DETERMINANTS OF FINANCIAL TECHNOLOGICAL INNOVATION ADOPTION BY CUSTOMERS OF DEPOSIT MONEY BANKS IN NIGERIA

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Determinants of Financial Technological Innovation Adoption by Customers of Deposit Money Banks in Nigeria

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A thesis submitted in partial fulfillment for the degree of Doctor of Philosophy in Finance in the Jomo Kenyatta University of Agriculture and Technology

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DECLARATION

This thesis is my original work and has not been presented for a degree in any other university.

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This thesis has been submitted for examination with our approval as University Supervisors,

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Dr. Patrick Ngumi

JKUAT, Kenya.

DEDICATION

This thesis is dedicated to my wife Christianah Mofoluwakemi for her love, support and encouragement during the entire duration of the course. Further dedication is to my parents late JamesOmotosho and late Caroline Olajumoke who taught me doggedness, discipline and value of hard work when I least knew the world. I also dedicate it to my children; Deborah Oluwabukunmi, Micheal Tolulope, Elizabeth Oluwabusola and Abigail Olufunmilola, the role model for whom I wish to be.

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ABBREVIATIONS AND ACRONYMS

ATM Automated Teller Machines

BCG Boston Consulting Group

BIS Bank of International Settlement

CAC Corporate Affairs Commission

CBN Central Bank of Nigeria

EFTPOS Electric Fund Transfer at Point of Sale

FINO Financial Innovation

INT Interest Rate

ICT Information and Communication Technology

NSE Nigerian Stock Exchange

PIN Personal Identification Number

SEC Security and Exchange Commission

TOE Technology Organization Environment

UNCTAD **U**nited Nations Conference on Trade and Development

UTAUT Unified theory of use and acceptance of technology

WEF World Economic Forum

DEFINITION OF KEY TERMS

Automated teller machine (ATM), also known as a Cash Point, Cash Machine, is a computerized telecommunications device that provides the clients of a financial institution with access to financial transactions in a public space without the need for a cashier, human clerk or bank teller (DeYoung, 2005).

Commercial bank/ Deposit Money Bank is a financial institution that provides services, such as accepting deposits, giving business loans and auto loans, mortgage lending, and basic investment products like savings accounts and certificates of deposit. Some commercial banks do not have any physical branches and require consumers to complete all transactions by phone or internet, in exchange, they charge lower fees. They are otherwise called financial intermediary, bridging financial gaps between borrowers and lenders.(Business Dictionary, 2011); (CBN,2008).

Electronic funds transfer is a system of transferring money from one bank account directly to another without any paper money changing hands (Barnes, 2003).

Financial incentives (FI) Theseare like carrots to entice or stimulate individual or organizational behavior to pursue a set goal or an encouragement for

	steadfastness in a pursuit to bring about desired result (Yang & Chin, 2010)
Fraud risk (FR)	Forgery, fraud and risk is a kind of deception deliberate or otherwise. Generally it brings about loss of one kind or another. It leads to devaluation or reduction in expected value as a result of sharp practices (Ovia, 2005).
Technology (ICT)	Is the technology required for information processing by making use of electronic mechanisms and computer software to convert, store, protect, transmit and retrieve information (NCC, 2007).
Innovation	Is the application of better solutions that meet new requirements, in anticipated needs, or existing market needs. This is accomplished through more effective products, processes, services, technologies, or ideas that are readily available to markets, governments and society (Boston Consulting Group, 2009).
Internet banking	is a system which allows individuals to perform banking activities via the internet (Bidmus, 2004).
Mobile banking	is performing banking transactions through a mobile device such as a mobile phone or Personal Digital Assistant (Boston Consulting Group, 2009).
Point of sale (POS) **terminal**	is a retail payment device which reads a customer's bank's name and account number

	when a bank card or credit card is swiped through a magnetic stripe reader. It contacts the bank and (if funds are available) transfers or withdraws the customer approved amount and prints a receipt (Business Dictionary, 2011).
Settlement	Any legally binding contract is based on consideration and consent, after which there could be exchange of documents and payment, especially after a successful commercial transaction between vendor and buyer (Sloan, 2003).
Transaction cost (TC)	This is the general cost implication associated with carrying out a process. It may include the real, switching and alternative forgone costs in order to bring about efficiency or value added (Iftekhar, Schmiedel & Song, 2009)
Turnaround time (TT):	This is generally observed time taken to be on a queue, served and get a transaction completed satisfactorily. Innovation will only be adopted if it saves time in bid to improve customers' service. (Domeher Frimpong, & Appiah, 2014)

ABSTRACT

Financial innovation as a banking system has been around for a while in Nigeria. It has improved the quality of banks' services and reduced the operational costs. However, despite gaining a lot of attention and its benefits, many consumers are still not willing to use it and there were few empirical studies on multiple financial innovations. Even few studies done in this area concentrated mainly on customers' perception of adoption and almost none on real quantitative factors. The purpose of this study was to investigate the determinants of financial innovation adoption by bank customers. The study hypothesized that, financial incentives, transaction cost, turnaround time and fraud risk affects the adoption of financial innovation in Nigeria. A mixed design research approach was used employing both primary and secondary data. Questionnaire was used to gather primary data. This was given to five hundred and thirty six respondents. All customers of the 21 listed banks in Nigeria constituted the target study population for this research. The study sample size was chosen by purposive and systemic sampling techniques, made up of the selected senior management staff, personal and corporate customers of the banks. The data collected was analysed with the aid of descriptive statistical techniques such as frequencies and percentages. Multinomial logit regression was used to identify the determinant factors and to test the hypotheses using Statistical Package of Social Sciences Version 21. Diagnostic tests result confirming Authenticity, Acceptability and Usability of the data collected, before been used even in the Pilot test and main study are as follows: Cronbach's Alpha Coefficient- Only coefficient above overall 0.74 – Accepted. On Principal Component Analysis, -Factor loading EFA >0.5 & KMO> 0.6 – Retained. Autocorrelation Test (Time Series Test) - Durbin Watson Test-2.024-No autocorrelation. Normality Tests –Shapiro-Wilk Test, p-value=0.066>0.05- H1 accepted- Normal Distribution. Heteroscedasticity – Chi^2 7.114, according to Breusch-Pagan Test-Accepted. Multicollinearity - For all independent variables, VIF<10; Tolerance Stat > 0.1- Used. There was evidence

of Good model fit- (Pseudo R^2) Values close to 1. Key findings from the study confirmed that, financial incentives have significant effect on the adoption of Internet Banking and Mobile Banking, but has no effect on Point of Sale terminals and Electronic Fund Transfer**.** The result concluded that fraud risk affects the adoption of all products of financial innovation. The result also confirmed that turnaround time is significant for the adoption of all financial innovation products Internet Banking. Transaction cost is generally significant on the financial innovation adoption of all products. Adoption of Automated Teller Machine is the most popular, followed by Point of Sales. It is expected that this study will assist in sharpening of strategic development focus in the banking industry. It amongst others recommended that Banks should reduce transaction cost, fraud and security risk, Intensify product promotion to stimulate customers' patronage and loyalty. Same study could be replicated for other financial institutions, or comparative analysis carried out on financial quantitative variables and customer's perception as determinant of financial innovation adoption in Nigeria.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Innovation is an important phenomenon in any modern economy and it allows firms to adopt a new and better process of performing their operations. In the financial service industry, innovation is viewed as the act of creating and popularizing new or reformed financial instruments, technologies, institutions and markets which facilitate access to information, trading and means of payment (Sloan, 2003). Innovation generally is critical for development of firms and individuals portraying new ideas, quality and convenience. According to Nofie (2011) innovation in the financial sector is the arrival of a new or better product and or process that lower the cost of producing existing financial services or transaction. Financial innovations are used by banks as formidable strategic variables to outstrip the competition and have become an essential means for the bank to improve its performance, growth and to maintain its effectiveness on the market (Batiz-Lazo & Woldesenbet, 2006). In a highly turbulent environment, a successful innovation, creating a unique competitive position can give a bank a competitive advantage and lead to a superior financial performance (Roberts &Amit, 2003).

Patronage and usage of financial innovation (adoption) is more determined by customer's acceptance than by the seller offerings. Customers will want to examine the level of their risk exposure, actual and implied transactional costs, the 'carrot' (financial incentives) and associated benefits attached to each financial innovation product before deciding to use it or not. In other words, fraud risks, financial incentivrs, turnaround time and transactional costs are taken into consideration before customers decide to adopt. In the view of Abubarka and Tasmin (2012), it was the issues of increasing demand to meet customers' expectation for customer service delivery, trustworthiness of the information system and competition in financial services that spur innovation revolution. Woldie, Hinson, Iddrisu & Boateng (2008) observed that it is one thing to

innovate, but entirely another for the innovation to be accepted by consumers. Customer dissatisfaction with branch banking because of long queuing and poor customer service is an important reason for the rapid movement to electronic delivery (Karjaluoto, Mattila & Pento, 2002). It is quite evident from these studies that enhancing innovation for qualitative prompt service delivery in the banking industry is a must in a rapidly changing market place.

However, in spite of the need for innovation and extensive descriptive literature on financial innovation, there is a paucity of empirical studies on actual and related quantitative financial issue on financial innovation adoption. Most of the existing empirical works have focused on the same handful perception view on financial innovations (Frame & White, 2004). This stimulated the interest in studying the relationship between financial innovations adoption and its determinants. A deeper understanding of the determinants of each type of financial innovation allowed researchers to better assess the impact of financial innovation on commercial bank's growth in Nigeria (Onaolapo, Salami, & Oyedokun, 2011).

World trade liberation and globalization have impacts on banking product development and improved qualitative service delivery. It spurred the development of various financial innovation and emerging financial instruments. There has been different type of innovations in the banking industry, such as securitization, derivatives, margin loans etc. None of these has far reaching implication in Nigeria, like technological innovation. Akamavi (2005) posits that innovation in the financial services sector was consequence of recent fundamental banking reforms which include: deregulation, recapitalization, proliferation, increasing competition and commercial growth all over the world.

Financial Innovation in this study is therefore defined as the use of technology to communicate instructions and receive information from a financial institution where an account is held. Financial innovation is the provision of banking services to customers through telecommunication technology (Ovia, 2005). This service includes the system that enables financial institution customers; individuals or business to access their

accounts, transact, or obtain information on financial products and services through a public or private network (Pradhah & Mishra, 2008). These facilities are mainly; ATM, POS, EFT, MB and IB. Currently, financial innovation in Nigeria has changed the way services are delivered by the banking sectors to their customers. It has lowered operating costs, improve customer service delivery, help to retain customer, reduce branch traffics, and downsize the number of branch staff (Parisa, 2006).The rapid pace of technological innovation coupled with merger and acquisition in the financial service industry brought about more sophisticated and more demanding customers (Adeoti, 2008). The wide spread of ICT gadgets, systems and process has enabled and underpinned the implementation and adoption of financial innovation products which prove timely for the National economic and financial development and market sophistication in Nigeria.

1.1.1 The Evolution of Financial Innovation

Financial innovation is the delivery channel for banking services. It refers to several types of services through which bank customers can request information and carry out most retail banking services via computer, (Idowu, 2013). Innovations play a crucial role in banking industry by creating value for banks and customers. It enables customers to perform banking transactions without visiting a brick and mortar banking system (Turban, 2008).Technological innovation in banking industry can be traced back to 1970, when the computerization of financial institutions gained momentum (Malak, 2007). However, a visible presence of this was evident to the customers from 1980s with the introduction of ATM. Innovative banking aided by developments in the telecommunications and information technology industry has grown since then. With further advancements in technology, banks were able to offer services, through PC owned and operated by costumers at their convenience, through the use of intranet propriety software (Lemo, 2005).

Financial innovation have led to a revolution in the way the bank business is conducted as found by Yin and Zhengzheng (2010) who showed the evidence that Chinese commercial banks have moved from the traditional business operation mode of the wholesale credit operations to the retail mode as a result of technological innovation. In

India, Pooja and Singh (2009) concluded that internet banks were larger, more profitable, had higher quality products and more efficient, compared to the non- internet banks. In Jordan, e- banking resulted in more satisfied customers and better long term cost savings strategies (Siam, 2006). Financial innovation has increased in importance in Ghana banks and has transformed the way banks serve their clients more conveniently (Joshua, 2010). Financial innovations are driven by improvement in computer and telecommunication technology and therefore for most people the creation of ATM was greater financial innovation than asset back securitization.

According to Yudirim and Philippato (2007), rivalry between banks, pushed the banks to engage in a differentiation process of the product they supply and this in turn stimulate innovations in Latin America. They also found that improvement in capital base stimulate competitiveness which improves the quality of differentiation and service delivery by introducing modern skills, management techniques and technology. The introduction and implementation of financial innovation into the two main banks of Mauritius was found to improve the performance of both Mauritius Commercial Bank and State Bank Mauritius (Padachi, Rojid & Seetanah, 2008). Banking institutions make immense contributions to the advancement and development of an economy especially through their fund mobilization and intermediation roles (Olaoye & Dada, 2014).

Commercial banks' capacity for resource allocation and smoothing of the payment system is considered so important that government in both developed and developing economies design special regulatory frameworks to control their activities, Soyibo (2002) and Oboh (2005). Prominent among such regulatory reforms in the Nigerian financial system were the deregulation and liberalization of the banking sector in 1986 as well as the recently concluded bank consolidation exercise of December 2005. Such reforms according to Soyibo (2002) have the potentialities for generating innovations, product development, new service packaging, institutional transformation and higher competitive practices among banks within the system. Competitive pressures have also brought out the needs for banks to know and understand their customers so well that the product or services created fit and makes them ready to buy (Onaolapo *et al,* 2011).

1.1.2 Nigerian Banking Sector

The Nigerian banking sector has witnessed remarkable changes, given the increasing wave of globalization, structural and technological changes and integration of financial market.The evolution of banking in Nigeria is divided into nine phases: (1)Thefree banking era (up to 1952) was characterized by absence of legislation and this resulted in a banking boom. (2) The pre-Central Banking era (1952-1959), commenced with the enactment of the banking ordinance in 1952. (3) The establishment of the Central Bank of Nigeria (CBN) in 1959 gave impetus to the era of banking legislation. (4) The era of indigenization (1970-1976) marked the indigenization of expatriate banks operating in the country. (5) The postOkigbo era (1977-1985) was the implementation of the recommendation of the Okigbo panel on the revival of the financialsystem. (6) The deregulation era (1986-1992), saw the privatization of government interest in various banks and the entry of more banks in the financial system. (7) The era of bank distress (1993-2001) saw the emergence of illiquid and terminally distressed banks in the system. (8) The era of universal banking (2002-2004) marked the commencement of universal banking in Nigeria.

Finally (9), the era of banks consolidation (2004- date). This was characterized by the consolidation of banks through mergers and acquisitions, repackaging of products, introductionnew financial instruments andmass embracement of financial technology innovation (Nzotta, 2004).The Central Bank of Nigeria (CBN) recent reforms to consolidate the banking sector through drastic increase of minimum capital base of any bank from 2.5 Billion Naira to 25Billion Naira, led to a remarkable reduction in the number of banks from 89 to 24 in 2005 and later from 24 to 21 banks in 2008.This changed the mode of operations and their contribution to national economic development (Soludo, 2008). The reform that was an attempt to solidify the banking industry by the Central Bank of Nigeria (CBN) was concluded on December 31, 2005. The primary objective of the banks consolidation (reform) was to guarantee an efficient and a sound financial system. The reform was designed to enable the banking sector develop the required capacity to support the economic development of the nation by

efficiently performing as the head of the financial intermediation and compete favorably with international banks (Lemo, 2005).

This last reform (consolidation), usher in the mass deployment of financialinnovation products and services (Adesina & Ayo, 2010).Reports on financial innovation system in Nigeria revealedthat; e-payment machinery is presently enjoying the highest popularity in Nigeria banking market. Meanwhile, Nigerian banks have made huge investments in telecommunication and electronic systems. This is because of the many advantages and importance of financial innovation. It is convenient, it is not bound by operational timings, there are no geographical barriers and the services can be offered at a minuscule cost (Adesina & Ayo, 2010). According to CBN, since recapitalization, there has been increase in deployment of technical devices, service and products in Nigerian banking industry owing to competition, growth in commerce, availability of fund and desire to satisfy customers' need (Ojo & Lawal, 2014).

Before the introduction of ICT and consequent proliferation of financial innovation products into the banking sector, the general operation was cumbersome and banks' performance was bad. Staff and customers spend endless hours in the banking halls to effect a simple transaction, therefore growth of the sector was stunted (Idowu, 2005). The use of ICT to enhance service delivery in the Nigerian banking system has now reached a remarkable level. ICT backed financial innovation products, services and devices are available everywhere, anywhere 24/7 (CBN, 2007). The adoption of relevant technologies facilitates the enhancement and modernization of the payment systems, allows greater mobility and flexibility in the capital and finance movement as well as data transfer flows. In addition, financial innovations increased the pace of economic transactions, and enhance business practice. In other words, financial innovation aids prompt decisions and actions which influence increased operational efficiency, performance and productivity (Bamidele, 2006).

Financial innovationin Nigeria banks started in 1982 with Societte Generale Bank (a foreign, French bank) who installed an ATM machine. Soon the credit and debit cards

followed in 1985 (Idowu, 2005). What we now have in all Nigeriabanks is proliferation of financialinnovation products and services. Banks have acquired and imbibe technology culture for competition and relevance in the global financial market. The Bassel Accord supports this. The Federal Government of Nigeria in consortium with the CBN in support of these innovative ideas rolled out its Electronic Banking policy guidelines in 2003 and Cashless policy in 2011, which among other things is: toregulate financial and monetary policies and encourage financial deepening and inclusion. Billions of Naira had been invested on technological hard and software programs by the government, banks and the private sector to aid and bring financial innovation to customers' doorstep (CBN, 2011).

However, things are far from being settled as forms, reengineering, innovative strategies for cooping and better performance of the banking sector are unfolding by day, leading to acquisition offinancial innovative devices and products to enhance service delivery and cope with the volume of activities and operations (Idowu, 2013). Innovation is at the centre of global change curve. The Basel accord supported financial intermediation dynamism through strong and competent supervisory structures,appropriate capital adequacy and essential information technological (innovation) content (Basel Committee, 2001).Many companies in the financial services sector have been quick to implement telecommunication capabilitiesas electronic service is becoming a viable option for interaction between financial service providers and their customers (Rotchanakitumnuai & Speece, 2004).

Nigerian like most other developed countries is not alone in the quest for commercial and financial services development or technology content advancement. Countries such as United State, United Kingdom, and Japan are at the forefront, even South Africa. It has assisted their economic growth (Lagace, 2003). This development,boost the provision of qualitative financial service delivery in developed countries and improves the banking sector performance.Clearly, in order to encourage consumer financialinnovation adoption in Nigeria, banks must make key improvements decisions

that address consumer concerns. Thus, it will behoove financial institutions to gain an understanding of the key factors that influence consumer financial innovation adoption.

With effect from 1st January, 2012, the CBN commenced the implementation of the 'Cashless policy' aimed at driving development and modernization of the country's payment system in line with Nigeria's vision 2020 goal of being amongst the top 20 economies in the world by the year 2020. It is also believed that an efficient and modern payment system is positively correlated with economic development, and is a key enabler for economic growth. To ensure the success of this policy, all banks are expected to deliver financial technology innovation channels and encourage customers to use same (CBN, 2011). From the foregoing, it is clear that the success of a policy like this depends to a large extent on the ability of banks to deliver alternative banking options to customers and the rate at which customers adopt and embrace such options. According to statistics, 30% of the adult population (25.4 million people) of Nigeria has at least one bank account while 56.9 million adults are unbanked (UNCTAD, 2009).This connotes a wide market. Now that virtually all 21 banks in Nigeria today offer banking services based on financial technology innovation platforms, there is need to determine what influence the pace and rate of usage and patronage of each product by the customers and other stakeholders and how to improve it.

1.2 Statement of the Problem

The fast-changing competitive environment, globalization, economic changes, regulation, privatization and the likes, demand that commercial banks are run efficiently and effectively by continuously engaging in financial innovations (Auta, 2010). In Nigeria, emergence of new technologies, products, processes, markets and competition places demand on any deposit money bank to apply skills and technology necessary to remain competitive and achieve competitive advantage, by winning more customers while retaining old ones.Though it is undeniable that innovation is important in expanding financial inclusion and deepening (Bamidele, 2006), the customers seems not to be enthusiastic about using it therefore, the level and rate of financial innovation

adoption has not being encouraging in Nigeria, very low (Agboola, 2006), despite various financial incentives to entice old customers and attract new customers to embrace and use financial innovation thereby causing low financial returns, poor growth rate and concern in academic, finance, commerce and economic circles.

In Nigeria, long lines, transaction errors, queuing, insecurity and network failures have been said to be the most frequent problems in using innovative banking services and consequent associated loss of time and money constitute fraud and security risk. This highly lower customer's perception on the quality of service offered and hence reduces the customers' patronage and financial innovations adoption (Onaolapo, Salami & Oyedokum, 2011). It is obvious that many consumers are not willing to use innovative banking services in spite of the banks' investments and efforts in this domain. This has made it clear to some researchers like Lawrence (2010) and Agbemabiese, Patrick and Joseph (2015) that recognizing effective factors on adoption and usage of these products is really important, to strategize for bailout, justify huge resources committed and guarantee growth of the banks. In order to encourage further financial innovation adoption in developing countries, a better understanding of the barriers and drivers of financial innovation adoption is crucial (Zhao, 2008). By gaining an in-depth understanding of the factors and conditions that influence developing country's ability to fully adopt and realize its benefits, strategic options can be generated for the researchers and practitioners regarding how to promote the growth of banks and financial innovation in the developing countries.

Also despite the recognized importance of financial innovations and an extensive descriptive literature, there have been surprisingly few empirical studies in Nigeria. This situation has denied the banks the much needed information (Soludo, 2008). According to Ndlovu and Siyavora (2014), financial innovation has had a positive impact on bank efficiency but its magnitude of adoption by users has been relatively low, denying banks of good timely returns on their investment. While financial innovation services are numerous in number, there is not enough evidence of consumer acceptance and their stance towards the adoption of the services (Muniruddeen, 2007). In order to accept that

financial innovation has fully gained prominence in Nigeria, customer's acceptance, confidence and adoption of the system need to be empirically validated. This study therefore intends to determine drivers and barriers of financial innovations so that appropriate remedial action could be taken where needed to boost financial innovation adoption that is currently considered at lower ebb among the customers of Deposit Money Banks in Nigeria.

1.3. Objectives of study

1.3.1 General objective

The general objective of this study was to establish the determinants of financial innovation adoption by customers in Deposit Money Banks in Nigeria.

1.3.2 Specific objectives

In furtherance to the general objective and based on the effort of banks to entice, retain new and old customers respectively by improving on customer service delivery, the study looked into the following related specific objectives;

1. To determine effect of financial incentives on financial innovation adoption in Deposit money Banks in Nigeria.
2. To explore the extent to which fraud risk affect financial innovation adoption in Deposit Money Banks in Nigeria.
3. To determine the effect of turnaround time on financial innovation adoption in Deposit Money Banks in Nigeria.
4. To appraise influence of transaction cost on financial innovation adoption in Deposit Money Banks in Nigeria.

1.4 Research Hypotheses

In order to address the above objectives, the following hypotheses to determine the factors that influence customers' financial innovation adoption were tested.

Ho: Financial incentives have no significant effect on financial innovation adoption.

Ho: Fraud risk has no significant effect on financial innovation adoption.

Ho: Turnaround time has no significant influence financial innovation adoption.

Ho: Transaction cost has no significant effect on financial innovation adoption.

1.5 Justification of the Study

The research work becomes important in view of the recent trend in global financial sector where technology culture is in vogue and various governments are embarking on financial reformative processes. The study appraised the patronage and utilization of financial innovation in Nigeria Deposit Money Banks within the last 10 years by the customers. This becomes important in view of the government involvement and interest in financial deepening and inclusion; more so the level of resources commitment by banks to enhance customers' satisfaction, sharpen their competitive edge and the growth of e-commerce that is dwindling (Agboola, 2006; Soludo, 2008; Onaolapo, *et al,* 2011.*).* The study is also relevant to the following stakeholders; Researchers, Practitioners and Policy makers.

This study will help the government of Nigeria as it seeks to leverage on technology togrow the financial services sector, enhance financial access and inclusion.Banks are swiftly becoming more aware of the importance of customers' stand in this era and in a bid to improve the level of adoption, the study findings will inform banks on strategies to improve customers' patronage and deposit base, It is expected that this study will also help to expand knowledge, awareness and understanding of financial innovation in the

banking industry strategic development for proper Corporate Financial Planning and IT strategy, which are necessary cornerstones for adequate and workable theories, practices and policies in financial sector.

Similar work but concentrating on different parameter had been carried out in Kenya (Ngumi, 2013), looking at output end i.e. consequence - performance. This work looked at input end, the causality, i. e. the determinants of financial innovation adoption. The study is value added to the existing body of knowledge and it recommended ways for improvement of customers' satisfaction and financial innovations adoption.

1.6 Scope of the Study

The study covered the 21 recapitalized deposit money banks licensed by the Central Bank of Nigeria, and their customers. The commercial banks that formed the units of analysis of the study were those that were in operation by close of business of 31st December 2014.Thefinancial innovations focused in the study were, automated teller machines, point of sale terminals, mobile banking, internet banking and electronic funds transfer. The risks, incentives, costs and benefits that informed customers' decision to adopt it and use it or otherwise as means of dealing with the bank were considered. This was because of the Nigerian government decision to leverage on technology to develop the financial system (Soludo, 2008). But it has been discovered that so many factors are hindering this move among which is fraud (Olaoye & Dada, 2014). Moreso Agboola (2006) opined that the level of adoption is low, where as Muniruddeen (2007), contended that there is no enough evidence of customers' acceptance and their stance towards financial innovation adoption. Data collection was for period between 2005-2014. The study utilized both primary and secondary data. The area of concentration was Lagos where the head offices of most of these banks were located and which is also the hub of commercial and business activities in Nigeria. But the work covers the whole nation. Some senior bank staff and customers were sampled for views and opinionon financial innovationsadoption by the customers in the banking industry in order to identify the area that needs strengthening or overhauling.

HAPTER TWO

LITERATURE REVIEW

2.1 Introduction

In this section the researcher reviewed relevant literature on theoretical, empirical and conceptual framework issues which are found to be essential to the adoption of financial innovation. This chapter also reviewed the literature related to the key study variables as presented in the conceptual framework. Empirical studies related to the study variables were considered in order to lay solid foundation for the research. In the final analysis the chapter gave a brief summary of some of the related previous work on this study. In the context of this study, financial innovation is the totality of multi-channel service provided through financial technology. Financial innovation is borne on the acquisition and utilization of ICT to enhance the operations, activities and performance of Nigerian deposit money banks.

2.2 Theoretical Framework

Theories provide a generalized explanation to an occurrence. Therefore a researcher should be conversant with those theories applicable to his area of research (Kombo & Tromp, 2009; Smyth, 2004). According to Muiruri and Ngari (2014) a theoretical framework guides research, determining what variables to measure, and what statistical relationships to look for in the context of the problems under study. Thus, the theoretical literature helps the researcher to see clearly the variables of the study; provides a general framework for data analysis; and helps in the selection of applicable research design.Theories and models on innovation adoption which informed this study are; Theory of innovation, Innovation diffusion theory, Transaction cost innovation theory, Fraud triangle theory and Rational choice theory.These theories informed the source of the variables of the study and the interactions between the dependent and independent variables.

2.2.1 Schumpeter Theory of Innovation

Schumpeter drew a clear distinction between the entrepreneurs whose innovations createthe conditions for profitable new enterprises and the bankers who create fund to financethe construction of the new ventures (Schumpeter, 1928). He emphasized heavily that the specialrole of credit-creation by bankers was 'the monetary complement of innovations' (Schumpeter, 1939). As independent agents who have no proprietary interest in the newenterprises they finance, Bankers are the capitalists who bear all the risks (none is borneby the entrepreneurs). They require having the special ability to judge the potential for success in financing entrepreneurial activities. His propositions particularly interesting allusion to innovations in the bankingsector is found in Schumpeter's discussion of the banking acts of the 1930s. He statedthat the 1933 Act in America introduced important reforms whichincluded the strengthening of the Federal Reserve's power to regulate member banks'extension of credit for speculative purposes and the separation of commercial banks andtheir security affiliates.

Innovation is more than simply coming up with good ideas; it is the process of growing their practical use. In other words, innovation is defined as the use of new knowledge to offer a new product or service that customers demand (Dew, 2007). Financial innovation is the core of the strategic transformation of commercial banks. Schumpeter (1939) classified it into two major categories: product and service innovations. Product innovations comprise of the creation of a new good which more adequately satisfies existing or previously satisfied needs. Product innovations also include the creation of completely new products, which provides a monopoly position to the innovator.

Schumpeter's assertions have been supported by Porter (1992) that innovation is vital for a country's long-run economic growth and competitive advantage. Porter (1992) argues that to compete effectively in international markets, a nation's businesses must continuously innovate and upgrade their competitive advantages. Innovation and upgrading come from sustained investment in physical as well as intangible assets. Financial markets play critical roles in mobilizing savings, evaluating projects,

managing risk, monitoring fund movements and facilitating transactions. From this theory, financial innovation by banks is a strategic choice to boost performance, enhance relevance and competition. Therefore banks must be constantly alive to the desire of the market and move to position its customers in vantage point economically. This means banks must be mindful of what customers need, marry it to what they want andalso innovate as appropriate, at a gain.

2.2.2 Innovation Diffusion Theory

According to Rogers (2003), the factors which influence the diffusion of an innovation include; relative advantage (the extent to which a technology offers improvements over currently available tools), compatibility (its consistency with social practices and norms among its users), complexity (its ease of use or learning), trialability (the opportunity to try an innovation before committing to use it), and observability (the extent to which the technology's outputs and its gains are clear to see). These elements are not mutually exclusive thus unable to predict either the extent or the rate of innovation diffusion or adoption.

Rogers' theory does not tell us whether the system states of organizations need to be in normal operating mode in order for the theory to apply or whether the theory holds in all types of organizations or only in certain types. Specifically, the theory begins to describe the innovation-decision process within organizations but not to the level of addressing whether and how the characteristics of an innovation interact to affect its adoption within organizations, or whether organizational type, size or industry affect adoption.

Anyasi and Otubu (2009) defined diffusion as the process of communicating an innovation through certain channels over a certain period of time among the group of a social system. They also define the communication as a process where people create and share information among one another to reach a mutual understanding. Porteous (2006), argued that there are four stages in innovation diffusion process; invention, diffusion (or communication) through the social system, time and consequences. The ease of use and newness (in terms of persuasion, knowledge and the decision to adopt) of an innovation

can determine the way an individual will respond to an innovation.It is believed that, an innovation with relative advantage, with less complexity and saving costs will be adopted easily and faster by an individual.

IT diffusion, involves more than acquiring computers and microelectronics based gadgets and related know-how. It involves preparedness and development of technical change-generating capability to adopt given technology to diverse needs. In advanced market economies, where large volume and value of goods are traded, the modern banking system provides an efficient payment mechanism for settlement of claims through banks. Access into a globalised economy would only be through IT inputs (personal computer, internet, email, and others), provided there is enabling facilities and constant power supply. Companies are now in a better position to respond speedily to change in demand patterns and change in international comparative advantages, courtesy of telecommunication technology (Bamidele, 2006).

According to this theory, for financial innovation adoption, there is need for awareness by the customers. Banks must undertake and conduct public enlightenment on the availability, benefits and features of various financial innovations regularly. Therefore innovation without communication, coordination and understanding may be problematic, time waster and useless as it is not likely to achieve much either for the banks or the customers. There must be timely information and communication. This leads to time consciousness and reduction in response time, which influence the turnaround time.

2.2.3 Transaction Cost Innovation Theory (TCT)

The transaction cost innovation theory pioneered by Hicks and Niehans in 1983, advocated that the dominant factor of financial innovation is the reduction of transaction cost, and that financial innovation is the response of the advance in technology which caused the transaction cost to reduce. Transaction costs play an important role with respect to innovation. In this case, the theory explains its relationship to other aspect of commerce development, that the primary reason of financial innovation in financial

institutions is profit maximization. Hick and Niehans (1983) argued that the reduction of transaction cost can stimulate financial innovation adoption and subsequently improvement of financial services.

The theory studied the financial innovation from the perspective of microscopic economic structure change. The theory's motive further explained another perspective relative to the radical motive of financial innovation of firms' purpose of earning/increasing shareholders' wealth or benefits. Transaction costs Innovation theory is also relevant in this context: for instance, the use of Internet-connected Information Technology (IT) can substantially reduce a firm's transaction costs as it enables efficient coordination, management and use of information. Mobile, Internet-connected IT may further lower transaction costs as it provides also off-site access to the firm's internal database and other relevant sources of information.

Efficiency in TCT is conceptualized as Pareto efficiency where governance modes are comparedaccording to their ability to facilitate transactions until the point at which itis impossible to make one party better off without making the other party worse off (Jones, 1998). TCT claims that thefirm, in many cases, providesa relatively more efficient method of organizing relative to the market because of optimization of transaction costs or overall value. Therefore, TCT is about efficiency and views economic organization as being principally concerned with the relative efficiency of optimizing on transaction costs. TCT rests upon several key assumptions about human behavior and environmental characteristics (Williamson, 1985). These assumptions elucidate why firms may face superior costs for market-based transactions and why firms may be relatively more efficient than markets at organizing transactions. The firmwill select the governance form, from the various alternatives amongst the organizational menu, that minimizes transaction and production costs. In neoclassical economics, humans are viewed as self-interested; individuals pursue their own self-interest in their own activities (Williamson, 1985).

The opportunism assumption is about the motivations of human behavior (Williamson, 1985). This assumption is central to TCT because, in the absence of potentially opportunistic behaviors, contracts would be costlessly enforced and there would be no reason for other forms of economic organization besides the market. More often in nature value and benefits are weighed against its cost. Where cost is greater than the two, the rational human behavior is to abandon except it is absolutely necessary. Therefore cost of transaction must be monitored and controlled if financial innovation would be embraced and adopted by the customers. Importance of this theory boils than to the fact that customers are often cost conscious and before embracing any new development or adopt it, they are likely to have considered all associated costs and do cost and benefit analysis to determine whether it worth their while.

2.2.4 Fraud Triangle Theory

Fraud is one of inherent risks in banking often perpetuated by customers, staff, even management staff. Fraud in bank could be internally or externally carried out or by collaboration of both forces. Event has proved that some factors aid perpetuation of fraud, especially in this information age. The facelessness, boundarilessness, and no wavelength policing characteristics of technology made it susceptible to fraudulent practices. An American criminologist named Cressey Donald in 1950s developed the Fraud Triangle Theory Model where he explained that in most incidences of fraud some common three factors are always present: perceived financial needs (greed- motivation), perceived opportunity and rationalization/justification.There is also the Diamond theory proposed by Wolfe and Hermanson (2004) that added fourth dimension to fraud theory. This is capability factor. The most essential fraud ingredients common to both models are greed, opportunity and exploitation.

According to a survey carried out by Hayward (2007), it was found that greed constitute the main cause of fraud, responsible for about 65% of the cases. In term of opportunity, it was found out that fraud thrives where internal control is weak, poor security system and little chance of detection or immediate apprehension. To some people fraud is seen as being smart and this is their justification. These are quite evident in some of the

character trait of fraudsters where trait such as ego, illusion, positioning and intelligence abound. The menace of faceless looters who exploit open opportunities, constitute fraud risk in the adoption of technologically based banking operation such as financial innovation. Therefore understanding, recognising and tightening the loopholes for security and fraud risks will be a step in the right direction towards encouraging financial innovation adoption.

2.2.5 Rational Theory of Choice (RTC)

The rationality described by rational choice theory is different from the colloquial and most philosophical use of the word. Typically rationality means sane, or thoughtful, clear headed manner. Rational choice theory uses a specific and narrower definition of rationality simply to mean an individual act of balancing cost against benefit to arrive at action that maximizes personal advantage (Friedman, 1953). Rationality under modern theory of choice is considerably narrower than its name might suggest, it mandates just a consistent ranking of choice alternatives. In rational choice theory, all decisions crazy or sane are postulated as mimicking such a rational process. Thus rationality is seen as a property of patterns of choices rather than of individual choices.

Rational choice theory is at the heart of modern economic theory and in the disciplines contiguous to economics, such as some parts of political science, decision theory, sociology, history and law that have adopted the theory as their model of decision making.There is no widely accepted definition of rational choice theory, but there are two important senses in which the term is used. The first is an informal sense: choice is said to be rational when it is deliberative and consistent. The decision maker has thought about what he or she will do and can give a reasoned justification for the choice.That is, one expects that there will be no wild and inexplicable swings in the objects of their choices and that the means chosento effectuate the goals of the decision maker will be reasonably well-suited to the attainment of those goals (Nozick, 1993). Like many informal definitions this one is highly imprecise.

The second sense in which the professionals use rational choice is more formal: have transitive preferences and seek to maximize the utility that they derive from consumers those preferences, subject to various constraints. Transitive preferences are those for which, if some good or bundle of goods denoted *A* is preferred to another good or bundle of goods denoted *B* and *B* is preferred to a third good or bundle of goods denoted *C*, then it must be the case that *A* is preferred to *C*. By contrast, if it were the case that *A* were preferred to *B*, *B* were preferred to *C* and *C* were preferred to *A*, this would be distinctly odd - indeed, irrational, Hodgson(2015). Similarly unobjectionable is the assumption that the decision maker seeks to maximize utility subject to various constraints (such as those imposed by income, time, cognitive resources and the like). Most economists identify with more formal sense than informal mode of rational choice theory.

Most idealistic models have assumptions. The proponents of rational choice theory models do not claim that a model's assumptions are a full description of reality, only that good or bad models can aid reasoning and provide help in formulating falsifiable hypothesis, whether intuitive or not. In view of this, the only way to judge the success of a hypothesis is empirical test (Friedman, 1953). Personal rationality should not be seen as an egotistical good, but rather a utilitarianistic one under certain circumstances.The basic idea of rational choice theory is that pattern of behavior in societies reflect the choices made by individuals as they try to maximize their benefits and minimize their costs. In other words, people make decisions about how they should act by comparing the costs and benefits of different courses of action.

The idea of rational choice, where people compare the costs and benefits of certain actions is easy to see in economic theory. Since people want to get most useful products at the lowest price, they will judge the benefit of a certain object by comparing it to a similar object. They will compare benefits, price, or costs. In general people will choose the object that provides greatest reward at the lowest cost. This behavioral pattern is also traceable in financial innovation adoption. There are many platforms and channels of financial innovation products and services open to customers. They all have their peculiarities and features which entice and appeal to different types and segments of

customers according to their needs. The importance of this,based on rational choice theory is that Banks must know that they cannot just force or market any financial innovation product or service to the customers. The right of choiceor rejection belongs to these customers.

2.3 Conceptual Framework

A conceptual framework is a set of broad ideas and principles taken from relevant fields of enquiry and used to structure a subsequent presentation (Kombo & Tromp, 2009). A conceptual framework is a research tool intended to assist a researcher to develop awareness and understanding of the situation under scrutiny and to communicate it. When clearly articulated, a conceptual framework has potential usefulness as a tool to assist a researcher to make meaning of subsequent findings. It forms part of the agenda for negotiation to be scrutinized, tested, reviewed and reformed as a result of investigation and it explains the possible connections between the variables (Smyth, 2004). Unlike theory, a concept is an abstract or general idea inferred or deduced from specific instance therefore it does not need to be discussed to be understood.The model we developed proposed that financial innovation adoption can be modeled with the variables derived from literature. The relationship between dependent variable i.e. financial innovation adoption(customer base, deposit base and instruments/channels) and four independent variables namely; financial incentives, fraud risk, transaction cost, turnaround time, as shown in Figure 2.3 were examined.

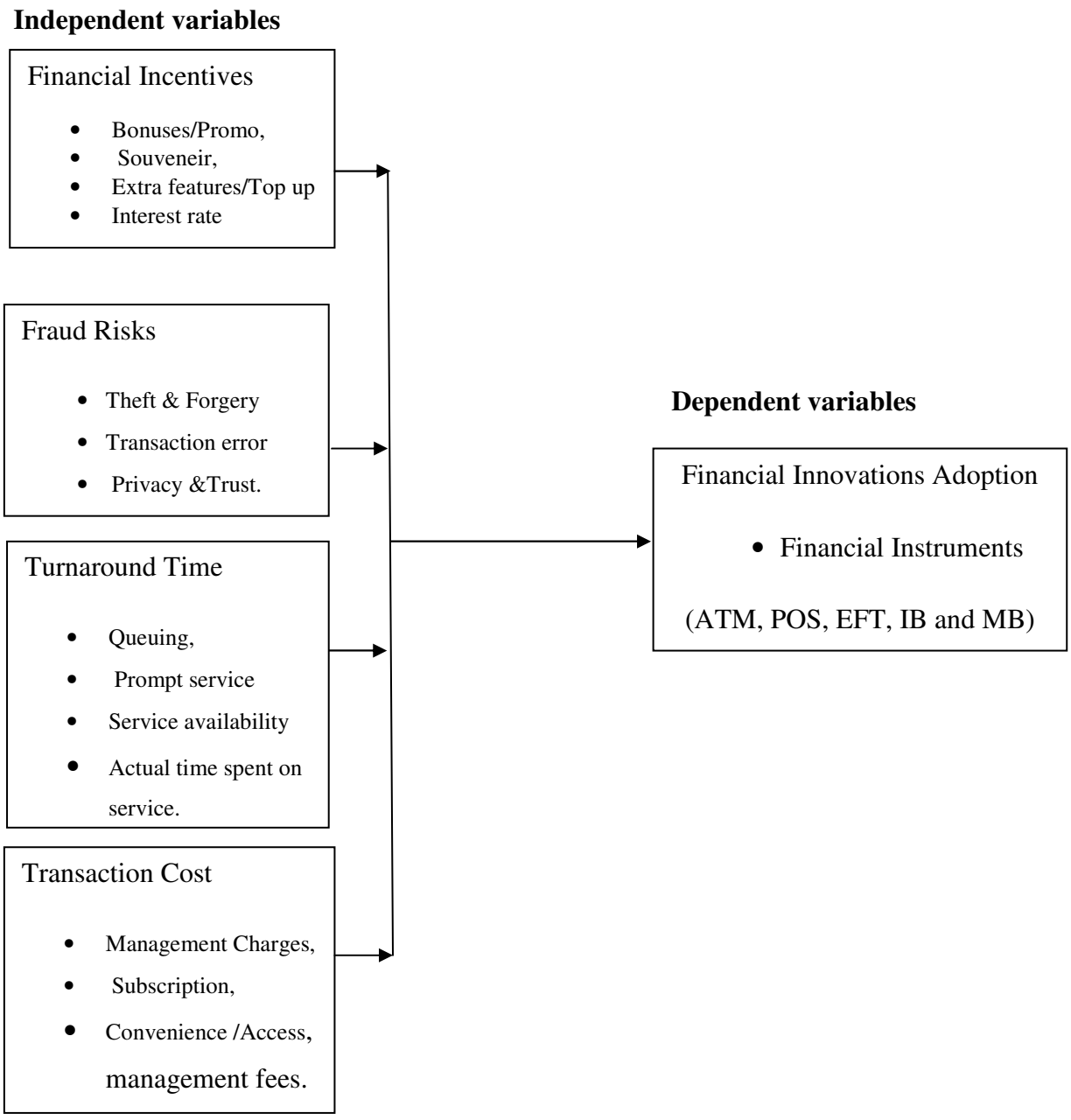

Figure 2.3 Conceptual Framework

2.4 Empirical Review

Empirical literature review is a directed search of published works, including periodicals and books, that discusses theory and presents empirical results that are relevant to the topic at hand (Zikmund Babin, Carr & Griffin, 2010). Literature review is a comprehensive survey of previous inquiries related to a research question. Through the use of a systematic approach to previous scholarship, literature review allows a researcher to place his or her research into an intellectual and historical context. In other words, literature review helps the author to declare why their research matters (Kaifeng & Miller, 2008). There is a need to consider the work and efforts of the earlier scholar in the area of study, review their focus, method, result and contributions so as to provide a solid base for the investigation and finding of this study on financial innovation adoption. Financial innovation adoption is the patronage and usage of modern banking technology instruments to transact business between customers and banks.

Financial innovation – (Channels and Instruments) are non-paper computer-based technology payments instruments. Banks have come to realize that to become relevant in global financial issues they must embrace technology, package products in manners acceptable to customers and use it as competition strategy for their core competence. Use of Point of Sale Terminals, Electronic Fund Transfer, Internet Banking, Automated Teller Machine, Telephone Banking and Personal Computer Banking are the major products of Financial Innovation (Electronic Banking) in Nigeria (Idowu, 2013).

According to Nyangosi and Arora (2011), financial institutions adopted different electronic distribution channels to provide quality service delivery to their customers. In their study examining the adoption of information technology in Kenyan banks, focusing on services provided through internet and mobile banking, they found out that inclusion of information technology in banking business was necessary to achieve excellence goal and win customers. Mohammed *et al.,* (2009) assert that financial innovative banking uses the internet as the delivery channel by which to conduct banking activity, for example, transferring funds, paying bills, viewing checking and savings account balances, paying mortgages and purchasing financial instruments and certificates of

deposits. The commitment of senior management is an essential driving force in the exploitation and adoption of technologically based innovation (Shiels, Mcivor & O'reilly, 2003). This is why banks have invested heavily in financial technology innovation due to their cost advantages on a per-transaction basis, where it's less than teller or telephone or human operator.

However, Customers are often mindful of transaction cost, fraud risk, turnaround time, financial incentives and benefits, before committing themselves to meaningful adoption of specific financial innovation. Customers prefer to deposit money into a system in which they can obtain a good timely information and payment service (Kemppainen, 2008). The highest fear of customers about innovative banking is that of insecurity, next is cost and incompatibility. The larger the financial innovation adoption rate, the larger the customer base, the greater the customer base, the larger the deposit base (Auta, 2010).

2.4.2 Financial Incentive

Innovations of retail payment services have a larger impact on bank performance in countries with a relatively high adoption of retail payment transaction technologies (Iftekhar, Schmiedel & Song, 2009). Advanced retail payment transaction technologies have fostered innovation and growth in the retail banking sector. This further created more value associated with retail payment services for banks. As more retail payment transactions are done through ATMs or POS instead of retail payments offices, banks can be more cost efficient and obtain more income. If the eras of traditional banking are compared to the present financial technology eras, the results show that financial innovation has contributed positively, and increased the profits of banks (Ngumi, 2013). Banks are gradually transitioning from manual means to the electronic means. Efficiency has risen, though cost of labour has increased, but generallycosts have been reduced; while provision of services, time saved, accuracy, reliability and quality of services has improved (Bamidele, 2006).

There is there fore the need to market and to entice, retain and win more customers and secure their loyalty (Yu, 2012). This is what brought about the use of various modes of

incentives to encourage loyalty, entice and stimulate customers' interest, to patronize and use (adoption) financial innovation for their banking transactions. For example payment of a higher interest rate would make it more costly to hold cash in hands, thus giving people more incentives to adopt financial innovation and save. According to Yang and Chin, (2012), a one-percentage-point increase in interest rate would induce 12.6% more non-adopters to adopt ATM cards, and a two-percentage point increase would make an additional 23.3% of non-adopters decide to adopt. It is important to highlight a public/monetary policy implication of this experiment. When the Central Bank raises the interest rate, it would not only give all customers stronger incentives to save, but also increase the number of ATM card holders. The increase in savings for the new ATM card adopters would be even higher thereby shoving up the Deposit base.

From the work of Yang and Chin (2012), the effect of sign-up bonuses show the impact of different amounts of sign-up bonuses on the percentage of new adopters and the overall cumulative adoption rate, respectively. It appears that a sign-up bonus targeted at 50 years age group could be very effective: a €10 sign-up bonus to consumers in this group can increase the average percentage of new adopters to 19.4%; a €20 sign-up bonus can increase it to 26.0%; a €50 sign-up bonus can increase it to 55.0%. From the bank's point of view, this appears to be an effective marketing strategy. By converting more senior citizens into ATM users, banks could hire fewer human tellers. This allows them to cut the costs of providing financial services.

Even in Sierzchula *et al.,* (2014) work in Netherland, in order to encourage Electric Vehicle (EV) adoption, countries have used financial incentives from both technology specific policies, such as subsidies to EV consumers, and technology neutral policies, such as emissions-based vehicle taxes. These were applied either at the time of a vehicle's registration or on its annual circulation fee (license fees in the US). Some countries such as Norway and Estonia matched high financial incentives with increased EV adoption. However, this relationship was not uniform as other countries, including Denmark and Belgium, offered high financial incentives but had relatively low levels of

adoption. This suggests that there are additional factors other than financial incentives that drive EV innovation adoption even financial innovation adoption.

2.4.3 Fraud Risk

The customer's intention to use an innovation can be influenced by security risks as this can create opportunities for fraudsters. In a study by *Australia Banking and Finance* (1997), it was found that security concerns are keeping both consumers and bankers away from financial innovation. Booz and Hamilton (1997), reveals that security concern among customers was the top ranking obstacle for non-adoption of financial innovation in Latin America. Perceptions of risk are a powerful explanatory factor in consumer behavior as individuals appear to be more motivated to avoid mistakes than to maximize benefits. Fraud is commonly understood as dishonesty, a deception deliberately practiced in order to secure unfair or unlawful gain. Fraud in the context of financial innovation is the unintentional (operational error) and deliberate action undertaken by players in the financial services leading to cheating or deriving unlawful gains and/or denying other players of their legitimate resources (Olaoye & Dada, 2014).

In the banking system especially as regards the proliferation of innovative products, fraud had been on the increase because of security compromise and unethical behavior of some individuals who exploit operational and process loopholes to defraud banks and unsuspecting customers.These are risks in the banking innovative system (Soludo, 2008). Financial innovation adoption should be enhanced by reducing the level of fraud risk (Ovia, 2005). Owing to the open internet technology and lack of sufficient local and international laws concerning e-finance activities, the trust and trust related-concepts (that is risk, credibility, image and reputation) have to be integratedinto models explaining financial innovation adoption behavior. The upside linked to the implementation of internet banking is that carrying out transactions with the bank becomes more convenient. The downside is that internet banking may open the door for identity theft and other forms of malfeasant behaviour that sometimes characterize e-banking transactions. According to the Bassel Accord (2001), operational, legal, reputational and transaction risks add to the total risk profile of the bank.

According to Kondabagil (2007) security is a major problem facing customers whenever they make online transaction. In a study conducted on internet users by Zhou, Lu and Wang (2010), it was found that 81% of users are concerned about privacy when they are online. In another research conducted by Besavros (2000) it was found that, consumers are always reluctant to share their information online due to fear that their financial life will be open to the internet universe. Gaining the confidence of customers is of paramount important to service providers and if not well managed could discourage users and could encourage negative spread of information which could pull back intending customer. Customers' security is one of the very important factors in determining the decision of consumer to use financial innovation. Cooper, (1997) identifies the level of risk as an important characteristic from a consumer's perspective in financial innovation adoption.

A descriptive case study analysis was conducted by Khalfan *et al.,* (2006), on factors influencing the adoption of internet banking in Oman. Data used in their study were collected using semi structured interviews and survey questionnaire as well as reviewing some bank documents. The results of their study provide a pragmatic picture about the adoption of e-commerce applications in the core financial sector domain of Oman. One of the main findings was that security and data confidentiality issues have been a major barrier (fraud risk). This was the view also taken by Olatokun and Bankole (2011), on similar study in Nigeria and Bultum (2014), in Ethopia.

Key fraud enablers in financial innovation services are: Weak regulation, Maturity of the Financial system,Processes Compliance monitoring, Consumer awareness, Poor communication within the system, High cost of transactions, Pricing policies, Cultural issues and Seasonality (Olaoye & Dada, 2014). Also occurrence of fraud depends on the stage of the deployment of financial services. In India according to Assocham PWC Report (2015), technology has become the biggest driver of change in the financial services sector. Most financial institutions are therefore insisting on cashless and paperless transactions. The new technologies adopted by financial institutions are

making them increasingly vulnerable to various risks such as phishing, identity theft, card skimming, social engineering, website cloning and cyber stalking.

According to Assocham PWC Report (2015), from the Republic Bank of India (RBI) records, 22 million of the 589 million bank account-holders use banking innovation applications and the volume of mobile banking transactions has risen from around 18,190 million INR in 2011–12 to approximately 1,018,510 million INR in 2014–15. The value of financial innovation fraud rose from 350000 billion INR in 2012 to 800000 billion INR in 2015. Around 65% of the total fraud cases reported by banks were technology-related frauds (covering frauds committed through an internet banking channel, ATMs and other payment channels like credit/debit/prepaid cards). In Nigeria according to Olaoye and Dada (2014), level of fraud in the banking industry rose from N13000million in 2002 to N222000million in 2012. Of these frauds, 75-80% is financial technology innovation based. Apparently financial innovation may not be fully adopted in Nigeria, until it is considered safe and secured by the customers. Nobody rational will want to invest in an environment latent with risks and frauds.

2.4.4 Turnaround Time

Customers are more likely to identify and adopt innovation that would be free of physical and mental effort. Effort is a finite resource that a person may allocate to the various activities for which he or she is responsible (Rotchanakitumnuai & Speece, 2003). Financial innovation aside that it is the most cost-efficient technological means offinancial transaction, it eliminates the barriers of distance / time and provides continual productivity for the bank and customers, no matter the distance since it is accessible on a 24 hour basis (Poon, 2007).

In Ghana, many bank customers including companies do not accept cheques as a payment method Domeher *et al.*, (2014). This is because of the time and the inconveniences involved in accepting and depositing cheques in company accounts, accordingly they foretold that if the present trend of customer dissatisfaction continues, banks will lose valuable clients to their 'modern' competitors especially to private and foreign banks. As an antidote, Domeher *et al*., (2014) suggested the need for adoption

of modern banking technologies which saves time as a means to improve customer services. According to Ndlovu and Siyavora (2014), financial innovation has reduced customer turnaround in banking hall, reduced operational costs through reduced stationery expenses (bank slips, deposit slips). This same view was shared and expressed by Nasri (2011) as convenience in Tunisia.

Auta (2010), identify time factor as one of the prime factor that features in e-banking service quality for the customers. Saving time is an important factor which influences the customers' preference to use e-banking (Beer, 2006). Real time transaction is a very crucial factor with financial innovation. According to Mohammed, Siba & Sreekumar, (2009), Banks can make the information of products and services available on their site, which is, an advantageous proposition: Real time access to information. The banks start e-banking with simple functions such as real time access to information about interest rates, checking account balances and computing loan eligibility. Then, the services are extended to online bill payment, transfer of funds between accounts and cash management services for corporate organizations.

One of the most important dimensions of e-banking service quality is queue management (Agboola, 2006). Availability of various financial innovation products has reduced the crowding in the banking halls and pressure on the front office staff. Queue management translates into time management with consequent increase in productivity and efficiency. According to Morgan and Conboy (2014) in a study on factors affecting the adoption of Cloud Computing (Technology innovation), they opined that relative advantage was seen in terms of time-savings. Faster implementationtime is viewed as another benefit of cloud computing, something that was also evident in their study is that the participants that adopted the new innovation system explained that the turnaround time in terms of implementing the system was viewed as extremely effective. Their companies were up and running on the system in 24-hours, which is beneficial when one considers that traditional IT systems implementation can take up to six-months. Additionally, the organization was able to cut down on their administrative time by 65%.

In a Bank customers survey carried out on financial innovation adoption in Nigeria by KPMG (2014), more customers reported higher satisfaction levels with banks' turnaround time for processing transactions. In particular, speedy transactions processing was the most important service measure for SMEs and corporate clients with more than 96% of these customer segments describing it as critical to their banking relationships. Long queues at branches and ATMs continue to remain a point of hassle for customers. A majority of customers surveyed were quite dissatisfied with the almost habitual queues in bank branches, even for performing transactions considered to be routine e.g. checking account balances and making deposits etc. Banks can alleviate these concerns especially where they are unavoidable by setting minimum wait time expectations for routine transactions.

2.4.5 Transaction Costs

Credibility or risks and financial cost considerations were seen as the major setback with regards to customers' adoption of innovative banking services (Agbemabiese *et al.,* 2015). Bong-Keun and Yoon (2013), opines that transaction or financial cost have a significant impact on behavioral intention towards mobile banking usage. Transaction Cost Economics (TCE) has with no doubt had a strong impact on theories of economic exchange, with a suggestion that the boundaries of firms are consequences of transaction costs. But although such costs are evident also in contemporary post-bureaucratic contexts, in terms of collaboration costs and the risk for opportunistic behaviour, for instance firms tend to open their boundaries for knowledge exchange.

Consumers will seek out those financial products and suppliers which offer the best value for money. The benefits from financial innovation adoption mainly come from the reduced transaction cost of withdrawing cash, more interest earned (as one can afford to make less withdrawals and put or retain more savings in an interest-bearing bank account on average) and increased convenience. There are two types of costs involved with adopting an ATM card: (i) the monetary costs including ongoing annual fee and transaction fee, and (ii) non-monetary costs including learning cost, hassle cost,

psychological cost, etc. It should be noted that bank customers can use their ATM cards at their own banks for free. Therefore, it seems that to a large extent consumers can minimise transaction fees.

Customers would like the benefits from the adoption of a new innovation to be commensurate with the costs associated with the adoption of the innovation. The cost of an innovation has many components, namely, initial investment cost, operational costs and the cost of training the users to use the innovation (Premkumar *et al.,* 1994). However, technologies that are perceived to be low in cost are likely to be adopted (Tornatzky & Klein 1982, Rogers, 1983). Premkumar *et al.,* (1994) found that the cost is an important variable in the context of innovation. On the contrary, Palvia, *et al.,* (1994) found that the cost is not a significant deterrent in the adoption of IT for SMEs due to the commoditization of hardware and availability of cheap, user-friendly software packages. The switching costs related to the financial commitment required to purchase the CRM (Customer Relationship Management) and complementary products, the amount of learning or training needed to effectively use the innovation, and other time commitments may arise that lessen the desire and/or the ability to adopt the technology (Peltier *et al.,* 2002). Switching costs thus add to the total costs associated with the adoption decision.

When switching costs are high, the likelihood of adoption is reduced (Dogarawa, 2005). However, for small businesses, the costs of hardware and software are still a big deterrent to adoption, and therefore even firms evaluate the cost relative to the benefits before adopting a new technology. In a study carried out by Agbemabiese *et al.,* (2015), results from the questionnaires administered revealed that, a total numbers of one hundred and thirty (130) respondents strongly testified that, financial cost of using innovative banking service would have no impact on their decision towards the adoption and use of the service provided. On the contrary, another set of twenty (20) respondents were discouraged by the cost of using innovative banking services and to them it was too high, even if it is useful they will still not adopt the innovation. This means that, some customers were willing and would not mind the stress of going for branch-base

transaction if the cost of innovative banking is high. Where the costs are low, this will encourage greater usage of the innovative banking services. Basically, this research finding shows that high financial cost has a negative effect on consumers' adoption and use of innovative banking services. If an individual thinks that a choice of innovative banking is more costly and less beneficial, he/she might not adopt it even though he/she has a positive attitude toward financial innovation (Sierzchular, Bakker, Maat,Van-wee, 2014).

2.5 Critique of Existing Literature

World over, there has been a very modest move away from cash based transaction system. Agboola (2006) investigated electronic payment systems and tele-banking services in Nigeria. The findings revealed that payments are now being automated and absolute volumes of cash transactions have declined. But there are attendant problems such as, high cost, fear of fraudulent practices and lack of facilities necessary for innovative banking operations. These were from direct specific study rather than wholistic and general appreciation of banking technological innovation that this work is considering.

In Olatokun and Bankole (2011), using descriptive survey research design and multiple regression analysis to identify challenges faced by users with regards to e-business technologies usage among SMEsin Nigeria, the respondents were smaller organizations who concluded that benefitssuch as savings in time and cost should be the major consideration for adoption. Size is a major constraint in this work as it only considered sixty (60) SMEs, all of them put together may not be as big as a single bank like First Bank Plc, Nigeria.

In the work of Poon (2007) in Malaysia, of greater interest was security, but speed, product features and availability are very germane, because of the high level of computer literacy in the environment, unlike the situation in Nigeria, where there is generally low level of computer literacy. Apart from that, Convenient Sampling Method was used for the work, which may not display the total normal situation on ground as the

work may be biased. In Taiwan, factors affecting individual to adopt financial technology innovation according to Yu (2012) were social influence, financial cost, performance expectancy, and perceived credibility; in that order. This was from empirical evidence using Unified Theory of Acceptance and Use of Technology (UTAUT) model. Age and gender also played prominent moderating role. These are not to be considered significant in the current work because all these would have been considered before entry into Bank-Customers Relationship and provision of facilities with banks in Nigeria. Moreso, the model is about customers' perceptions, not the realities of what is happening asper this study.

The work of Nasri, (2011) in Tunisia was considered. He used 253 respondents (95 Users and 158 non Users). This work is already biased from the foundation as He has peached a higher proportion of non- user against users. May be he could have concentrated on bank customers generally and let the result tell us what he found on the field. However, the work showed that convenience, risk, security and awareness are the main factors affecting adoption principles. In Nigeria, this may be controversial as people associate appreciation only to value derived and not whom or what you are. Domeher, Frimpong and Appiah (2014), using Logistic regression, confirmed that lack of complexity and perceived usefulness assist the adoption of financial innovation. On the contrary in the same country – Ghana, Agbemabiese, Patrick and Joseph.,(2015), found that credibility and financial cost implication were the major setback for adoption. But these were case studies based on a particular bank, emphasising the peculiarity of a specific bank. Current work covers all banks in Nigeria, and wanted to see whether the result will differ.The work of Bultum (2014) in Ethiopia using TOE model (Technology Organization Environment) showed that security risk, lack of legal and regulatory frame work were the main barriers to adoption. However, only four banks were used, three private banks and one government bank. In Nigeria all banks were publicly quoted, no government bank, and all of them participated in this study.

Finally most works on adoption of financial innovation concentrate on perception theories and empirical reviews (Khalfan , Alrefai, Al-Hajery, 2006; Poon, 2007; Bultum,

2014; Oluoch , Abaja, Mwangi & Githetho, 2014 and Auta, 2010) subjective qualitative factors – though aspect of behavioral finance, but when we realize that the primary motives of innovative banking is to secure fund movement, save time and cost; investigating adoption of financial innovation based on competition, time and cost implications become more important. These factors might be more directly related to adoption of financial innovation than attitude or perception factors.

2.6 Summary

The above chapter reviews the various theories that explain the independent and dependent variables of the study. The reviewed theories are then critiqued for relevance to specific variables. The chapter also explored the conceptualization of the independent and the dependent variables by analyzing the relationships between the two set of variables. In addition, an empirical review was conducted where past studies both local and global were reviewed in line with the following criteria, title, scope, methodology resulting into a critique. Therefore, from these critiques the research gap is identified.

2.7 Research Gap

This study took a departure from past studies and incorporated several innovations, their acceptability and adoption by customers. There is a concentration of generalized innovation-adoption-performance studies mostly in developed economies leaving a paucity of innovation adoption literature for Africa emerging economies and Nigeria specifically. More so, previous works were mostly carried out in egalitarian societies not minding the peculiarities of Nigerian society.

From the reviewed relevant literature, it was evident that research in the area of financial innovations has been done but not in a comprehensive approach on Africa or Nigeria. It came out strongly that there was of lack of comprehensive analysis of multiple innovations and it also revealed concentration on output end rather than acceptance and adoption by customers which is the input end. This work considered all these and the implication of the mostly neglected quantitative factors- fraud and forgery, transaction

cost, turnaround time and financial incentives on financial innovation adoption. All the literature reviewed indicated that previous researchers only concentrated on a few or specific dependent variables of financial innovation, while this study attempted a comprehensive investigation of all financial innovation. This is because in banking operation, separate accounting records or books are not kept for each innovation product.

It is amazing to discover that no study has focus on time element in innovation adoption. No direct literature or empirical study document is found on time management, value of money and relevance of turnaround time to the adoption of financial innovation. This study explored these issues. More importantly, the analytical tools used in most previous studies looked at each variable individually. That is why this study used multinomial logistic and multivariate regression because of their ability to combine and test multiple independent and multiple dependent variables simultaneously. This study therefore intends to fill all these pertinent gaps in literature while examining what informed customers'financial innovation adoption in Nigeria deposit money banks.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

In this section the researcher discussed measures to ensure a thorough and well reported investigation, focusing on data collection and analysis methods. Data collection instruments and procedures were discussed as well as the target population and sampling procedures. Research methodology is described as way of explaining technical procedures in a manner appropriate for the purpose and the audience. It is the philosophy and general principle which guides and the description of the methods applied in carrying out the research study, how to and what analysis to be done to the data so collected. These were achieved in addressing research methods used for the study, the data collection and how the field work for the study was conducted.

3.2 Research Design

Research design was described Newing (2011) as the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. Kothari (2004) further emphasizes that research design facilitate the smooth performance i.e. carrying out the various research operations, thereby making the exercise as efficient as possible, realizing maximum result with minimal resources. Thus a research design is the structure or the blue-print of research that guides the process of research from the formulation of the research questions and hypothesis to reporting the findings.

This study used mixed method design, combining qualitative and quantitative analysis, in ways that reflect complementary strengths and non-overlapping weaknesses, this allows a mixed methods study to provide insights not possible when only qualitative or quantitative data are collected (Johnson and Turner, 2003). Put another way, mixed methods research allows for triangulation and the “opportunity to compensate for

inherent method weaknesses, capitalize on inherent method strengths, and offset inevitable method biases" (Greene, 2007). This becomes necessary in view of the quantitative and qualitative factors embedded in the study. The method was used by Huong and James (2016), in their paper on the impact of communication channels on mobile banking adoption in New Zealand. Also Martovoy and Mention (2016) in their work on Patterns of new service development processes in banking in Luxemburg used mixed design method.

Correlation research design identifies the association between two or more variables. It has been successfully used for social economic survey by other researchers e.g. Abdul-Kabeer, Mohammad & Khadim-Ali (2013) on their study on factors affecting adoption of mobile banking in Pakistan. Also Auta (2010), on Nigeria, used exploratory design to investigate the adoption of e-Banking in developing economy. Exploratory studies look for explanations of the nature of certain relationships. Hypothesis testing provides an understanding of the relationships that exist between variables. Zikmund *et al.,* (2010) suggests that the degree of uncertainty about the research problem determines the research methodology, i.e. which of the variables or factors plays major influence in the relationship. Going by the above samples and explanation, mixed method design was the most appropriate design for this study.

3.3 Target Population.

All customers and stakeholders in the recapitalized 21 banks in Nigeria were the target population of this study. There are about 35million customers and 285 Senior Management staff in Nigeria Banks (Odumeru, 2013). For the purpose of this study, the head office staff and branches of these banks were used because this is where the bulk of transactions and decisions on financial innovation process are normally concluded or performed. Issues relating to innovation products and services are normally directed from the head office of all the banks. This was why the 21 recapitalized banks head office relevant departments' management staff and the head office branch bank constituted the target population.

Table 3.1 Target Population

POPULATION TARGET	TOTAL POPULATION
Corporate Customers	**1,600,000**
Personal Customers	**35,000,000**
Operations Department	**175**
Research, Tech/ ICT Departments	**110**
Total	**36,600,275**

Source: CBN Banking Bulletin, (2012).

3.4 Sampling Frame

All registered and licensed banks in Nigeria are just 21 and all of them and their customers constituted the sample frame. It is from this sample frame that the respondents were drawn. The sampling frame for this study is as shown in appendix IV. Relevant head office departments and their senior managers who were responsible for policies on their respective banks financial innovation products and services were captured in the sampling frame. Also the corporate and individual customers of the banks who are potential targets for the utilization and adoption of the financial innovation products of the banks were captured. See appendix V.

3.5 Sample Size and Sampling Procedure

Lavrakas (2008) describes a sample in a survey research as a subset of elements drawn from a larger population. Obviously such a sample must be characteristically homogeneous with the population hence provide adequate representation. Except a

sample is full, precise and adequate both in characteristic and size, it may lead to rejection of false null hypothesis, bad decision and therefore a waste of resources (Gerstman, 2003). Equally a study that collects too much data is wasteful. Therefore it is necessary to determine adequate sample size before embarking on data collection for a study.

Since all operating banks (21) were captured, purposive, systemic sampling methods was used to distribute the questionnaires, as the study was only carried out in the head offices and head office branches of the banks. The respondents were grouped into four strata: operations department, technology and ICT department, Corporate and individual bank customers. Within each of the stratum, simple random sampling was used to select the respondents who were given a questionnaire each to complete. See appendix V. A model to determine sample size as developed by Cochran (1977) was used for this purpose.

$$n=Z2*p*(1-p)/d2$$

Where:

n = sample size large population

Z = Normal distribution Z value score, (1.96)

P = Proportion of units in the sample size possessing the variables under study.

For this study it is set at 50% (0.5)

d = Precision level desire or the signifficance of study which is expressed as decimal (e.g., 0.05 = +/- 0.05 percentage points).

The substituted values in determining the sample size for the large population are as follows

$$n = \frac{(1.96)2*(0.5)(0.5)}{(0.05)2} = 384 \text{ respondents}$$

Meaning the sample should not be less than 384 respondents.

This is made of:

i) Bank Officials -Senior managements– (Operation and Technology/ICT departments)
ii) Bank customers - Corporate and Individuals customers

In order to ensure that all necessary banks' departments and staffs were included, as well as important adjustments for local peculiarities to make the finding all embracing and robust, the respondents were enlarged to 536. All respondents and banks involved in this exercise must have been existing and in relationship for upward of 10 years (2005-2014) so as to be able to provide useful and valid information concerning the financial innovation process and adoption among the customers. Where there was a merger, acquisition, change of name or nomenclature, the surviving entity was used. The sample size and strata is as displayed in appendix V. It was made up of 536 respondents, chosen from among the Banks senior managers, major corporate and individual customers. Also information and secondary data was collected from CBN bulletin, Nigeria Interbank Settlement System and National Bureau of Statistics.

Table 3.2 Estimated Sample Size

POPULATION	ESTIMATED SAMPLE SIZE
Corporate Customers	110
Personal Customers	245
Operations Department	97
Research and ICT Departments	84
TOTA L	**536**

The selection and distribution of samples among various strata was based on asset and deposit base of each bank which is also used to determine their market share percentage according to CBN report (CBN, 2011). In essence market share percentage was used to distribute sample selection and questionnaire distribution within the target stratum of each bank. The market share of customers amongst the banks in Nigeria is fairly distributed into four groups: A=7%, B=5%, C=4% and D=3% (CBN, 2011). This with little adjustments for location and personal experience of the market was used to compute Sample size (Appendix V).

3.6 Data Collection Instrument

For this study both primary and secondary sources of data were used. Structured close and open ended questionnaire was administered for primary data collection, supported by visit and observation of the activities and operation of the banks. This was further validated by results on analysis from secondary data sourced from the Banks, CBN and NIBSS reports. Schwab (2005) defines questionnaire as measuring instruments that ask individuals to answer a set of questions or respond to a set of statement. In this study many questions begin with a series of closed questions, with boxes to tick or scales to rank the chosenoption, these were at times mingled with a section of open ended questions for more detailed response.

Mugenda and Mugenda (2003) and Kothari (2004) agree that questionnaires have various merits, like; there is low cost even when the universe is large and is widely

spread geographically; it is free from the bias of the interviewer; some answers are in respondents' own words; respondents have adequate time to give well thought out answers; respondents who are not easily approachable can also be reached conveniently; large samples can be made use of and thus the results can be made more dependable and reliable. They also concur that the main demerits of questionnaires are; low rate of return of the duly filled in questionnaires; bias due to no-response is often indeterminate; it can be used only when respondents are educated and cooperating; the control over questionnaire may be lost once it is sent. Mixed questionnaire was used in this study to obtain qualitative data from specified respondents soliciting their views concerning the patronage and the adoption of financial innovations in Nigeria deposit money banks for analysis. Sample copy of questionnaire is provided in appendix III.

Polit and Beck (2003) explain that secondary data involves the use of data gathered in a previous study to test new hypotheses or explore new relationships. Secondary data on banks were collected on; value of total deposits; volume and value of transaction on ATMs, POS terminals, Mobile banking, Internet banking and EFT; financial innovation fraud, forgery and robbery statistics; Interest rate, Promotion and advertisement costs, Average number of customers served per day, Service down time days per annum, Charges and Average time spent on queue to be served. These secondary data were collected from the Central Bank of Nigeria, National Bureau of Statistics and Nigeria Interbank Settlement System over a period of ten years, 2005-2014. (Appendix VI)

3.7 Data Collection Procedure

Twelve (12) trained field officers were engaged; an average of one for two banks to assist in the administration and collection of the questionnaires. They equally served as liaison and collation officers in case of any problem for the period of two weeks while the exercise last. Preliminary investigation and experience have shown that field officers would be given better attention usually between 12:30 pm and 2:30 pm when, staffs were on break and activities in banks are a bit relaxed. This was maximally explored and

utilized. The entry point to the banks was through the human resource and ICT departments. The researcher worked in collaboration with trusted internal informants in each of the banks, supported with letter of introduction from the University.

Kothari (2004) describes primary data as those which are collected afresh and for the first time, and thus happen to be original in character. Lucas (2005) describes primary data as those items that are original to the problem under study while Ember and Ember (2009) describe primary data as data collected by the investigator in various field sites explicitly for a comparative study. Dawson (2009) states that secondary research data involves the data collected using information from studies that other researchers have made of a subject. Ember and Ember (2009) describe secondary data as data collected by others and found by the comparative researcher in ethnographies, censuses and histories. Both sets of data were used in this study.

The questionnaire were structured into three main sections; Bio data of respondent- Here, a brief personal detail on the respondent and the use of financial innovation were obtained; Drivers and barrier of financial innovation products, these are the various variables, factors and content reviewed in this study; and finally familiarity with and patronage of financial innovation products by customers and staff of the banks. Overall there were sixty six (66) questions (majorly in Likert scale format), in each set of questionnaire which were concisely designed in such a way that they would be easily comprehended and responded to. Organization's and staffs' permissions to do this were sought and approval received. Two week notice was given before administration of questionnaire.

3.8 Pilot Test

For primary data, a pilot test was carried out before the main data collection, todetermine the reliability of the survey instruments, vagueness and clarity of items. Babble (2002), stated that pilot testing is a trial run of procedure and instruments that someone plans to use in carrying out a research and also conducted to check the reliability and validity of the questionnaire. The rule of the thumb is that 1% of the

sample should constitute the pilot test. Pilot test was therefore carried out by using five (5) management staff and eight (8) major customers of FCMB Bank Plc, Osogbo branch within a period of two-week period. The response of the pilot administration of the instruments was used to correct the construct and content values of questions used in the main administration, most open ended questions were not adequately answered and the researcher dropped some of them from the instrument during the main data collection. There was also low initial Cronbach's alpha coefficient and this was overcome through improvement of the instrument.For all statistical analyses, a probability level of 0.05 was regardedstatistically significant, using SPSS package.

3.8.2 Instrument Validity

Content validity which is concerned with the extent to which the scale measured what it was supposed to measure was carried out. Weber (1990), states that to make valid inference from a test, it is important that the classification procedure be reliable, in the series of being consistent. Though there is likely to be some errors whether intentionally or unintentionally, therefore every measurement result included measurement error to ensure the validity of such measurement. Validity refers to the accuracy of the measurement process while the reliability of measurement refers to its consistency; that is, the extent to which a measuring device will produce the same results when applied more than once to the same person under similar conditions (Gakure, 2010).Validity test of the questionnaires in recognition of the above was done on its content, face and construct. Content validity evaluates the degree to which a test appears to measure a concept analysis of the items in order to ensure an adequate coverage of the scope of the study by the measuring instrument (Oyerinde, 2011).

Factor analysis was used to assess the validity and Cronbach's alpha to assess reliability of the questionnaire. Necessary corrections were made on the inadequacies of the instrument. This was done to determine and ascertain content validity i.e. to ascertain the relevance of each question to factors being measured and ensured that the content of

the instrument provide answers to the objectives of the study and the formulated hypotheses.The outcomes were used to amend face validity and ensure contentvalidity.

3.8.3 Instrument Reliability

Reliability refers to the appropriateness and consistency of a method of measurement to produce the same result under the same condition if a test or measurement is repeated and carried out on the questionnaire. Reliability may be internal or external reliability. Internal reliability refers to the consistency of the result within a particular site and plausibility of the data within that site. External reliability refers to the consistency and duplicative attribute of data within and across the site (Castilo, 2009). The most straightforward way of testing reliability is to replicate; either by administering the same questions to the same respondents at different times and assessing the degree of correlation, or by asking the same question in different ways at different points in the questionnaire (Johnson & John, 2002). Reliability was tested in this study using questionnaire duly completed by thirteen (13) randomly selected respondents in the pilot study. These respondents were not included in the final main study sample in order to control for response biase.

The logic and sequence of the research instruments was confirmed by Cronbachs' co-efficient alpha, which measures internal consistency i.e. constructs validity, using statistical package for social sciences (SPSS). Cronbachs' coefficient (alpha) can range between 0 to 1, with 0 representing an instrument full of errors and 1 representing total absence of error. The closer Cronbach's alpha coefficient is to 1, the higher the internal consistency reliability (Oyerinde, 2011). A reliability coefficient (alpha) of 0.70 is considered acceptable, reliable and recommended for new questionnaire. Questions that appeared vague, incomprehensible, or do not induce meaningful response were either changed or reworded or dropped.

Reliability test was carried out on the tool to test the goodness of data. After applying the Cronbach's coefficient alpha test, an overall alpha coefficient of 0.56 was reached.

After improving the tool, a reliability test was redone achieving Alpha coefficient of 0.7 with each variable's reliability coefficient indicated in the respective tables. Scales in the questionnaire of 0.7 and above indicate satisfactory reliability (Saunders, Lewis & Thornhill, 2009; Newing, 2011). Based on these recommendations, financial incentives, transaction cost, turnaround time and fraud risks variables in the study questionnaire were concluded to have adequate internal consistency and were reliable for the study and their results could be used to generalize on population characteristics. From Pilot test to collation of final questionnaire, took approximately eight weeks.

3.9 Data Processing and Analysis

Each factor/ variable and its component elements based on specific objectives, were cleaned and purified to avoid a spurious finding and decision when testing the following hypotheses

Ho: Financial incentives have no significant effect on financial innovation adoption.

Ho: Fraud risk has no significant effect on financial innovation adoption.

Ho: Turnaround time has no significant influence financial innovation adoption.

Ho: Transaction cost has no significant effect on financial innovation adoption.

The study's construct measures were initially purified using exploratory factor analysis (EFA) and tested for reliability analysis using SPSS 21. The raw measures were purified and tested for validity and reliability by running a series of tests. The initial assessment was the unidimensionality of measures. Exploratory factor analysis was performed to assess construct unidimensional scales and identify the structure of the measurement or outer model for the items in the study. Exploratory factor analysis was performed to achieve measure purification and refine the variables into the most effective number of factors. Reliability analysis was then conducted.

Each of the constructs was refined by using principal component analysis on the initial items comprising each construct. Each principal component analysis extracted factors, and factor loadings greater than 0.5 were retained for each principal component extracted (Hair, Black, Babib, Anderson & Tatham, 2010). To assess the factorability of items, the researcher examined this indicator (i.e. Kaiser Meyer-Olin Measure of Sampling Adequacy and communalities). For every EFA, it was found that the variables have a KMO Measures of sampling adequacy above the threshold of 0.6 (Kaiser, 1974). Communalities were also found well above 0.5 suggesting satisfactory factorability for all items. When applying EFA, the results showed a clear factor structure with an acceptable level of cross loadings. Additionally, the reliability and internal consistency of the items constituting each construct was estimated. Scale refinement was assessed using item to total correlations analysis, with indicators with an item to total correlation threshold of 0.3 and higher being maintained for further analysis (Hair *et al.*, 2006).

Descriptive statistics such as mean scores, standard deviations, percentages, and frequency distribution was computed to describe the characteristics of the variables of interest in the study. Inferential statistics such as correlation, multivariate and multinomial logit regression analysis as suggested by Muthen and Muthen (2007) was used to establish the nature and magnitude of the relationships between the variables and to test the hypothesized relationships. Once the strength of the predictors was determined, the variables that best determine the model was used in a step by step method to run the multinomial logitregression to determine the predictors that best predict the dependent variable for primarydata and multivariate regression for secondary data.

The probability of a consumer's financial innovation adoption is employed as a set of separate dependent variables of this study. Specifically, each factor affecting consumers' adoption of the five specific innovative banking products was investigated separately using multinomial logitregressions, because of the possibility that the effects of explanatory variables could vary across the type of innovative product. In situations where customer has a large number of innovations at his/her disposal, innovation

adoption is more appropriately modeled as a multiple process since (i) adoption of any one innovation does not preclude the adoption of any other and thus, reduce the importance of the path dependence argument by Cowen and Gunby (1996), (ii) there is no limit to the number of innovations adopted, as long as the last adopted is profitable (Lohr & Park, 2002; Isgin, Bilgic, Foster & batte, 2008).

3.9.1 Serial correlation

Autocorrelation, also known as serial correlation or cross-autocorrelation, is the cross-correlation of a signal with itself at different points in time. Informally, it determines the similarity between observations as a function of the time lag between them. The Durbin-Watson test was used to determine this.

The Durbin-Watson test uses the following statistic:

$$d = \frac{\sum_{i=2}^{n}(e_i - e_{i-1})^2}{\sum_{i=1}^{n} e_i^2} \quad \text{.....[1]}$$

Where

the $e_i = y_i - \hat{y}_i$ are the residuals,

n = the number elements in the sample

k = the number of independent variables.

d takes on values between 0 and 4.

A value of $d = 2$ means there is no autocorrelation. A value substantially below 2 (and especially a value less than 1) means that the data is positively autocorrelated, i.e. on average a data element is close to the subsequent data element. A value of d substantially above 2 means that the data is negatively autocorrelated, i.e. on average the data element is far from the subsequent data element.

3.9.2 Normality test

Normality of data was tested by use of Shapiro-Wilk test, According to Sharpiro and Wilk (1965), this was necessary to illustrate that the standardized residuals was significantly normally distributed. Thus if the *p*-value is less than the chosen alpha level, then the null hypothesis is rejected On the contrary, if the *p*-value is greater than the chosen alpha level, then the null hypothesis that the data came from a normally distributed population cannot be rejected. For example at an alpha level of 0.05, a data set with a *p*-value of 0.02 rejects the null hypothesis that the data are from a normally distributed population. However, since the test may be biased by sample size, as the test may be statistically significant from a normal distribution in any large samples. Thus a Q–Q plot or P-P Plot was required for verification in addition to the test.

Normal Q-Q Plots: This is a graphical procedure that plots the observed values on the X-axis and the expected values (assuming a normal distribution) on the Y-axis. Where the sample distribution is distributed exactly like a normal distribution, the points should fall on a straight line. P-P Plot may be used in place of Q-Q Plot if cumulative data – Probabilities were used as against direct observed data- Quantiles in Q-Q Plot.

3.9.3 Model Specification

The econometric model adopted for the study was Multinomial logit model. The multinomial logit model could be general or conditional. Both the generalized logit and conditional logit models are used in the analysis of discrete choice data. However the term multinomial logit model is often used to describe the generalized logit model. The multinomial logit regression was used because there are many independent and dependent variables. In many situations, a mixed model (combined generalized and conditional multinomial logit models) that includes both the characteristics of the alternatives and the individual is needed for investigating consumer choice.

Multinomial logistic model has been successfully used by other researchers and logistic regression for multinomial outcomes has been extensively used in the social sciences including economics, banking and finance, (Filmer & Pritchett 2001; Manski & McFadden, 1981 and Maddala, 1988); Domeher, Frimpong and Appiah(2014) in Ghana

on similar studies. Ndilov and Siyavora (2014) also used it on Impact of internet banking on the Zimbabwean banking sector and Muturi (2012), who studied participation in roscas in Nairobi slum Kenya.

Multinomial logit modelswere estimated to determine the study objectives (i) to (iv). According to Muturi (2012), in a multinomial logit model, the individual is assumed to know all the mode specific attributes and to choose the alternative that maximizes his utility. The difference between the conditional logit and the general multinomial logit is that in the conditional logit, the estimated regressors do not vary across alternatives while the general multinomial logit allows for regressors to vary across alternatives and the observed choice is determined by the differences in utilities across alternatives. The observed choice is determined by the differences in utility across alternatives, rather than in levels of utility. This implies that the modes involve a comparison of the utility obtained from each option. A MNL model is specified as

$$(y_i = j) = e\ \beta_{jvi} / \Sigma^{j}_{j=1} (e\ \beta_{jvi})\ j = 1 \ldots j \qquad \ldots\ldots\ldots\ldots\ldots\ldots\ldots [2]$$

Because $\Sigma^{j}_{j=1} y_i = 1$, a restriction is needed to ensure model identification and the usual restriction is that $\beta_i = 0$. While in a conditional logit values of Xs are used as derivatives from the means, in multinomial logit derivations coefficients are used to compute marginal benefits/utility expected at alternative modes/channel. The mode with the highest benefit will lead to participation for that mode. The utility comparison is expressed as:

$$V_{ij = pr} (V_{ij >} V_{ik}) \text{ for all } j \neq k \qquad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots [3]$$

Where Vij is the benefit or utility of participating in or using a particular mode or channel while V_{ik} is the benefit of a particular mode or channel k by the same individual i. Vij are the benefits of participating or using that individual j expects from participating or using a particular mode or channel j (j=1….j).

The multinomial logit model assumes that the disturbance terms are distributed as Weibull (Muriithi, 2009). This model imposes the property of independence of irrelevant alternatives (IIA).This means that the introduction of an additional choice decreases the predicted fraction of the sample that chooses each of the original alternatives in proportion to their size before the introduction. This assumption states that there are no sub-groups within the alternatives that are closely related. Rather, all modes are independent in such a way that any introduction of an extra mode will reduce participation probabilities across all modes. The attractiveness of MNL is that it is simple to estimate, and interpret the estimated parameters

3.9.4 Multivariate Regression analysis for Secondary data

In this work there were multiple dependent variables (ATM, POS, EFT, MB and IB) and multiple independent variables (Financial Incentives, Fraud Risks, Transaction Costs and Turnaround Time). In such a situation, multivariate regression is used to predict the value of one or more responses from a set of predictors. It can also be used to estimate the linear association between the predictors and reponses. Predictors can be continuous or categorical or a mixture of both. Multivariate statistical analysis refers to multiple advanced techniques for examining relationships among multiple variables at the same time. Researchers use multivariate procedures in studies that involve more than one dependent variable (also known as the outcome or phenomenon of interest), more than one independent variable (also known as a predictor) or both. This type of analysis is desirable because researchers often hypothesize that a given outcome of interest is affected or influenced by more than one thing (Hall & Media, 2016).

There are many statistical techniques for conducting multivariate analysis, and the most appropriate technique for a given study varies with the type of study and the key research issues. One of the most common multivariate techniques is multiple regression analysis, others are factor analysis, path analysis andmultiple analysis of variance.Multiple regression analysis, often referred to simply as regression analysis, examines the effects of multiple independent variables (predictors) on the value of a

dependent variable, or outcome. Regression calculates a coefficient for each independent variable, as well as its statistical significance, to estimate the effect of each predictor on the dependent variable, with other predictors held constant. Researchers in economics and other social sciences often use regression analysis to study social and economic phenomena, a statistical tool that allows one to examinehow multiple independent variables are related to multiple dependent variables.

Once it is identified how these multiple variables relate to the dependent variables, one can take information about all of the independent variables and use it to make much more powerful and accurate predictions about why things are the way they are. This latter process is called "Multiple Regression'' Users of Multivarate regression on financial investigation includes Tsay, (2005); Majekodunmi and Harris (2016). Often, multivariate tests are more powerful, when the responses are correlated. Small, positively correlated effects can pool power. If responses are uncorrelated, no need for multivariate tests, but this is rarely so. Multivariate tests provide a way to understand the structure of relations across separate response measures. In particular: How many "dimensions" of responses are important and how do the predictors contribute to these? Therefore for secondary data analysis multivariate regression was used. This also afforded communicative validity or otherwise of the Primary data analysis result.

3.9.5 Model Specification Test

Before regression, diagnostic tests as recommended by Malhotra and Dash (2011) were conducted to assess for the model's underlying statistical assumptions. To check for normality, the study used skewness and kurtosis statistic to check the distribution of the variables and as recommended by Myoung (2008), the rule of thumb that a variable is reasonably close to normal if its skewness and kurtosis have values between -1.0 and + 1.0. Linearity of variables was tested using correlation coefficients as suggested by Cohen, West and Aiken, (2003). To test for heteroscedasticity, Levene test (1960) for equality of variance was computed using one way Anova procedure. Multicollinearity in the study was tested using Variance Inflation Factor (VIF) calculated using SPSS regression procedure as well as examination of correlation coefficient among variables.

A VIF of more than 10 (VIF ≥ 10) indicated a problem of multicollinearity. The variance inflation (VIF) and the tolerance statistics were computed to check whether a predictor has a strong linear relationship with the other predictor (s).

The cutoff threshold for this study was a VIF value of 10 and above to indicate multicollinearity while tolerance statistic values below 0.1 indicate a serious problem while those below 0.2 indicate a potential problem. The adjusted coefficient of determination (R-squared) was used to indicate the percentage of variability of the variables that was accounted for by the factors under analysis. R-squaredmade it possible to examine the influence of all the independent variables combined. This was followed by determination of standardization beta (β) coefficient which indicated the direction (+ or -) and the magnitude of the influence as well as compare the relative contribution of each independent variable contribution to financial innovation adoption. Hypotheses were tested based on the probability (p-value) value. It was used to determine whether influence by independent variable was significant or not. When $P \leq 0.05$ the null hypothesis was rejected and vice-versa. Statistical analysis was conducted using Statistical package for social science (SPSS) and Stata. – For primary data.

3.10 Measurement of the Variables

For the purpose of this study, two set of variables were considered namely; the independent and the dependent variables. The independent variables which are the factors determining financial innovation adoption are; Transaction cost, Financial incentive, Turnaround time and Fraud risk. The dependent variable is Financial innovation (instruments and channels): which is made up of ATM, EFT, POS, Mobile and Internet Banking are the various technological products whose patronageand usage by the customers (adoption), is to be determined. The primary and secondary data gathered were presented in a tabular format for meaningful analysis and interpretation. Because more than two sets of variables were involved, the study used multivariate tabulation. Table 3.3 demonstrates; types and nature of variables, indicators and measurement, collection methods, type and level of analysis. Also correlation,

multivariate and multinomial logit regression analysis were used to analyse the data obtained. The degree of relationship and influence within these variables, their pattern of behaviour and performance were examined at 0.05, level of significance (5%). Finally, Analysis of variables and test of hypotheses were carried out using the following models:-

Multinomial Logit - $$(y_i = j) = e\ \beta_{jvi} / \Sigma^{j}_{j=1} (e\ \beta_{jvi})\ j = 1 \ldots j \quad \ldots\ldots\ldots [4]$$

Multivariate Regression- $$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon \quad \ldots..[5]$$

Table 3.3 Measurements of Variables and Analysis of Objectives.

S/N	Variable name	Objectives	Data Requirements and Operational measures	Level of Analysis and Source of Data	Analytical tools to be used
1	Dependent - Financial Innovation Financial Instrument	To establish the determinants of Financial innovation adoption in Deposit Money Banks in Nigeria.	Volume and Value of transactions on each facility per annum (ATMs, EFT, POS, IM and MB)	Quantitative-Collection sheet for secondary data and Administration of questionnaire for primary data.	Descriptive statistics, multivariate and multinomial logistic regression, correlation ,Z test.
2 A	Independent-Financial Incentives(FI)	To determine how Financial incentives affect the adoption of Financial innovation products and services in Deposit Money Banks in Nigeria.	Amount spent by banks on Cash bonuses, souvenirs, top ups, promotion and advertisement as incentives for innovation patronage	Descriptive and Quantitative-Collection sheet for secondary data and Administration of questionnaire for primary data.	Descriptive statistics, multivariate and multinomial logistic regression, correlation, Z-test.
B	Fraudrisk(Fr)	To explore the extent to which fraud risk affects the adoption of Financial innovation products and services in Deposit Money Banks in Nigeria.	Number and Value of FTI frauds and forgery per annum. Claims/ losses on FTI fraud per annum.	Descriptive and Quantitative-Collection sheet for secondary data and Administration of questionnaire for primary data.	Descriptive statistics, multivariate and multinomial logistic regression, correlation, Z-test.
C	Transaction cost (Tc)	To appraise how transaction cost affect the adoption of Financial innovation products and services in Deposit Money Banks in Nigeria.	Management charges, annual subscription, service charge, other costs on innovative products by banks per annum.	Descriptive and Quantitative-Collection sheet for secondary data and Administration of questionnaire for primary data.	Descriptive statistics, multivariate and multinomial logistic regression, correlation, Z-test.
D	Turnaround time (Tt)	To determine how turnaround time affect the adoption of Financial innovation products and services in Deposit Money Banks in Nigeria.	Time taken to be served. Time taken to stay on queue. (Per transaction) and Network down times per month.	Descriptive and Quantitative-Collection sheet for secondary data and Administration of questionnaire for primary data.	Descriptive statistics, multivariate and multinomial logistic regression, correlation, Z-test.

Sources: Domeher *et al*.,(2014); Oluoch *et al.,*(2012); Olaoye and Dada (2011); Nasiri, (2011); Sierzchular*et al.,* (2014); Iddris, (2013); Rogers, (2003); Rumanyika, (2015); Iftekhar,Schmiedel and Song,. (2009); Agbemabiese *et al.,*(2015): Ndilov and Siyavora,(2015).

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

This chapter deals with organization, analysis and presentation of data collected from respondents using questionnaires and secondary data sheet which were designed to measure the hypothesis of the study. It focused on influence of fraud/security risk, transaction cost, turnaround time and financial incentives on the adoption of financial innovation products and services by customers of Deposit money banks in Nigeria. It gives the empirical findings and results following the application of these variables using the techniques indicated in the third chapter. The implications are then discussed. Most of the questions were Likert-type, scale ranging from 1 to 5 indicating the extent to which the respondents agreed or disagreed with each statement used to capture the different variables. The rate of financial innovations adoption by customers was proxied by total bank deposit and customers base as revealed by value and volume of transactions on each of thefinancial innovation products and services (instrument/channel).

4.2 Response Rate

The researcher distributed five hundred and thirty six questionnaires (536). Out of these only three hundred and ninety two questionnaires (392) were completed and returned. This represents a response rate of 73% and none response rate of 27%. According to Mugenda and Mugenda (2003), a response rate of 50% is considered good and response rate greater than 70% is considered to be verygood. Kothari (2004) indicated that for a social study response rate above 60% is adequate. Based on the assertions of Oloyo (2001), a good response rate for a study is important because it reflects the suitability of the study procedure. The 73% response rate is therefore considereda good representative of respondents to provide enough information for analysis and to derive conclusions.

Table 4.1: Response Rate

Response rate	Sample size	Percentage (%)
Returned questionnaires	392	73
Un-returned questionnaires	144	27
Total	**536**	**100**

4.3 Factor Analysis

Factor analysis looks at the internal-correlations among data to come up with internally consistent surrogates of the variable (Mugenda, 2010). These correlations helped the researcher to formulate an interpretation of the components (variables). Cooper and Schindler (2008) have indicated 0.7 to be an acceptable loading. Other researchers suggest that 0.4 is the minimum level for item loading. Costello and Osborne (2005) argues that if an item has loading of less than 0.4 it may either not be related to the other items or suggests an additional factor that should be explored. Hair *et al.,* (2010) highlighted that factor analysis was necessary in research to test for construct validity and highlight variability among observed variables and to also check for any correlated variables in order to reduce redundancy in data.

The study used factor analysis to reduce the number of indicators which do not explain the effect of financial considerations on financial innovation adoption and retain the indicators which are capable of explaining the effect. Exploratory factor analysis was performed to assess construct unidimensional scales and identify the structure of the measurement or outer model for the items in the study. This was performed to achieve measure purification and refine the variables into the most effective number of factors. Only the factors with values of above 0.4 and were used for further analysis as recommended by Hair *et al.,* (1998) and Tabachnick and Fidell (2007) who noted that factors with factor loading above 0.4 shall be retained for further study. Hair *et al*., (1998) and Tabachnick and Fidell (2007) described the factor loadings as follows: 0.32 (poor), 0.45 (fair), 0.55 (good), 0.63 (very good) or 0.71 (excellent).

The study used the Cronbach's alpha to measure the reliability of the data gathered from the field. Cronbach's alpha is a coefficient of reliability that gives an unbiased estimate of data generalizability (Zinbarg, Ravelle, Yowel & Li, 2005). According to Zinbarg *et al*., 2005), an alpha coefficient of 0.70 or higher indicated that the gathered data is reliable as it has a relatively high internal consistency and can be generalized to reflect opinions of all respondents in the target population. All constructs depicted that the value of the Cronbach's alpha are above the suggested value therefore reliable and accepted for the study. The results and interpretation of the factor analysis is presented in the summary and sub-sections that follow for each of the study indicators.

The finding in Table 4.2 show the overall summary of the factor analysis for all the variables, the four factors measuring the independent variables and two factors measuring dependent variables; Financial incentives show that all the factor loadings for the nine items were above 59.5%. All the items were accepted based on the general rule of thumb for acceptable factor loading of 40% and above. No item was removed or expunged. The results of the factor analysis for Fraud risk with eleven items divulge a factor loading of 57.19%. This implies that all items fall within the acceptable threshold based on the general rule of thumb as none of the item was dropped. The factor analysis for Transaction cost, with six items shows factor loadings above 52%. Since all the loadings were above 52%, no factor was dropped because they followed the acceptable threshold. For Turnaround time, there were seven items. Two were dropped for inconsistency or irrelevance. The factor loadings for the remaining five were above 51%.

The result of the factors measuring the dependent variable Financial Innovation Adoption (Customers' opinion (Customers and Deposit Base) and Staff opinion (Instruments)) was also subjected to factor analysis. All the factor loadings were above 41% which implies that all items fall within the acceptable threshold as no item was dropped. Table 4.2 indicates that all the factor loading of all the items were above 40% and thus all were considered for further statistical analysis. Detailed analysis of the factor analysis on the individual items of the construct can be seen below.

Table 4.2 Summary of Factor Analysis

Independent / Dependent Variables	Number of Items	Overall factor loading	Reliability Cronbach's alpha
Financial incentive			0.756
	9	Above 59%	
Fraud / security risk			0.861
	11	Above 57%	
Turnaround time			0.767
	5	Above 51%	
Transaction cost			0.817
	6	Above 52%	
Customers Opinion on FINO (Customers and Deposit Base)	5	Above 54%	0.786
Staff Opinion on FINO Instruments	6	Above 58%	0.854

4.3.1 Financial Incentive

In Table 4.3 the Cronbach‟s Alpha values for all the indicators before and after extraction with a factor loadings value of less than 0.4 is presented. Cronbach‟s Alpha results in the first column were computed using results of all the indicators and the Cronbach‟s Alpha results in the last column were computed after the reduction of indicators/factors with factor loadings of less than 0.4. The findings of the study show that there were no indicators with less that 0.4 factor loading. All the factor loadings were above the 0.65 which was described by Hair *et al.,* (1998) and Tabachnick and Fidell (2007) as excellent. The researcher therefore retained all the indicators of financial incentive as recommended by Hair *et al.,* (1998) that factors with factor loadings of above 0.4 should be retained for further data analysis.

Therefore the Cronbach's alpha result for financial incentive before and after factor loading remained the same (0.756). The value of the Cronbach's alpha which was above the 0.70 and this corroborated with Zinbarg *et al.,* (2005) that an alpha coefficient of

0.70 or higher indicates that the gathered data was reliable as it has a relatively high internal consistency and can be generalized to reflect opinions of majority of the respondents in the target population.

Table 4.3 Reliability and factor analysis (Validity) of Financial incentive

	Reliability		**PCA**				
Items	Cronbach's alpha before	item -total correlation	KMO	communalities	component loading	variance extracted	Cronbach's alpha after
FI1	0.756	.303	0.809	.699	.835	59.50%	0.756
FI2		.348		.560	.747		
FI3		.355		.589	.761		
FI4		.491		.519	.720		
FI5		.614		.666	.816		
FI6		.589		.610	.779		
FI7		.568		.619	.787		
FI8		.591		.644	.802		
FI9		.435		.549	.665		

Key

FI1	Financial innovations are economical
FI2	Financial innovation products enhance status
FI3	Interest rate is used as incentive
FI4	Gifts and special bonuses can entice customers
FI5	No incentive can induce customers but freewill
FI6	Souvenir is banks strategy for patronage
FI7	Advertisement are used to sensitize customers
FI8	Extra features are used banks as incentives
FI9	Customers are not aware of any incentive

4.3.2 Fraud Risk

The result in Table 4.4 presents Cronbach's alpha value of fraud risk factors, before and after extraction of factors with a factor loading of less than 0.4. The table shows that all the eleven factors had Cronbach's alpha value of 0.861 and factor loading between 0.826 and 0.605. This rule out elimination of any of fraud /security risk factors as none of the

factors had a loading of less than 0.4. The Cronbanch's alpha value improved slightly from 0.834 to 0.861 after a little adjustment. All the factors were retained.TheCronbach's Alpha value of more than 0.7 implied that the gathered data was reliable and therefore could be used for generalization.

Table 4.4 Reliability and factor analysis (Validity) of Fraud risk

	Reliability		**PCA**				
Items	**Cronbach's alpha before**	**item -total correlation**	**KMO**	**Communalities**	**component loading**	**variance extracted**	**Cronbach's alpha after**
FR1	0.834	.437	0.861	.655	.675	57.19%	0.861
FR2		.418		.592	.708		
FR3		.511		.671	.826		
FR4		.486		.553	.732		
FR5		.481		.576	.758		
FR6		.555		.622	.793		
FR7		.572		.641	.804		
FR8		.553		.583	.758		
FR9		.568		.652	.818		
FR10		.582		.647	.801		
FR11		.452		.588	.605		

Key
FR1 Confidential information is safe
FR2 Transparency and accuracy are guaranteed. No errors
FR3 Many robberies and faceless looters abound
FR4 Network failure gives room to fraud
FR5 Banks reputation affects Financial innovation adoption
FR6 litigations, errors and frauds cast doubt on security of FINO
FR7 Low literacy level contributes to fraud perpetration
FR8 Refund procedure on genuine error is frustrating
FR9 Financial innovation is well secured and fraud free
FR10 Bank size and distribution strategy safeguard frauds
FR11 Financial innovation products are totally fraud resistant

4.3.3 Turnaround Time

Table 4.5 below, presents the Cronbach's alpha values of turnaround time factors before and after extraction of factors with a factor loadings value of less than 0.4. The results show that the Cronbach's alpha value was 0.767. The results also show that the factor loadings ranged from 0.662 and 0.776 which is described as good by Hair *et al*. (1998)

and Tabachnick and Fidell (2007). Two factors – one on consistent queue for service because of varieties and another on timing of banking services were dropped because of lesser weight. This implies that the Cronbach's alpha value improved from 0.756 to 0.767. The fact that the value of the Cronbach's alpha was above the 0.70 indicates that the gathered data is reliable as it has a relatively high internal consistency and can be generalized to reflect opinions of majority of the respondents in the target population.

Table 4.5 Reliability and factor analysis (Validity) of Turnaround time

	Reliability		**PCA**				
Items	**Cronbach's alpha before**	**item - total correlation**	**KMO**	**Communalities**	**component loading**	**variance extracted**	**Cronbach's alpha after**
TT2	0.756	.475	0.806	.538	.662	51.87%	0.767
TT3		.572		.565	.752		
TT4		.602		.602	.776		
TT5		.509		.582	.694		
TT6		.527		.506	.711		

Key

TT1	Varieties of innovative products nullifies need to queue
TT2	Learning the use of financial innovation is easy and saves time
TT3	Operational delays and interrogations are removed
TT4	Time and space barriers removed
TT5	Yuppes and Corporate customers are main targets
TT6	Modern banking is faster than traditional banking
TT7	Timing of Banking service is a fruitless effort.

4.3.4 Transaction Cost

Table 4.6 shows that Cronbach's alpha values of Transaction cost factors before and after extraction of factors with a factor loadings value of less than 0.4. It shows that the Cronbach's alpha results of all the transaction cost factors was 0.817 and the factor

loading of between 0.928 and 0.809. This ruled out elimination of any (Transaction cost) employed commitment factors as none of the factors had a factor loading of less than 0.4 as recommended by Hair *et al.,* (1998). The Cronbach's Alpha value of more than 0.7 implied that the gathered data was reliable and therefore could be used for generalization.

Table 4.6 Reliability and factor analysis (Validity) of Transaction cost.

	Reliability		**PCA**				
Items	**Cronbach's alpha before**	**item -total correlation**	**KMO**	**communalities**	**component loading**	**variance extracted**	**Cronbach's alpha after**
TC1	0.817	.639	0.779	.672	.809	52.95%	0.817
TC2		.657		.655	.753		
TC3		.617		.651	.800		
TC4		.623		.779	.923		
TC5		.448		.836	.928		
TC6		.517		.816	.887		

Key

TC1 Charges are unnecessary burden

TC2 Asset acquisition and staff are borne by customers

TC3 Cost of making Fin- innovation acceptable reduces adoption

TC4 Infrastructure running cost is enormous

TC5 Switching costs discourage financial innovation adoption

TC6 Deliberate financial deepening policies has cost implication

4.3.5 Customer Opinion on Financial Innovation (Customes and Deposit Base)

Table 4.7 shows that Cronbach's alpha values of Customers' opinion factors before and after extraction of factors with a factor loadings value of 0.4. It shows that the Cronbach's alpha results of all customers' opinion factors before and after factor loading was 0.786 and the factor loading of between 0.697and 0.860. This ruled out elimination

of any Customer opinion factors as none of the factors had a factor loading of less than 0.4 as recommended by Hair,*et al.,* (1998). The value of the Cronbach's alpha which was above the 0.70 or higher indicates that the gathered data is reliable and reflect opinions of majority of the respondents in the target population. A view corroborated with Zinbarg*et al.,* (2005).

Table 4.7 Reliability and factor analysis (Validity) of Customer Opinion on Financial Innovation

	Reliability		**PCA**				
Items	**Cronbach's alpha before**	**item -total correlation**	**KMO**	**Communalities**	**component loading**	**variance extracted**	**Cronbach's alpha after**
COFI1	0.786	.665	0.799	.670	.825	54.20%	0.786
COFI2		.632		.630	.794		
COFI3		.702		.715	.860		
COFI4		.491		.596	.697		
COFI5		.338		.583	.785		

Key

COFI1 Social status influence decision on adoption of FINO
COFI2 Customers familiar with mortal banking than space banking
COFI3 State of infrastructure inhibit financial innovation adoption
COFI4 Innovative banking is more secured and fraud free
COFI5 Adequate information on use, benefits and availability of FINO

4.3.6 Staff Opinion on Financial Innovation (Instruments)

Components and factors on Staffs' opinion on financial innovation as found out in the study is presented in Table 4.8 below, there were no indicators with less that 0.4 factor loading. All the factor loadings were above the 0.69 which was described by Hair *et al.,* (1998) and Tabachnick and Fidell (2007) as excellent. The researcher therefore retained all the indicators of staffs' opinion as recommended by Hair, *et al*., (1998) that factors with factor loadings of above 0.4 should be retained for further data analysis. Therefore

the Cronbach's alpha result for all Staffs' opinion before and after factor loading remained the same (0.854). The value of the Cronbach's alpha which was above the 0.70 and this corroborated with Zinbarg*et al.,* (2005) that an alpha coefficient of 0.70 or higher indicates that the gathered data is reliable as it has a relatively high internal consistency and can be generalized to reflect opinions of majority of the respondents in the target population.

Table 4.8 Reliability and factor analysis (Validity) of Staff Opinion on Financial innovation

	Reliability		**PCA**				
Items	**Cronbach's alpha before**	**item - total correlation**	**KMO**	**communalities**	**component loading**	**variance extracted**	**Cronbach's alpha after**
SOFI 1	0.854	.627	0.87	.560	.748	58.14%	0.854
SOFI 2		.684		.628	.792		
SOFI 3		.561		.578	.691		
SOFI 4		.689		.640	.800		
SOFI 5		.596		.523	.723		
SOFI 6		.703		.658	.811		

Key

SOFI1 Income level relevant in financial innovation adoption

SOFI2 Financial innovation flawless, no security compromise

SOFI3 Incentives like interest rate can improve adoption of FINO

SOFI4 With FINO penetration strategy, no cause for alarm

SOFI5 Financial deepening and inclusion comes with costs

SOFI6 FINO products are totally fraud resistant

4.4 Descriptive Statistics

Descriptive statistics in this study were used to describe the basic features of the data that was gathered. They provide simple summaries about the sample and the measures together with simple graphic illustrations. They form the basis of quantitative analysis of data.

4.4.1 Background Information

This section reviews the personal characteristics of the study respondents. Respondents were asked about their gender, age, marital status, level of college education attained and computer literacy, income, occupational spread, work experience, whether a user or none user of financial innovation among many other personal information. This information becomes necessary in order to help the researcher to determine the ability of the respondent to actually make a meaning of the exercise, contribute meaningfully to the investigation and general impact of respondents' personality on financial innovation adoption (Oloyo, 2001).

a) Distribution of respondents by gender

The attitude and disposition of gender to issue of technology and ICT that under pinned the successful adoption of financial innovation products and services was enquired from the respondents of this study. Majority of the respondents and who returned the questionnaire were male (Table 4.9). Altogether, 57% were male and 43% were female. It could be inferred that more male use banking innovative products than female. This submission tallies with the CBN opinion that there are more male than female banking customers (CBN, 2011).

Table 4.9 Respondents Distribution by Gender

Main factor	Factor level	Frequency	Percentage%
Gender respondents	Male	217	**57**
	Female	165	**43**
Total		**382**	**100**

b)Age distribution of respondents

The study sought to determine the distribution of respondents by age to determine whether age had any influence on financial innovationadoption as was argued by Angle and Perry (1983) and Glisson and Durick (1988) that personal variables such as age, gender, and the level of education among others affected the organizational and personal characteristics.The findings also show that majority(63%) of the respondents were aged between 26 and 40years (Table 4.10). The study findings mean that majority of the respondents are in their middle age (40 years and below) and only 14% of the respondents are above 40 years old. This suggests that more youths patronize banking facilities and are likely inclined to financial innovation adoption than the adults.

Table 4.10 Respondents Age

Main factor	Factor level	Frequency	Percentage (%)
Age bracket	15-25 years	91	24
	26-40 years	244	63
	41-55 years	42	11
	Over 55years	10	3
Total		**387**	**100**

c) Marital status of the respondents

There are more married people (51%) than single respondents (49%). Though the difference is not much, it may suggest element of responsibility and reasonability when perception and value system is factored into financial innovation adoption in Nigeria banks. Only 3% of the respondents were single parents (Table 4.11).

Table 4.11 Respondents Marital status

Main factor	Factor level	Frequency	Percentage (%)
Married status	Married	196	51
	Single	180	46
	Single parent	10	3
Total		**386**	**100**

d) Educational background of the respondents

According to Table 4.12, majority of the respondents were highly educated, having first degree and above (73%). Only about 1% could be considered to have low education. Hence one may deduce that culture of banking is prevalent among educated elite in Nigeria.This is bound to have a ripple effect on financial deepening and inclusion aspect of financial innovation adoption.

Table 4.12 Respondents Educational level

Main factor	Factor level	Frequency	Percentage (%)
Education qualification	Below SSCE	5	**1**
	ND/NCE	199	**26**
	HND/BA/BSC	81	**52**
	Post Graduate	199	**21**
Total		**382**	**100**

e) Earnings per month of the respondents

Evidence from table 4.13 below showed that majority of the respondents (60%) earn less than N400000 per month, while minority 40% earn more than N400000 per month. The income level seems to correlate with academic acquisition. The learned seems to earn better and therefore can afford banking facilities and adventure afforded by adoption of financial innovation. This also tallies with the known characteristics of the youth who form the bulk of the respondents as discovered in**(b)** above.

Table 4.13 Respondents Monthly Earning/Salary

Main factor	**Factor level**	**Frequency**	**Percentage (%)**
Salary per Month (N)			
	Under 10000	117	**30**
	100000-400000	117	**30**
	4000000-720000	80	**20**
	720000- 1500000	51	**13**
	Over 1500000	27	**7**
Total		**392**	**100**

f) Computer literacy level of the respondents

As shown in table 4.14, only 16% of the respondents are not computer literate. This is in tandem with the level of academic qualification of the respondents as revealed in Table 4.12 above, where 71% of the respondents have a minimum of first degree, the tendency for them is to be computer literate. As financial innovation is mostly technology based and knowledge driven, adapting and adoption should not pose problem to them.

Table 4.14 Respondents computer literacy level

Main factor	Factor level	Frequency	Percentage (%)
Computer literate	Yes	331	**84**
	No	61	**16**
Total		**392**	**100**

g) Work experience of the respondents

There seems to be high staff turnover or continual change of employment among the respondents (Table 4.15). Barely 50% of the respondents stayed in a job for more than five years, while only 5% of them have stayed in a job for more than 20 years. This is the current trend in the labour market especially for the highly qualified and computer literate (Poon, 2007), as shown in table 4.14. Financial innovation adoptionassistsqualified professionals' labour mobility.They go with their money without moving their accounts wherever and whenever they go. No location barrier.

Table 4.15 Respondents Work experience

Main factor	Factor level	Frequency	Percentage (%)
Work experience	20 years and above	20	**5**
	15-19 years	31	**8**
	5-15 years	143	**37**
	Under 5 years	61	**50**
Total		**387**	**100**

h) Whether respondent is a financial innovation user or not

Evidence from Table 4.16 showed that age, income, level of academic and computer literacy notwithstanding, 91% of the respondents were financial innovation users and only 9% are traditional banker, who finds it difficult to change.

Table 4.16 Respondents use of financial innovation (User or Non-user)

Main factor	Factor level	Frequency	Percentage (%)
Use of Financial Inovation	User	341	91
	non user	35	9
Total		**376**	**100**

i) Prominent financial innovation used by the respondents

Evidence from Table 4.17 showed that among the users of financial innovation, 52% of the respondents use Automatic Teller Machine, 25% use Electronic Fund Transfer, 7% use Point of Sale terminals, 15% use Mobile (money) Banking and 1% use Internet Banking. ATM is the most popular and IB is the least popular. MB is gaining ground because of the improved telecommunication infrastructure and penetration by service providers (Iwayemi, 2008). This was as displayed in Figure 4.1.

Table 4.17 Respondents disposition to financial innovation products

Product/Service	Frequency	Frequency	Percentage (%)
Prominent innovation use	ATM	200	**52**
	EFT	96	**25**
	POS	25	**7**
	MB	56	**15**
	IB	5	**1**
Total		**382**	**100**

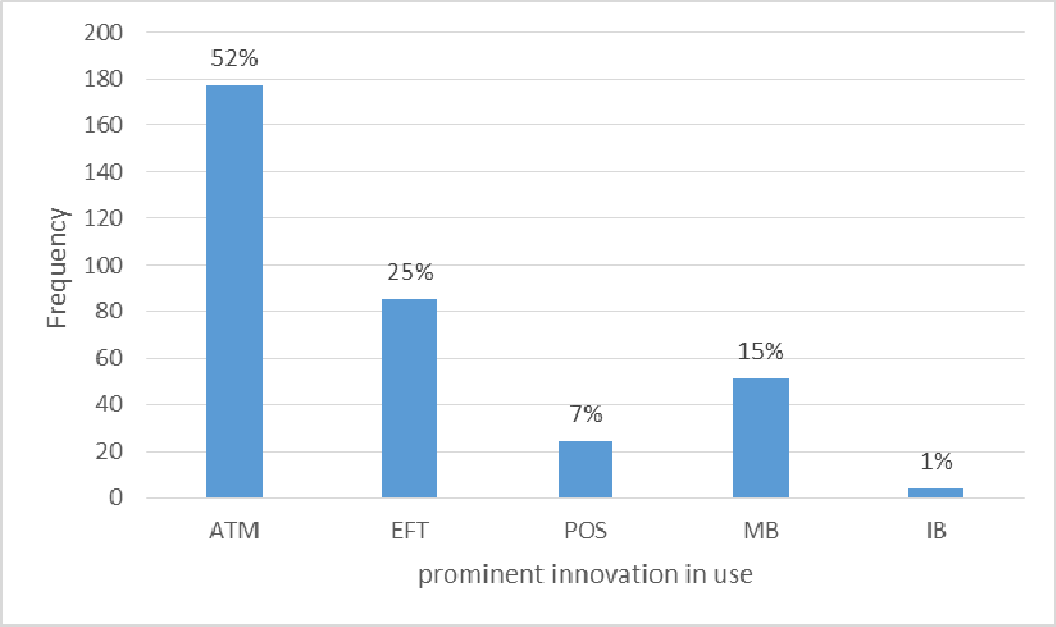

Figure 4.1 Financial Innovation Products used by Respondents

4.5 Descriptive Analysis of Study Variables

This section discusses the descriptive statistics of the study variables on the determinants of the adoption of financial innovation in Deposit Money Banks in Nigeria. The independent study variables discussed were: Financial incentive, Turnaround time, Fraud risk, Transaction cost; and the dependent variables were: Customer Opinion on Financial innovation (Deposit) and Staff Opinion on Financial innovation (Channels).

4.5.1 Effect of financial incentives on financial innovation adoption in Depositmoney Banks in Nigeria

The researcher sought to determine the influence of Financial Incentives on financial innovation adoption in Deposit money banks. The respondents were asked to state their opinion regarding the use of financial incentives. The findings were as presented in Table 4.18. Significant majority, 66% of the respondents agreed that financial innovation products are economical. While 28% are neutral, a total of 6% either disagree

or strongly disagreed. Mean response was about 4 confirming that financial innovation is economical. This showed that financial incentive is available and enticing for as many as 66% of the respondents to patronize and adopt financial innovation.

On whether financial innovation increases status, over 76% of the respondents agreed that financial innovation enhances their status, while 7% disagreed and 17% remained neutral. Mean response was about 4. This is an indication that financial innovation products enhance status and it induces them to adopt FINO. Question was asked on whether interest rate on deposit balance served as bait that induced them to adopt FINO. Majority of the respondents 79% agreed, some 17% of the respondents were neither here nor there, while negligible 3% just disagreed. Mean response was about 4, confirming that interest rate is used as a financial incentive. On whether gifts and special bonuses can entice customers, over 71% of the respondents agreed that gifts and special bonuses can entice the customers, 27% were undecided and 3% refused to concur. Mean response was about 4, confirming that gifts and bonuses can entice customers to adopt innovation.

Question was asked on inability of financial incentives to entice customers. Amazingly 78% of the respondent agreed that incentives cannot buy customers over, rather their freewill can be motivated to adopt. Another 17% were neutral, while 3% disagreed. Mean response was about 4, confirming that financial incentives only cannot be used to entice or buy customers over. On the use of souvenirs, advertisement and product extra features as incentives for enticing respondents. Majority of the respondents 80% agreed. About 18% were neutral while only 2% disagreed. Mean response was about 4, confirming that souvenir, advertisement and products extra features were used as incentives to entice customers to adopt financial innovation respectively.

On the level of awareness for incentive to adopt FINO, majority of the respondents 69%, agreed that they are not aware, while 29% remained neutral, only 2% of the respondent disagreed. Mean response was about 4, confirming that majority of the customers are not aware of the incentive or did not recognize the incentive or its purpose, possibly they

just see it as 'gift'. However, considering the result with other factors discussed, the rate of agreement dropped to 69% this means more works for the banks on incentive awareness and usage as bait for financial innovation adoption growth.

Table 4.18 Respondents opinion on effect of Components/Factors of Financial incentives

Indicators.	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)	Mean
FI1 Financial innovations are economical	2	4	28	46	20	3.79
FI2 Financial innovation products enhance status	2	5	17	49	27	3.94
FI3 Interest rate is used as incentive	0	3	17	51	28	4.04
FI4 Gifts and special bonuses can entice customers	1	2	27	47	24	3.91
FI5 No incentive can induce customers but freewill	1	2	19	49	29	4.03
FI6 Souvenir is used by banks to entice patronage	1	2	18	52	28	4.05
FI7 Advertisement are used to sensitize customers	1	2	17	51	30	4.08
FI8 Extra features are used banks as incentives	1	2	17	50	30	4.06
FI9 Customers are not aware of any incentive	1	1	29	55	14	3.81
AVERAGE	**1**	**33**	**20**	**50**	**26**	**3.97**

Respondents were also asked whether financial incentive is successful in stimulating acceptance and entice customers to adopt financial innovation. The researcher found out that using financial incentive to entice customers is not widely recognized or taken serious by the customers. Respondents saw it as a normal banking culture. However, as far as souvenir and promotion products distribution are concerned, respondents believed that Bankers give them mainly to their personal friends, big or corporate customers. It is only enlightenment campaigns and banners that generally benefit everybody.

Respondents were asked about their preference choice of financial innovation based on financial incentives. Findings from Table 4.19 revealed that 56% of the respondents prefer ATM, 34% preferred POS because of credit enticement given to merchandise, Mobile banking that is now becoming popular with its attractive top up features get 5% and EFT that is mainly used by corporate organizations and international settlement have 3% and the popularity of Internet banking based on financial incentives is only 2%. This means EFT, MB and IB has to be worked on for improvement.

Table 4.19 Respondents preference for financial innovation based on Financial incentives

Dependent Variables	ATM (%)	**POS (%)**	**EFT (%)**	**MB (%)**	**IB (%)**	**TOTAL (%)**
Determinants (factor)						
Financial Incentives	218(56)	132(34)	12(3)	18(5)	7(2)	**387(100)**

Result from Table 4.19 is conveyed in a more visual perspective by Figure 4.2. It demonstrated the findings of the preference of respondents for each financial innovation product based on various financial incentives they were given or received to adopt and patronize. However, though financial incentive influences the adoption of financial innovation but according to the finding of the study, it is to a varying degree per different product of innovation. ATM tops the list with 56%, followed by POS- 34%. IB was the least preferred 2%. The result confirmed that distribution or giving of financial incentives of one kind or the other to the customers can stimulate or boost of financial innovation adoption. This is in accordance to the submission of Yang and Chin (2012)

that a one percent increase in interest rate would induce 12.6% more non-adopter to adopt FINO and a two percent increase in interest rate would make additional 23.3%of non-adopters decide to adopt. Also a #10 sign-up bonus can increase the adoption rate by 19.4%. Therefore, financial incentive appears to be an effective marketing strategy. The work of Sierzchula *et al.,* (2014) in Netherland also confirms this. According to Galande and Fuente, (2003), size of the financial institution is an important factor for the adoption of the financial innovation because the availability of internal funds is important in the large firms that will allow the financing of the investment associated with the innovation process thereby allowing them to inculcate many extra features into financial innovative product or reducing interest charged on credit or increasing interest paid on deposit to entice customers (Lucas, 2005).

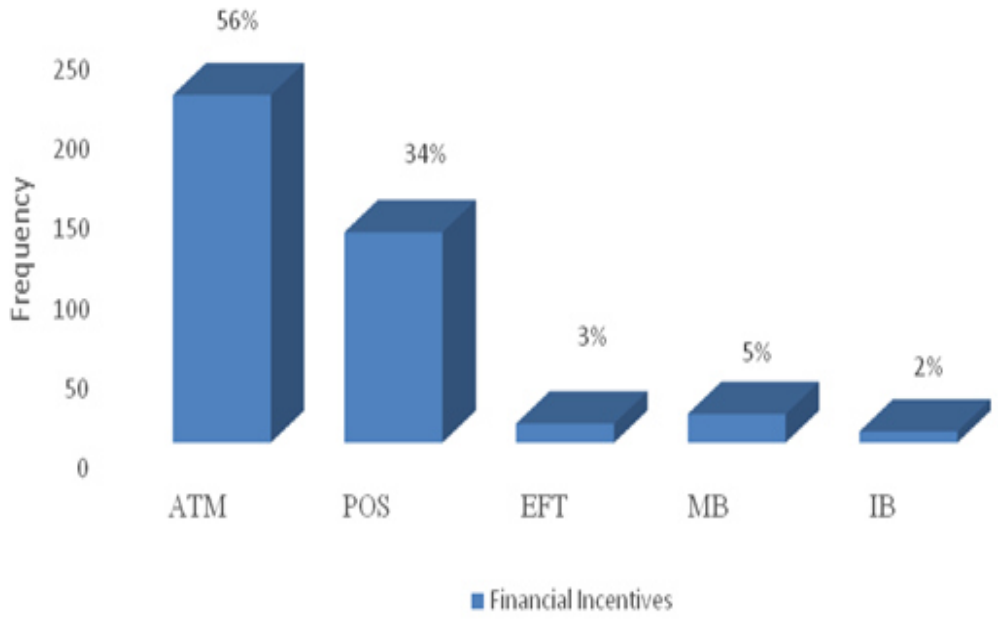

Figure 4.2 Respondents Financial Innovation Preference through Financial Incentives

4.5.2 Effect of fraud risk on financial innovation adoption in Deposit Money Banksin Nigeria

The researcher sought to determine the influence of Fraud and Security risk on adoption of financial innovation in Deposit money banks. The findings of the study are presented in the subsequent sections. Evidence from Table 4.20 showed that when respondents were asked about the safety of releasing confidential information on line to banks, majority 70%, of the respondents agreed, 24% were neutral and less than 6% simply disagreed. Mean response was around 4, confirming that the majority of the customers opined that information is safe with the bank. One would have expected a higher %tage of respondents to agree, since banks always have a duty of secrecy. Majority of the respondents 75% agreed that there is transparency and that accuracy is guaranteed, while 6% disagreed, about 19% remain neutral. This confirmed that majority of the respondents think that accuracy and transparency is guaranteed as mean response was around 4.

However, the extent to which FINO transaction is error free or absolutely accurate was put in doubt by the response to the question that followed on whether robbery incidences and faceless looters abound in FINO transactions, when over 73% agreed, 8% disagreed and 19% were neutral. Mean response was around 4, confirming that majority of the respondents think that robbery, looting and fraud are common place on financial innovation. On whether Network failure gives room to fraud, majority 71% of the respondents agreed that network failure when terminals cannot properly communicate with base server or receive prompt feedback gives room to fraudulent practice, 6% disagreed and 21% of the respondents were neutral. Mean response was also around 4, confirming that majority of the respondents agreed that constant Network failure gives room to fraud. No wonder the high level of fraud and the high amount of loss as a result of fraud or security lapses which makes respondents to cast doubt on safety of financial innovation products.

Respondents were asked if Bank's reputation affects financial innovation adoption, to which majority of over 78% agreed and 4% of the respondents disagreed. Only 18% were neutral. Most responses were also around 4, confirming that majority of the respondents agreed that reputation affects FINO adoption. This response confirmed that bank size, spread and management affects the adoption of financial innovation. On whether volume of litigation on error and fraud, cast doubts on security of FINO, A large proportion of the respondents agreed 73%, 5% disagreed and 22% were neutral. Mean response was about 4, confirming that majority of the respondents agreed that volume of litigation on error and fraud, cast doubts on security of FINO. This goes to confirm that the incidence and burden of fraud and security risk is real and detrimental to the adoption of FINO (Ovia, 2005).

The respondents were asked about impact of literacy level on fraud perpetration. The finding from Table 4.20 showed that majority of the respondents 80% agreed while 3% disagreed that low level literacy (academic and computer) contributed to fraud perpetration, and the remaining 17% of the respondents were indifferent. Mean response was 4, confirming that majority of the respondent agreed that low academic and computer literacy level contributed to the perpetration of fraud on financial innovation. The import of this is that fraudsters exploit opportunity of low literacy level to carry out their act. On refund procedure for genuine mistakes, majority of the respondents 80% agreed that it is frustrating. While 3% disagreed, another 17% remained silent. Mean response was also 4. This confirmed that majority of the respondents are of the opinion that refund procedure for genuine mistake is frustrating.

Banks foot drag in making refund of genuine error. Justice delayed is justice denied. This frustrates genuine customers as it may connote fraudulent tendency and support sharp practice. However, on another question on whether bank size and spread / location strategy safeguard fraud, majority, 78% of the respondents agreed, with only 3% dissenting and 19% of the respondents abstained. Most response was 4. That means majority of the respondents agreed that bank size and location strategy safeguard fraud. Little wonder when asked about general security of financial innovation products, about

73% of the respondents agreed that financial innovation is well secured, 4% disagreed, while 23% of the respondents were indifferent. Mean response was 4, which means despite all, majority of the respondents still concur that financial innovation is secured. But banks must watch it, because banks reputation and associated benefits of FINO can be rubbished and eroded with persistent fraud.

An open question was asked about how long it takes to rectify errors. The respondents answer varies between hours and days. However, respondents generally believed it takes too long to respond to or correct genuine errors at times weeks. In their own opinion corrections should be instantaneous. Customers become restless and more suspicious of fraudulent intentions whenever there is a delay in correcting errors or prompt refund.

Table 4.20 Respondents opinion on effect of Components/Factors of Fraud risk

Fraud risk	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)	Mean
FR 1. Confidential information is safe	1	4	24	52	18	3.82
FR 2. Transparency and accuracy are guaranteed. No errors	2	4	19	55	20	3.88
FR 3. Many robberies and faceless looters abound	1	7	19	52	21	3.86
FR 4. Network failure gives room to fraud	1	5	23	51	20	3.84
FR 5. Banks reputation affects Financial innovation adoption	1	3	18	56	22	3.96
FR 6. Volume of litigation on error and fraud, cast doubts on security of FINO	1	4	22	51	22	3.91
FR 7. Low literacy level contributes to fraud perpetration	0	3	17	61	19	3.97
FR 8.Refund procedure on genuine error is fraustrating	1	2	18	56	24	4.01
FR 9. Financial innovation is well secured and fraud free	0	4	16	60	21	3.97
FR 10. Bank size and distribution strategy safeguard frauds	0	3	18	49	29	4.04
FR 11. FINO products are totally fraud resistant	1	3	23	51	22	3.90
AVERAGE	**1**	**4**	**22**	**53**	**22**	**3.92**

Based on Fraud risk, respondents were asked for their preference on financial innovation products. Contrary to expectation, despite high level of frauds, errors and robberies associated with ATM, findings from Table 4.21 showed that 65% of the respondents still preferred ATM, followed by IB 12%, EFT 9%, POS and MB 7% each. This trend might change as respondents become more familiar with other financial innovation products and the products become more popular and affordable. This means income and sophistication of the respondents has role to play, as well as the state of developmental infrastructures.

Table 4.21 Respondents preference for financial innovation products based on Fraud risk

Dependent Variables	**ATM (%)**	**POS (%)**	**EFT (%)**	**MB (%)**	**IB (%)**	**TOTAL (%)**
Determinants (factor)						
Fraud Risk	**252 (65)**	**28 (7)**	**35 (9)**	**29 (7)**	**45 (12)**	**389 (100)**

Evidence from Figure 4.3 show a graphical representation of Table 4.21, which convincingly showed the degree of preference among the FINO products based on fraud and security risk. The table show that 65% of the respondents preferred ATM, followed by IB 12%, EFT 9%, POS and MB 7% each. Respondents seem to prefer ATM despite the fact that it appears to be the most fraudulent and security risk laden. One would have thought that the level of security risks often associated with ATM would have deterred its preference. The finding result proved contrary to expectation, despite high level of frauds, errors and robberies associated with ATM. This trend might change as respondents become more familiar with other financial innovation products and the products become more popular and affordable, e.g. computer hardwares and telecommunication facilities.

Security can be interpreted differently by different people. Respondents who are more concerned about their financial loss (those who view cash as risky) are more likely to adopt bank account number payments, while those who are more concerned about loss

of their personal information (those who view cash as secure) are less likely to adopt bank account number payments. However, as security on FINO generally improves, fraudulent practices will be tightened up. Customers are afraid of security issues (Ezeoha, 2005). According to Kondabagil (2007) security is a major problem facing customers whenever they make online transaction. In a study conducted on internet users by Zhou, Lu and Wang (2010), it was found that users are concerned about privacy when they are online. In another research conducted by Besavros (2000) it was found that, consumers are always reluctant to share their information online due to fear that their financial life will be open to the internet universe. Gaining the confidence of customers is of paramount importance to service providers and if not well managed could discourage users and could encourage negative spread of information which could pull back intending customer. Customers' security is one of the very important factors in determining the decision of consumer to use financial innovation (Cooper, 1997). This is also confirmed by Olaoye and Dada (2014) who attested that fraud riskis amajor deterrent to financial innovation adoption.

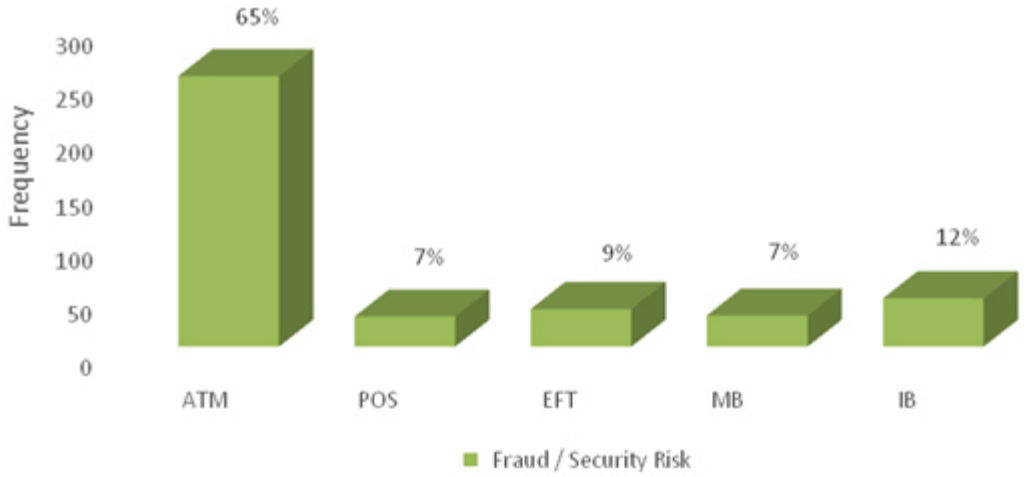

Figure 4.3 Respondents' Financial Innovation Preference based on Fraud Risk

4.5.3 Effect of Turnaround time on financial innovation adoption in Deposit Money Banks in Nigeria

The researcher sought to determine how turnaround time affects the adoption of financial innovation in deposit money banks. The respondents were asked the level of their agreement with turnaround time factors associated with financial innovation adoption. The findings were as presented in Table 4.22 that followed. On the availability of varieties of financial innovation products thereby reducing queue in the banks and saving precious time, 44% of the respondents agreed and 36% strongly agreed. Only 15% of the respondents were neutral, 4% disagreed and balance 1% strongly disagreed. The mean response was 4. This mean availability of option in FINO and varieties to choose from in effecting a transaction saves time to stay on queue waiting to be served. A total of 51% of the respondents agreed that learning about financial innovation products is made easy which in turn saves a lot of time in handling transactions. 29% of them strongly agreed, 2% disagreed and 18% are neutral.

Respondents were asked about interrogation and delay associated with banking, 52% of respondents agreed that financial innovation removed unnecessary interrogation and delay by bank officials. Only 28% strongly agreed and 17% were undecided but 3% disagreed. The mean response was 4. This means a lot of time wasted in face to face attention and meetings are removed. Follow on to this question was a question on time and space management, where 30% of the respondents strongly agreed that with FINO facilities are available 24/7 everywhere, time and space barrier are removed as they can carry out their banking financial transaction at any location and at anytime while 52% also agreed to this, about 3% disagreed and 17% remained neutral. About 82% of the respondents either agreed or strongly agreed with the question that young professionals (Yupees) and corporate organizations adopt and patronize FINO because they are time conscious, while 19% were either neutral, disagreed or strongly disagreed. Some 80% of the respondents opined that modern banking is faster than traditional banking, while 17% were undecided and 3% think otherwise.

Question was asked on the relevance of timing banking service. Findings from Table 4.22 showed that 17% of the respondents strongly agreed it is a fruitless effort, 66% also agreed is fruitless, while 20% do not know the essence or care less. However the majority who agreed must have seen banking as part of daily life. Innovation and time consciousness is integral part of banking. When respondents were asked on the duration of time taken to be served, there is a wide variation in time spent or taken to complete a transaction, ranging from 5mins to 3hours, at times two days depending on type of transaction and availability of network and power supply. At times it could be chaotic but things are getting better and faster especially with the restructuring of National power generation and distribution and licensing of more telecommunication service providers (Iwayemi, 2008).

Table 4.22 Respondents opinion on effect of Components/Factors of Turnaround time

Turnaround Time	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)	Mean
TT1 Varieties of innovative products nulliFIes need to queue	1	4	15	44	36	4.11
TT2 Learning the use of Financial innovation is easy and saves time	0	2	18	51	29	4.06
TT3 Operational delays and interrogations are removed	0	3	17	52	28	4.04
TT4 Time and space barriers removed	1	2	17	52	30	4.08
TT5 Yuppes and Corporate customers are main targets	1	2	16	56	26	4.04
TT6 Modern banking is faster than traditional banking	1	2	17	54	26	4.04
TT7 Timing banking service is a fruitless effort	1	1	15	66	17	3.97
AVERAGE	**1**	**2**	**16**	**54**	**27**	**4.05**

Respondents were asked on their preference in financial innovations product based on Turnaround time. The following findings and evidence revealed in Table 4.23 showed that as far as turnaround time is concerned 57% preferred ATM, followed by POS 18% and MB 14%. This preference may have to do with what the customers are used to. As the products get more popular and recognized, there might be improvement. The import of this is that the banks have more works to do on public enlightenment and product awareness

Table 4.23 Respondents preference for Financial innovation based on Turnaround time

Dependent Variables ATM (%)	**POS (%)**	**EFT (%)**	**MB (%)**	**IB (%)**	**TOTAL (%)**
Determinant (Factor)					
Turnaround Time	**225 (57)**	**72 (18)**	**30 (8)**	**55 (14)**	**10 (3)**	**392 (100)**

Evidence from findings as shown in Table 4.23 on the preference of financial innovation products based on turnaround time is displayed clearly in Figure 4.4. Customers enjoy self-service, freedom from time and place constraint, and reduced stress of queuing in banking hall. Therefore, time and cost savings as well as freedom have been found to be the main reasons underlying banking financial innovation adoption. This is in tandem with Auta (2010) submission.

However, not all bank customers engage in the use of financial innovation. There are multiple reasons for this, amongst which are customers need to have an access to the internet in order to utilize some financial innovation facilities such as Internet and Mobile banking facilities, furthermore, most new online users need first to learn how to use the service. Nonusers often complain that online banking is incomprehensible, difficult to use and has no social dimension, i.e. the lack of face-to-face situation at branch (Karjaluoto *et al.,* 2002; Mattila, 2003). Auta (2010), identify time factor as one of the prime factor that features in e-banking service quality for the customers. Saving

time is an importance factor which influences the customers' preference to use e-banking (Beer, 2006). Real time transaction is very crucial with financial innovation.

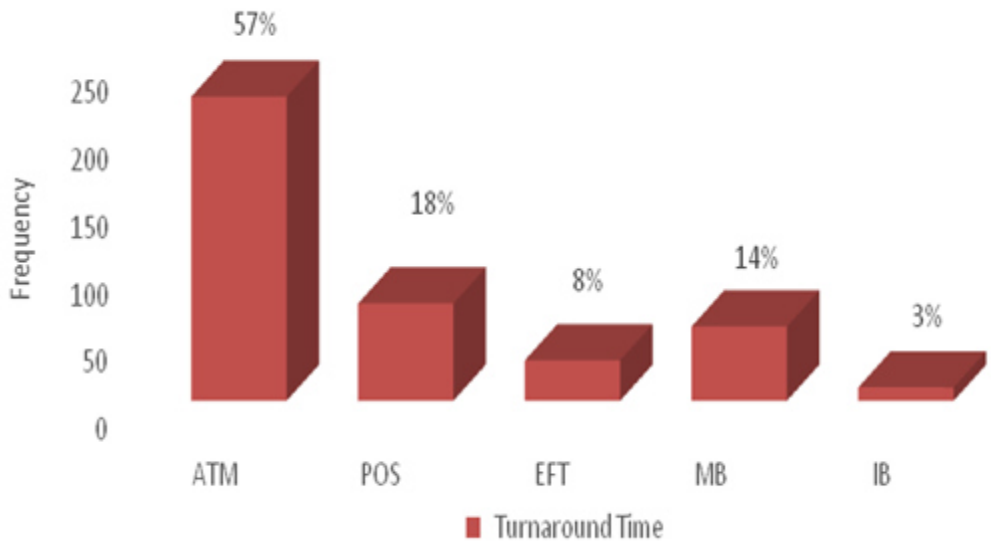

Figure 4.4 Respondents' Financial Innovation preference based on Turnaround Time

4.5.4 Influence of Transaction cost on financial innovation adoption in Deposit Money Banks in Nigeria

The researcher sought to determine the influence of transaction cost on adoption of financial innovation in Deposit money banks. Advocates of financial innovation have always premise their arguments on cost and benefits analysis. Respondents were asked questions about associated costs of financial innovation, about utility/usage charges, initial / subscription charge, and annual charge. Findings from Table 4.24 confirmed that 79% of the respondents agreed that these charges are unnecessary and discouraging, another 3% disagreed and 18% were indifferent. Most response was about 4, confirming that majority of the respondents agreed that charges were exorbitant, unnecessary and discouraging. This may be due to the fact that ordinarily they are bank customers, who pay for keeping and running the account with the bank therefore, these charges look like extra charge or double charge for using FINO facilities. May be that is why in the next question, majority of the respondents 78% agreed that customers are funding FINO asset

acquisition and staff training on financial innovation. Though 3% of the respondents think otherwise and 19% of them were undecided.

On making financial innovation accessible and infrastructure running cost, about 77% in each case agreed that the enormous cost passed to the customers discourages financial innovation adoption. These views were not supported by 4% of the respondents in each case and 18% each, also abstain respectively. The fact that for either of the questions, the mean response was also 4 each confirmed that the customers are discouraged by enormous cost bearing on financial innovation. Question was asked on switching cost (interoperationability and interconnectivity) of facilities. Finding of the study as displayed in Table 4.24 showed that 71% of the respondents agreed that that discomfort and high cost experienced on this discourages innovation adoption, while 25% of the respondents undecided, another 4% disagreed. With the mean response at 4, it is confirmed that majority of the customers agreed that switching or interoperation of facilities are costly. The deduction from this is that customers would have preferred homogenous financial innovation product with no restriction to acceptability in any bank.

Customers are becoming cost conscious and cost increase resistant as shown by the finding on last question on Table 4.24. That deliberate financial deepening and inclusion has cost implication. Majority of the respondents 79% agreed, 19% were neutral and 2% disagreed. Of course as seen in previous questions, this cost implication might have to be borne by the customers. This has been found to discourage financial innovation adoption. When respondents were asked about being pressurized by bank to bear unnecessary cost of innovation as a result of forcing unsolicited products on them, the respondents, over 93% were together in disagreeing. The respondents strongly believe that they are in the driving seat. They have the weapon and right of choice. No bank can enforce any product on them to patronize or transfer unreasonable cost to them to carry. But they all agreed that though costly, the impact of financial innovation is tremendous and it add value because it is more convenient.

Table 4.24 Respondents opinion on effect of Components/Factors of Transaction cost.

Transaction cost	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)	Mean
C1 Charges are unnecessary burden	0	3	17	59	20	3.96
TC2 Asset acquisition and staff are borne by customers	1	2	19	55	23	3.98
TC3 Cost of making Financial innovation acceptable reduces adoption	1	4	18	57	20	3.94
TC4 Infrastructure running cost is enormous	2	3	18	48	29	4.04
TC5 Switching costs discourage Financial innovation adoption	1	3	25	47	24	3.91
TC6 Deliberate Financial deepening policies has cost implication	0	2	19	61	18	3.94
AVERAGE	**0**	**4**	**19**	**55**	**22**	**3.96**

Using Transaction cost as basis for determining respondents' preference for financial innovation products, the researcher found that that there was a relatively fair distribution

of opinion as far as transaction cost is concerned (Table 4.24). It is only Internet Banking that has lowest respondents' preference of 16%, all others are around 20%. It is either that the products are generally costly or cost of transaction is relatively high. There is also the probability of products' awareness and popularity underpinning this opinion. Opinion about transaction cost and preference seems fairly same for all products.

Table 4.25 Respondents Financial innovation products preference based on Transaction Cost

Dependent Variable	ATM (%)	POS (%)	EFT (%)	MB (%)	IB (%)	TOTAL (%)
Determinant (factor)						
Transaction Cost	80 (21)	85 (23)	78 (20)	77 (20)	60 (16)	380 (100)

A graphical display of Table 4.25 as shown by Figure 4.5 showed fair distribution on transaction cost perception. Cost as far as all the products are concerned was fairly shared and constant. The difference in cost pattern did not reveal a major disparity. Though POS seems to take the lead as far as respondents' preference is concerned on transaction cost basis 23%, IB is still the least preferred on transaction cost basis 16%. Summation on the above revealed that customers still feel that financial innovation generally is costly. Cost consideration is an essential ingredient in consumers market. When a consumer considers a product to be costly, he looks for the nearest alternatives and switches to the next substitute. Financial cost considerations were the major setback with regards to customers' adoption of innovative banking services (Agbemabiese*et al.*, 2015). Bong-Keun and Yoon (2013), opines that transaction or financial cost have a significant impact on customers behavioral intention towards mobile banking usage and adoption. Little wonder why Premkumar*et al*., (1994) concluded that cost is the most important variable in the context of innovation.

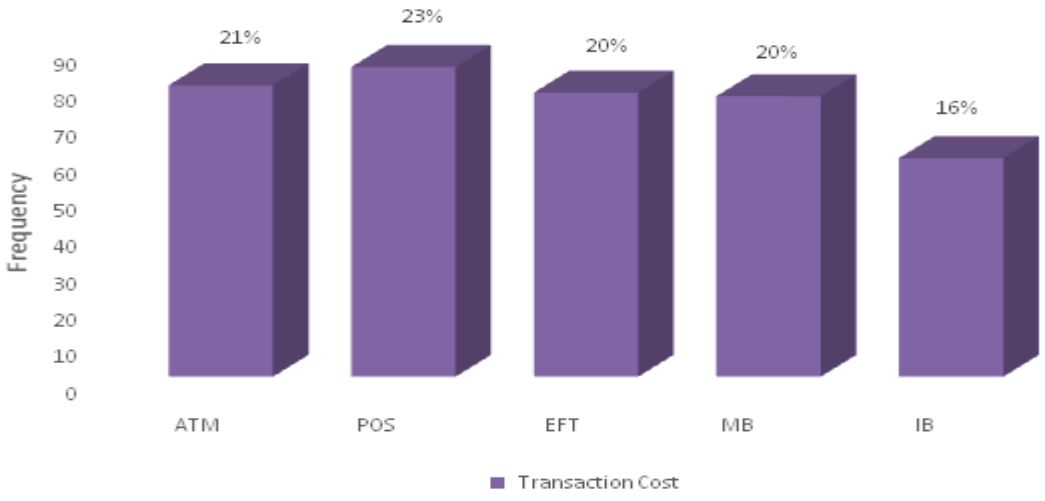

Figure 4.5 Financial Innovation products preference through Transaction Cost

4.5.5 General Customers Opinion on Financial innovation adoption (Deposit Base)

Customer Respondents (243), were asked whether social status or peer group pressure, influence their adoption of financial innovation, a few numbers of respondents disagreed 9% and another 4% strongly disagreed. However, majority of the respondents still agreed 50% with another 17% strongly agreed. A question on preference within traditional and innovative banking revealed that 52% agreed that innovative banking is preferred but a total of 11% showed dissent by either disagreeing or strongly disagreed. On the influence of the general state of infrastructure effect on adoption of financial innovation, 41% of the respondents agreed to this assertion while 8%strongly disagreed and another 9% just disagreed. The improvement in the level of disparity may be due to recent privatisation of electricity and liberalization of telecommunication service providers.

On the issue of availability of information, public enlightenment and awareness on financial innovation, only 4% of the respondents thought information are not adequate enough, while over 80% of them agreed on the adequacy and availability of information on financial innovation but 17% did not comment as revealed in Table 4.26. From revelation above, as the state of infrastructure is improving, with sustained public enlightenment, in as much as the respondent prefers innovative banking, the rate of

financial innovation adoption is expected to improve. Consequently, as the rate of financial innovation adopton improves, more customers will be drawn into banking (finance deepening and inclusion), thereby swelling up banks' customers and deposit base. This is in tandem with the submission of Agboola (2006) on impact of electronic banking in Nigeria.

Table 4.26 General Customers' opinion on Components/Factors of Financial innovation

Factors/ Components	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)	Mean
COFI1 Social status sinfluence decision on adoption of FINO	4	9	20	50	17	3.67
COFI2 Customers familiar with mortal banking than space banking	4	7	20	52	17	3.70
COFI3 State of infrastructure inhibit Financial innovation adoption	8	9	20	41	22	3.61
COFI4 Innovative banking is more secured and fraud free	2	8	23	48	18	3.71
COFI5 Adequate information on use, benefits and availability of FINO	1	3	17	55	25	4.00
AVERAGE	**4**	**7**	**20**	**49**	**20**	**3.74**

4.5.6 General Banks' Staff opinion on financial innovation (Instrument/Channels)

From the onset of the discussion on Table 4.27, the position of the Banks' staff respondents (148) must be appreciated. They are out to market their products, justify their policies and defend their respective departments. The opinion expressed though may be biased, but contained some intrinsic value that should not be glossed over. The

summation of their response to specific questions as revealed by the findings will be given in summary. Over 69% of the staff respondents agreed that income level is not relevant to adoption of financial innovation. This means the attitude of concentrating on the 'rich' is changing, giving way for aggressive product marketing and market penetration. About 65% of them agreed that operating financial innovation service is flawless and no security compromise, but why are there many successful litigation cases and claims? Decision could be taken between the lines. 79% of them agreed that interest rate, as an incentive could be successful but very sensitive especially as far as over all bank performance is concerned.

On question of influence of size capital base and spread, 74% of the respondents agreed that no cause for alarm or fear with financial innovation adoption.This is in agreement with Soludo (2008). Capital base has a major role to play in Banks survival, but in the recent time many big banks have failed in Nigeria, the government had to organize bail out for many cases in point were Intercontinental bank Plc and Oceanic Bank Plc that collapsed due to fraudulent practices and Union Bank Plc that had to be bailed out by the government and restructured by CBN. Majority or these banks staff respondents (69%) however warned that financial innovation as a marketing strategy for financial deepening and competition has cost implication which of course will eventually be bornebycustomers. Moreso despite reputation, spread and size, to make financial innovation more acceptable, banks must reduce charges cost and improve core competence to make proliferation of financial innovation acceptable and more adoptable by customers Auta (2010).

Table 4.27 General Banks' Staff opinion on Components/Factors of Financial innovation

Factors/ Components	Strongly Disagree (%)	Disa gree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)	Mean
SOFI1 Income level relevant in Financial innovation adoption	4	10	17	49	20	3.71
SOFI2 Financial innovation flawless, no security compromise	3	12	20	47	18	3.65
SOFI3 Incentives like interest rate can improve adoption of FINO	2	5	15	56	23	3.93
SOFI4 With FINO penetration strategy, no cause for alarm	1	6	19	52	22	3.89
SOFI5 Financial deepening and inclusion comes with costs	1	4	18	54	24	3.96
SOFI6 FINO products are totally fraud resistant	4	9	17	47	22	3.73
AVERAGE	**3**	**7**	**18**	**50**	**22**	**3.81**

4.5.7 General Summary of Descriptive Analysis

A cursory look at Table 4.28 showed that from the opinion and findings from the respondents, ATM is the most popular, most known and most sought after. This is also in tandem with finding of Joshua (2010), in Ghana. POS comes next probably because of incentives given to the corporate customers (merchandise) and of course little or no direct cost paid by the customers who use the POS to the merchants or banks. The EFT seems to be specially made for the corporate organization or for moving sizeable funds,

while Internet Banking is reserved for the Yuppes and sophisticated. With Licensing of new operators, Mobile Banking is now getting recognized and it is hope that with further liberation of Nigerian economy and sustained infrastructural development, things will get better. Generally adoption of ATM has no problem, being the most popular. However, it can also get better. But more work is needed to improve the adoption of POS, MB, IB and EFT if Nigeria Money Deposit Banks are to be relevant in the global financial order otherwise they will lose their business to foreign banks who daily besiege the CBN for operating and practicing license.

Financial innovation adoption is based upon meeting the needs of the customer, a view supported and conveyed in Mols, Bush and Nelsen (1999). Nyangosi and Arora (2011) argued that financial institutions only embrace different electronic channels just to meet the demand of the customers. Woldie *et al.,* (2008) rightly observed: "It is one thing to innovate, but entirely another thing for the innovation to be accepted by consumers''.

Table 4.28 Summary of Respondents Preference and rating of Factors/ Determinants of Financial Innovation Adoption

Dependent Variables	**ATM (%)**	**POS (%)**	**EFT (%)**	**MB (%)**	**IB (%)**	**TOTAL (%)**
Determinants (factors)						
Financial Incentives	218(56)	132(34)	12(3)	18(5)	7(2)	**387(100)**
Turnaround Time	225(57)	72(18)	30(8)	55(14)	10(3)	**392(100)**
Fraud Risk	252(65)	28(79)	35(9)	29(7)	45(12)	**389(100)**
Transaction Cost	80(21)	85(23)	78(20)	77(20)	60(16)	**380(100)**

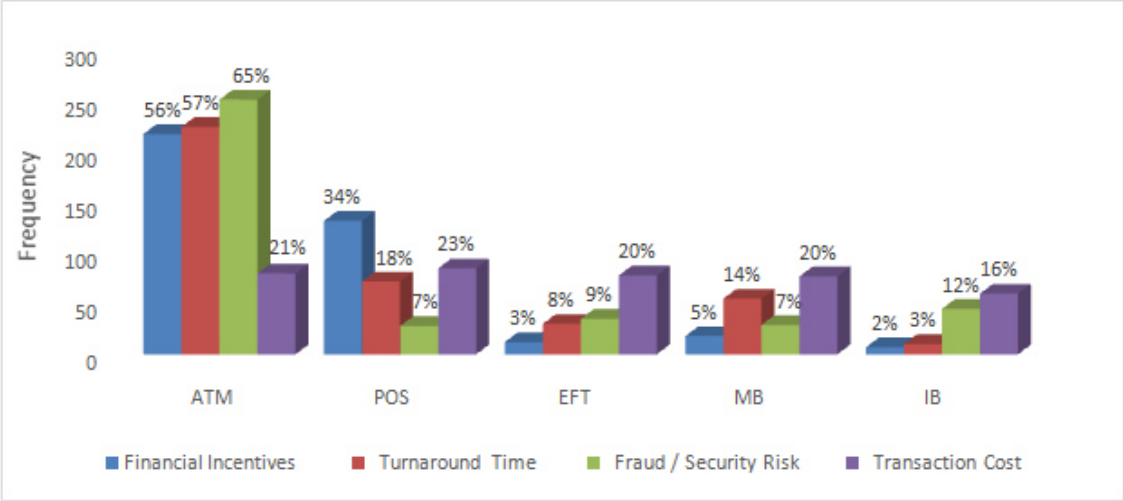

Figure 4.6 General Summary of Financial Innovation adoption as per Independent variable (Determinant of adoption) and lead determinant per product

According to the general findings on descriptive analysis of primary data (Table 4.28) and evidence conveyed by graphical representation in Figure 4.6. Financial innovation adoption by respondents (customers) can be summarized in the following ways:

Amongst independent variables (Determinant factors):

Based on Financial incentives - ATM is the most preferred - 56%.

Based on Fraud risk - ATM is the most preferred - 65%.

Based on Turnaround time - ATM is the most preferred - 57%.

Based on Transaction Cost - POS is the most preferred- 23%.

Amongst dependent variables (Financial innovation channels/products):

Automatic Teller Machine (ATM)-Fraud risk is the lead determinant- 65%

Point of Sales terminals (POS) - Financial incentive is the lead determinant - 34%

Electronic Fund Transfer (ETF) -Transaction cost is the lead determinant -20%

Mobile Banking (MB) - Transaction cost is the lead determinant -20%

Internet Banking (IB) - Transaction cost is the lead determinant -16%

It could thus be concluded that according to evidence from descriptive analysis from primary data, ATM is the most widely adopted and patronized financial innovation. The

lead determining factor based on respondents' measure of preference is fraud/ security risk. Financial incentive takes the lead for respondents' reason of preference with POS. However, Transaction cost leads the table on reason of preference among the other three remaining products- EFT, MB and IB. Though Turnaround time was not preferred as a lead determinant for any of the financial innovation products, this is not to say that turnaround time is not relevant or important, but that other determinants are more recognized by the respondents or that turnaround time has been taken for granted for all the products.

Having done with the descriptive analysis, the study considered inferential analysis on the data collected on each component of dependent variable (FINO) vis-à-vis each of the independent variables (the determinants of financial innovation adoption) using correlation analysis and multinomial logistic regression as the tools and model for the study. Necessary diagnostic tests were carried out on the variables before the analysis.

4.6 Diagnostic Tests

4.6.1 Reliability Tests

The findings in Table 4.29 indicate the overall summary of the factor analysis for all the variables. Financial Incentives (FI) had a coefficient of 0.756, Fraud/Security Risk (FR) had a coefficient of 0.861, Transaction Cost (TC) had a coefficient of 0.817and Turnaround Time (TT) had a coefficient of 0.767. The dependent variable; Financial Innovation Adoption (Customers' opinion (instruments) and Staff opinion (technology) FINO) were subjected to factor measurement analysis. Customers Opinion on FINO Instrument had a coefficient of 0.786 and Staff Opinion on FINO Technology with a coefficient of 0.854. In conclusion, all the constructs had Cronbach's Alpha above the minimum acceptable reliability coefficient of 0.7 and thus considered all the variables reliable and accepted for investigating purpose.

4.6.2. Heteroscedasticity

Heteroscedasticity in a study usually happens when the variance of the errors varies across observation, Long and Ervin (2000). Breusch-Pagan was used to test the null hypothesis that the error variances are all equal versus the alternative that the error variances are a multiplicative function of one or more variables. Breusch-Pagan tests the null hypothesis that heteroscedasticityis not present. If sig-value is less than 0.05, reject the null hypothesis. A large chi-square value greater than 9.22 would indicate the presence of heteroscedasticity (Sazali, Hashida, Jegak & Raduan, 2010). In this study, the chi-square value was 7.114 indicating that heteroscedasticity was not a concern.

Ho: Constant variance

Variables: Financial innovation (FI), Fraud risk (FR), Turnaround time (TT) and Transaction Cost (TC)

Table 4.30 Breusch-Pagan for Heteroscedasticity

Ho	Variables	Chi2(1)	Prob > Chi2
Constant Variance	FI , FR, TT and TC	7.114	0.130

4.6.3 Multicollinearity

The standard issue in multicollinearity is that, the standard errors and thus the variances of the estimated coefficients are inflated when multicollinearity exists (Simon, 2004). Test for multicollinearity among study variables was conducted using Tolerance and Variance Inflation Factor (VIF). Variance Inflation Factor was checked for evidence of multicollinearity where their numerical values were all well below the cut-off value of 10 suggested by Neter, Kutner, Wasserman and Nachtsheim (1996). Gujarat and Porter (2010), view that as a rule of the thumb if VIF of independent variables exceeds 10, that variable is collinear. Based on this rule of the thumb, there was no collinearity among the independent variables. From the results, inspection of the Variance Inflation Factors (VIFs) showed that multicollinearity was not a concern. No variable was observed to

have VIF value above 10 and no tolerance statistic was below 0.100 as suggested by Hamilton (2006). This hence led to a conclusion that no predictor had a strong linear relationship with any of the predictor(s).

Table 4.31 Multicollinearity Test for the Study Variables

Variables	Items	Collinearity Statistics	
		Tolerance	VIF
Financial Incentives(FI)	**9**	0.859	1.165
Fraud Risk(FR)	**11**	0.658	1.520
TurnaroundTim(TT)	**6**	0.982	1.018
Transaction Cost(TC)	**5**	0.537	1.862

4.6.4 Model Fits

To assess the model fit, goodness of fit statistics such as the overall model chi-square, log-likelihood values, and pseudo- r2 values were examined. These statistics provided evidence of a good model fit (i.e. have values close to 1). While multinomial logistic regression does compute these measures to estimate the strength of the relationship, these correlation measures alone do not provide sound evidence for determining and estimating the accuracy or errors associated with the model. Moreover, the overall model chi-square, log likelihood values, and pseudo- r2 values can become quite large for data with large weights and this results in the generalized r-square almost always being 1. Model converge (χ^2 = 776.597, df =16, p =0.000) and The Goodness of fit was (McFadden=0.240)=24%.

Table 4.32 Model Fitting Information

Model	Model Fitting Criteria -2 Log Likelihood	Likelihood Ratio Tests Chi-Square	Df	Sig.
Intercept Only	3023.515			
Final	2246.918	776.597	16	.000
Pseudo R-Square				
Cox and Snell		0.482		
Nagelkerke		0.515		
McFadden		0.24		

Likelihood Ratio Tests

Effect	Model Fitting Criteria -2 Log Likelihood of Reduced Model	Likelihood Ratio Tests Chi-Square	Df	Sig.
Intercept	2313.961	67.042	4	0
Financial incentives	2317.088	70.17	4	0
Fraud risk	2722.424	475.506	4	0
Turnaround time	2326.443	79.525	4	0
Transaction cost	2266.073	19.155	4	0.001

4.6.5 Autocorrelation Test (Time series Test)

A key assumption in regression is that the error terms are independent of each other. In this section the result of the test to determine whether there is autocorrelation (serial correlation), i.e. where there is a (linear) correlation between the error term for one observation and the next using Durbin-Watson test is presented. This is especially relevant with time series data where the data are sequenced by time. According to Cochrane, (1997), a value of $d = 2$ means there is no autocorrelation. Therefore the result proved that there is no auto correlation in the 10 years secondary data as shown in Table 4.33 below.

Table 4.33 Autocorrelation Result

Test	Durbin-Watson
Value	**2.024**

4.6.6 Normality Tests

Inferential statistics are meant to infer whether there is underlying relationship within the respective variables for purposes of sequential analysis. The dependent variable was subjected to normality to check whether the data provided was normally distributed or not. A simple way to evaluate how far data is normal is to test for one sample Kolmogorov-Smirnov or Shapiro-Wilk test, then plot normal Q.Q or P-P for the dependent variable to confirm the obtained result (Garson, 2012). For one to fit a linear model to some given data, the dependent variable (financial innovation) has to be normally distributed.

4.6.6.1 Shapiro-Wilk Test

Normality of data was tested by use of Shapiro-Wilk test. This test for normality was developed by Shapiro and Wilk in 1965. It has been found to be the most powerful test in most situations (Richardson & Smith, 1993). The test is not calculated when a frequency variable is specified. It is mostly used for evaluating the assumption of univariate normality by taking the observed cumulative distribution of scores and comparing them to the theoretical cumulative distribution for a normally distributed variable. The null and alternative hypotheses were stated as follows:

H_0: The data is not normally distributed

H_1: The data is normally distributed

The rule is that if the p-value is greater than 0.05, H_0 is not rejected and H_1 is rejected, if the p -value is less than 0.05, H_0 is rejected and H_1 is accepted. The tests results show that the p-value = 0.066 > 0.05 as shown in Table 4.34.The test reject the hypothesis of normality when the p-value is less than or equal to 0.05, confirming that the standardized residuals was significantly normally distributed (Asghar & Saleh, 2012).

Table 4.34 Normality Test Result

		Shapiro-Wilk Statistic	Df	Sig.
Financial adoption	Innovation	.855	10	.066

4.6.6.2 Normal Q-Q/ P-P Plots

This is a graphical procedure that plots the observed values on the X-axis and the expected values (assuming a normal distribution) on the Y-axis. If the sampledistribution is distributed exactly like a normal distribution, the points should fall on a straight line. P-P Plot may be used in place of Q-Q Plot if cumulative data – Probabilities were used as against direct observed data- Quantiles in Q-Q Plot The null-hypothesis of this test is that the population is normally distributed. Thus a Q–Q plot or P-P Plot may be required for verification in addition to the test.

Normal P-P Plots: These are similar to Q-Q plots, but instead of plotting observed values, these plot cumulative probabilities (values range from 0 to 1), with observed probabilities (cumulative proportion of cases) on the X-axis and expected probabilities given the normal curve on the Y-axis. If the sample were exactly normally distributed, the points would lie on a straight diagonal line:

4.6.7 Regression Results

This section discusses the regression results derived from the collected data and models. It starts with results of the correlation model and the proceeds to results of the multinomial models.

4.6.7.1 Correlation Results

The study conducted correlation analysis to test the strength of association/relationship between the research variables from the primary data using composite value, hence the use of Pearson's Correlation Coefficient. Correlation is the measure of the relationship or association between two continuous numeric variables (Kothari, 2004). Correlation

indicates both direction and degree to which research variables co-vary with one another from case to case without implying that one is causing the other. Correlation analysis results give a correlation coefficient which measures the linear association between two variables, moreso when figure/data is in composite form (Crossman *et al.,* 2013). The value of correlation coefficient ranges between -1 and +1. A correlation coefficient of +1 indicates that two variables are perfectly related in a positive linear. A correlation of -1 indicates that two variables are negatively linearly related and a correlation coefficient of 0 indicates that there is no linear relationship between two variables.

The findings of the study are presented in Table 4.35. The results of the correlation analysis presented in the table show that financial incentives was positively related to the fraud risk with a Pearson's Correlation Coefficient of r = 0.375 and at level of significance of 0.000, was statistically significant as the p-value is less than 0.05. This relationship was moderately strong. The results show that turnaround time was positively correlated to financial incentives a Pearson's Correlation Coefficient of r = 0.497 and at level of significance of 0.000, was statistically significant as the p-value is less than 0.05. The relationship was however, not very strong. The findings of the study further show that there was a positive relationship between financial incentives and transaction costs with a Pearson's Correlation Coefficient of r = 0.348 and at level of significance of 0.003, was statistically significant as the p-value is less than 0.05. This relationship was relatively weak.

The findings of the study show that there was a positive correlation between fraud risk and turnaround time with a Pearson's Correlation Coefficient of r = 0.338 and at level of significance of 0.000, was statistically significant as the p-value is less than 0.05. This was a relatively weak correlation. The findings showed that the transaction cost was positively correlated to fraud risk with a Pearson's Correlation Coefficient of r = 407 and at level of significance of 0.000, as the p-value is less than 0.05, this was statistically significant. The relationship can be described as not very strong. The results revealed that there is a positive relationship between turnaround time and transaction cost commitment with a Pearson's Correlation Coefficient of r = 0.331. The test was

statistically significant at a level of coefficient of 0.009 as this is less than the p-value of 0.05. This is also a relatively weak relationship.

Table 4.35 Pearson Correlation Matrix for Independent Variables

		Financial incentives	Fraud risk	Turnaround time	Transaction cost
Financial incentives	Pearson Correlation	1	.375**	.497**	.348**
	Sig. (2-tailed)		.000	.000	.003
	N	391	391	391	391
Fraud risk	Pearson Correlation	.375**	1	.338**	.407**
	Sig. (2-tailed)	.000		.000	.000
	N	391	391	391	391
Turnaround time	Pearson Correlation	.497**	.338**	1	.331**
	Sig. (2-tailed)	.000	.000		.009
	N	391	391	391	391
Transaction cost	Pearson Correlation	.348**	.407**	.331**	1
	Sig. (2-tailed)	.003	.000	.009	
	N	391	391	391	391

**. Correlation is significant at the 0.01 level (2-tailed).

4.6.7.2 Analysis of Multinomial Regression Results and Models

The study further carried out regression analysis to determine the relationships betweenfinancial incentives, turnaround time, fraud risk and transaction cost on each of the financial innovation products. This is in accordance with Green and Salkind (2003) who noted that regression analysis is a statistics process of estimating the relationship between variables. The Z value showed the degree of relevance- when the measure can be relied upon, and the coefficient of the effect or relationship. Multinomial logistic

regression is a classification method that generalizes logistic regression to multiclass problems, i.e. with more than two possible discrete outcomes. That is, it is a model that is used to predict the probabilities of the different possible outcomes of a categorically distributeddependent variable, given a set of independent variables which may be real-valued, binary-valued or categorical-valued. (Table 4.36)

When using multinomial logistic regression, one category of the dependent variable is chosen as the reference category. ATM was use as the reference category in this study because of its confirmed acceptance and popularity (Joshua, 2010). Separate odds ratios are determined for all independent variables for each category of the dependent variable with the exception of the reference category, which is omitted from the analysis. The exponential beta coefficient represents the change in the odds of the dependent variable being in a particular category vis-a-vis the reference category, associated with a one unit change of the corresponding independent variable (Vittinghof*et. al.,* 2005).The logit is what is being predicted. The closer a logistic coefficient is to zero, the less influence the predictor has in predicting the logit. Each separate table per channel (FINO) also displays the standard error, *t* statistic, and the p-value. The *t* test for each coefficient is used to determine if the coefficient is significantly different from zero.

The Pseudo R-Square (McFadden R^2) is treated as a measure of effect size, similar to how R^2 is treated in standard multiple regression. However, these types of metrics do not represent the amount of variance in the outcome variable accounted for by the predictor variables. Higher values indicate better fit, but they should be interpreted with caution. The Likelihood Ratio chi-square test is alternative test of goodness-of-fit. As with most chi-square based tests however, it is prone to inflation as sample size increases. Here, model fit is significant $\chi^2 = 776.597$, $p < .001$, which indicates that full model predicts significantly better, or more accurately, than the null model. To be clear, the p-value should be less than the established cutoff (generally 0.05) to indicate good fit. To get the expected B values, the 'exp' function applied to the coefficients is used. The Exp (B) is the odds ratio associated with each predictor. Predictors which increase the logit to display Exp(B) should be greater than 1.0, those predictors which do not have an effect

on the logit will display an Exp (B) of 1.0 and predictors which decrease the logit will have Exp (B) values less than 1.0, considering the figure for the intercepts.(Appendix VII)

4.6.7.3 Combined Multinomial logit regression and Z- values on the adoption of financial innovation products

The result of the combined multinomial regression model to determine the relationship between financial innovation products and financial incentives, turnaround time, fraud risk and transaction cost, is as displayed in Table 4.36 below. The table also included the Z value. Having established the popularity, availability and general preference for ATM from all parameter and indicators by respondents, ATM is made the reference mode for comparison. This is in accordance with Green and Salkind (2003) who noted that regression analysis is a statistics process of estimating the relationship between variables. The Z value showed the degree of relevance and the coefficient of the effect or relationship.

Like other data analysis procedures, initial data analysis should be thorough and include careful univariate, bivariate, and multivariate assessment (Hosmer & Lemeshow, 1989). Specifically, multicollinearity should be evaluated with simple correlations among the independent variables and used to assess for multivariate outliers and for the exclusion of outliers or influential cases. Multinomial logistic regression is often considered an attractive analysis because; it does not assume normality, linearity, or homoscedasticity. However, multinomial logistic regression does have assumptions, such as the assumption of independence among the dependent variable choices (Tabachnick & Fidell, 2001). This assumption states that the choice of or membership in one category is not related to the choice or membership of another category (i.e., the dependent variable). The assumption of independence can be tested with the Hausman-McFadden test. Furthermore, multinomial logistic regression also assumes non-perfect separation. If the groups of the outcome variable are perfectly separated by the predictor(s), then

unrealistic coefficients will be estimated and effect sizes will be greatly exaggerated. All these had been complied with in this study.

Table 4.36 Combined Multinomial logit parameter estimates for financial innovation adoptions (Z- values in parenthesis)

	Point of Sales Terminal	**Internet Banking**	**Electronic Fund Transfer**	**Mobile Banking**
Turnaround time	0.405**	0.017	0.206^{+}	0.153**
	(13.696)	(0.467)	(2.737)	(39.472)
Financial incentives	0.051	0.282**	0.029	0.126 **
	(2.711)	(39.539)	(1.496)	(28.484)
Fraud risk	0.201**	0.012**	0.145 **	0.041 **
	(1.222)	(7.619)	(26.158)	(107.859)
Transaction cost	0.270**	0.266 **	0.388*	0.552**
	(1.310)	(25.371)	(4.185)	(9.506)

Multinomial logit model coefficients were estimated relative to the reference mode ATM

+ Indicates statistical significance at the 10% level

* Indicates statistical significance at the 5% level

** Indicates statistical significance at the 1% level

4.6.7.4 Model Estimates of Point of Sales Terminals relative to ATM

A perusal and analysis of Table 4.37 revealled the following findings:-

Intercept - This is the multinomial logit estimate for POS relative to ATM when the predictor variables in the model are evaluated at zero. Findings from Table 4.37 show that if TT, FI, FR and TC are held constant then the logit for the adoption of POS relative to ATM is 2.289.

The multinomial logit estimate for a one unit increase in TTinadoption of Point of sale Terminal relative to ATM was 0.405. If TT were to increase by one unit, the

multinomial log-odds for POS relative to ATM would be expected to increase by 0.405 unit while holding all other variables in the model constant.Since the Wald test statisticfor the predictor TTis 13.696 with an associated p-value of 0.000 which is less than0.05, level of significance, the null hypothesis was rejected. The regression coefficient for TThas been found to be statistically different from zero for adoption of POS relative to ATM.The relative risk for adoption of POS relative to ATM would be expected to increase by a factor of 1.499 given the other variables in the model are held constant. So, given a one unit increase in TT, the relative risk for adoption of POS relative to ATM would be 1.499 times more likely when the other variables in the model are held constant.

The multinomial logit estimate for a one unit increase in FIin adoption of Point of sale Terminal relative to ATM was 0.051. If FI were to increase by one unit, the multinomial log-odds for POS relative to ATM would be expected to increase by 0.051 units while holding all other variables in the model constant.Since the Wald test statistic for the predictor FIis 2.711 with an associated p-value of 0.100 which is greater than 0.05, the level of significance, the null hypothesis is accepted and concluded that the regression coefficient for FIhas been found not to be statistically different from zero for adoption of POS relative to ATM.The relative risk for adoption of POS relative to ATM would be expected to increase by a factor of 1.052 given the other variables in the model are held constant. So, given a one unit increase in FI, the relative risk for adoption of POS relative to ATM would be 1.052 times more likely when the other variables in the model are held constant.

The multinomial logit estimate for a one unit increase in FRin adoption of Point of sale Terminal relative to ATM was 0.201. If FRwere to increase by one unit, the multinomial log-odds for POS relative to ATM would be expected to increase by 0.201 units while holding all other variables in the model constant.Since the Wald test statistic for the predictor FRis 7.643 with an associated p-value of 0.006 which is less than 0.05, level of significance, the null hypothesis is rejected and it is concluded that the regression coefficient for FRhas been found to be statistically different from zero for adoption of

POS relative to ATM.The relative risk for adoption of POS relative to ATM would be expected to increase by a factor of 1.222 given the other variables in the model are held constant. So, given a one unit increase in FR, the relative risk for adoption of POS relative to ATM would be 1.222 times more likely when the other variables in the model are held constant.

The multinomial logit estimate for a one unit increase in TCin adoption of Point of sale Terminal relative to ATM was 0.270. If TC were to increase by one unit, the multinomial log-odds for POS relative to ATM would be expected to increase by 0.270 unit while holding all other variables in the model constant.Since the Wald test statistic for the predictor TC is 7.948 with an associated p-value of 0.005 which is less than 0.05, level of significance, the null hypothesis is rejected and it is concluded that the regression coefficient for TC has been found to be statistically different from zero for adoption of POS relative to ATM.The relative risk for adoption of POS relative to ATM would be expected to increase by a factor of 1.310 given the other variables in the model are held constant. So, given a one unit increase in TC, the relative risk for adoption of POS relative to ATM would be 1.310 times more likely when the other variables in the model are held constant.

Table 4.37 Parameter Estimates of Point of Sales Terminals relative to ATM

mode[a]		B	Std. Error	Wald	Df	Sig.	Exp(B)
Point of Sales Terminal	Intercept	2.289	.875	6.838	1	.009	
	TT	.405	.109	13.696	1	.000	1.499
	FI	.051	.031	2.711	1	.100	1.052
	FR	.201	.073	7.643	1	.006	1.222
	TC	.270	.096	7.948	1	.005	1.310

a. The reference category is: Automatic Teller Machine

$$\log\frac{\mathbf{pr(POS)}}{\mathbf{pr(ATM)}} = 2.289 + 0.405X_{TT} + 0.051X_{FI} + 0.201X_{FR} + 0.207X_{TC}$$

4.6.7.5Model estimates of Internet Banking relative to ATM

A perusal and analysis of Table 4.38 revealled the following findings:-

Intercept - This is the multinomial logit estimate for IB relative to ATM when the predictor variables in the model are evaluated at zero. Evidences from Table 4.38 show that if TT, FI, FR and TC are held constant then the logit for adoption of Internet banking relative to ATM is 1.006.

The multinomial logit estimate for a one unit increase in TTin adoption of Internet Banking relative to ATM was 0.017. If TT were to increase by one unit, the multinomial log-odds for Internet Banking relative to ATM would be expected to increase by 0.017unit while holding all other variables in the model constant. Since the Wald test statistic for the predictor TTis 0.0467 with an associated p-value of 0.494 which is greater than 0.05level of significance the null hypothesis is accepted and concluded that

the regression coefficient for TThas been found not to be statistically different from zero for adoption of Internet Banking relative to ATM. The relative risk for adoption of Internet Banking relative to ATM would be expected to increase by a factor of 1.017 given that the other variables in the model are held constant. So, given a one unitincrease in TT, the relative risk for adoption of Internet Banking relative to ATM would be 1.017 times more likely when the other variables in the model are held constant.

The multinomial logit estimate for a one unit increase ofFIin adoption of Internet Banking relative to ATM was 0.282. If FI were to increase by one unit, the multinomial log-odds for Internet Bankingrelative to ATM would be expected to increase by 0.282 unit while holding all other variables in the model constant. Since the Wald test statistic for the predictor FI is 39.539 with an associated p-value of 0.000 which is less than 0.05, level of significance, the null hypothesis is rejected and concluded that the regression coefficient for FIhas been found to be statistically different from zero for adoption of Internet Banking relative to ATM. The relative risk for adoption of Internet Banking relative to ATM would be expected to increase by a factor of 1.326 given that the other variables in the model are held constant. So, given a one unit increase in FI, the relative risk for adoption of Internet Banking relative to ATM would be 1.326 times more likely when the other variables in the model are held constant.

The multinomial logit estimate for a one unit increase of FR in adoption of Internet Banking relative to ATM was 0.012. If FR were to increase by one unit, the multinomial log-odds for Internet Banking relative to ATM would be expected to increase by 0.012 units while holding all other variables in the model constant. Since the Wald test statistic for the predictor FR is 7.619 with an associated p-value of 0.006 which is less than 0.05 the level of significance, the null hypothesis is rejectedand therefore conclude that the regression coefficient for FR has been found to be statistically different from zero for the adoption of Internet Banking relative to ATM. The relative risk for the adoption of Internet Banking relative to ATM would be expected to increase by a factor of 1.012 given that the other variables in the model are held constant. So, given a one unit increase in FR, the relative risk for the adoption of Internet Banking relative to ATM

would be 1.012 times more likely when the other variables in the model are held constant.

The multinomial logit estimate for a one unit increase in TC adoption of Internet Banking relative to ATM was 0.266. If TC were to increase by one unit, the multinomial log-odds for Internet Banking relative to ATM would be expected to increase by 0.266 unit while holding all other variables in the model constant. Since the Wald test statistic for the predictor TC is 25.371 with an associated p-value of 0.000 which is lessthan 0.05, the level of significance the null hypothesis is rejected and concluded that the regression coefficient for TC has been found to be statistically different from zero for the adoption of Internet Banking relative to ATM. The relative risk for the adoption of Internet Banking relative to ATM would be expected to increase by a factor of 1.304 given that the other variables in the model are held constant. So, given a one unit increase in TC, the relative risk for the adoption of Internet Banking relative to ATM would be 1.304 times more likely when the other variables in the model are held constant.

Table 4.38 Parameter estimates of Internet Banking relative to ATM

mode[a]		B	Std. Error	Wald	Df	Sig.	Exp(B)
Internet	Intercept	1.006	.636	2.500	1	.114	
Banking	TT	.017	.025	0.467	1	.494	1.017
	FI	.282	.045	39.539	1	.000	1.326
	FR	.012	.004	7.619	1	.006	1.012
	TC	.266	.053	25.371	1	.000	1.304

a. The reference category is: Automatic Teller Machine

$$\log \frac{\mathbf{pr(IB)}}{\mathbf{pr(ATM)}} = 1.006 + 0.017X_{TT} + 0.282X_{FI} + 0.012X_{FR} + 0.266X_{TC}$$

4.4.6.7.6 Model estimates of Electronic Fund Transfer relative to ATM

A perusal and analysis of Table 4.39 revealled the following findings:-

Intercept - This is the multinomial logit estimate for Electronic Fund Transfer relative to ATM when the predictor variables in the model are evaluated at zero. Evidences from Table 4.39 show that if TT, FI, FR and TC are held constant then the logit for adoption of Electronic Fund Transfer relative to ATM is 0.676.

The multinomial logit estimate for a one unit increase in TT in adoption of Electronic Fund Transfer relative to ATM was 0.206 If TT were to increase by one unit, the multinomial log-odds for Electronic Fund Transfer relative to ATM would be expected to increase by 0.206 units while holding all other variables in the model constant. Since the wald test statistic for the predictor TT is 2.737 with an associated p-value of 0.098 which is greater than the 0.05 level of significance, the null hypothesis is accepted and concluded that the regression coefficient for TT has been found not to be statistically different from zero for adoption of Electronic Fund Transfer relative to ATM. The relative risk for the adoption of Electronic Fund Transfer relative to ATM would be expected to increase by a factor of 1.229 given that the other variables in the model are held constant. So, given a one unit increase in TT, the relative risk for the adoption of Electronic Fund Transfer relative to ATM would be 1.229 times more likely when the other variables in the model are held constant.

The multinomial logit estimate for a one unit increase in FI in adoption of Electronic Fund Transfer relative to ATM was 0.029. If FI were to increase by one unit, the multinomial log-odds for Electronic Fund Transfer relative to ATM would be expected to increase by 0.029 units while holding all other variables in the model constant. Since

the wald test statistic for the predictor FI is 1.496 with an associated p-value of 0.221 which is greater than 0.05, the level of significance, the null hypothesis is accepted and conclude that the regression coefficient for FI has been found not to be statistically different from zero for the adoption of Electronic Fund Transfer relative to ATM. The relative risk for the adoption of Electronic Fund Transfer relative to ATM would be expected to increase by a factor of 1.030 given the other variables in the model are held constant. So, given a one unit increase in FI, the relative risk for the adoption of Electronic Fund Transfer relative to ATM would be 1.030 times more likely when the other variables in the model are held constant.

The multinomial logit estimate for a one unit increase in FR in adoption of Electronic Fund Transfer relative to ATM was 0.145. If FR were to increase by one unit, the multinomial log-odds for Electronic Fund Transfer relative to ATM would be expected to increase by 0.145 units while holding all other variables in the model constant. Since the wald test statistic for the predictor FR is 26.158, with an associated p-value of 0.000 that is less than 0.05 the level of significance,the null hypothesis is rejected and conclude that the regression coefficient for FR has been found to be statistically different from zero for the adoption of Electronic Fund Transfer relative to ATM.The relative risk for the adoption of Electronic Fund Transfer relative to ATM would be expected to increase by a factor of 1.156 given the other variables in the model are held constant. So, given a one unit increase in FR, the relative risk for the adoption of Electronic Fund Transfer relative to ATM would be 1.156 times more likely when the other variables in the model are held constant.

The multinomial logit estimate for a one unit increase in TC in adoption of Electronic Fund Transfer relative to ATM was 0.388. If TC were to increase by one unit, the multinomial log-odds for Electronic Fund Transfer relative to ATM would be expected to increase by 0.388 units while holding all other variables in the model constant. Since the wald test statistic for the predictor TC is 4.185 with an associated p-value of 0.041 which is less than 0.05 the level of significance, the null hypothesis is rejected and conclude that the regression coefficient for TC has been found to be statistically

different from zero for the adoption of Electronic Fund Transfer relative to ATM.The relative risk for the adoption of Electronic Fund Transfer relative to ATM would be expected to increase by a factor of 1.475 given the other variables in the model are held constant. So, given a one unit increase in TC, the relative risk for the adoption of Electronic Fund Transfer relative to ATM would be 1.475 times more likely when the other variables in the model are held constant.

Table 4.39 Parameter estimates of Electronic Fund Transfer relative to ATM

	mode[a]	B	Std. Error	Wald	Df	Sig.
Electronic Fund Transfer	Intercept	0.676	0.648	1.09	1	0.296
	Turnaround Time	0.206	0.125	2.737	1	0.098
	Financial Incentives	0.029	0.024	1.496	1	0.221
	Fraud/Security Risk	0.145	0.028	26.158	1	0.000
	Transaction Cost	0.388	0.19	4.185	1	0.041

a. The reference category is: Automatic Teller Machine

$$\log \frac{\mathbf{pr(EFT)}}{\mathbf{pr(ATM)}} = 0.676 + 0.206X_{TT} + 0.029X_{FI} + 0.145X_{FR} + 0.388X_{TC}$$

4.6.7.7 Model estimates of Mobile Banking relative to ATM

A perusal and analysis of Table 4.40 revealled the following findings:-

Intercept - This is the multinomial logit estimate for Mobile Banking relative to ATM when the predictor variables in the model are evaluated at zero. Evidence from Table 4.40 show that if TT, FI, FR and TC are held constant then the logit for the adoption of Mobile Banking relative to ATM is 2.261.

The multinomial logit estimate for a one unit increase in TT in adoption of Mobile Banking relative to ATM was 0.153. If TT were to increase by one unit, the

multinomial log-odds for Mobile Banking relative to ATM would be expected to increase by 0.153 units while holding all other variables in the model constant. Since the wald test statistic for the predictor TTis 39.472 with an associated p-value of 0.000 which is less than 0.05 the level of significance, the null hypothesis is rejected and concluded that the regression coefficient for TT has been found to be statistically different from zero for the adoption of Mobile Banking relative to ATM. The relative risk for the adoption of Mobile Banking relative to ATM would be expected to increase by a factor of 1.165

The multinomial logit estimate for a one unit increase in FI in the adoption of Mobile Bankingrelative to ATM was 0.126. If FI were to increase by one unit, the multinomial log-odd for Mobile Banking relative to ATM would be expected to increase by 0.126 units while holding all other variables in the model constant. Since the Wald test statistic for the predictor FI is 39.472 with an associated p-value of 0.000 which is less than 0.05, level of significance, the null hypothesis is rejected and concluded that the regression coefficient for FI has been found to be statistically different from zero for the adoption of Mobile Banking relative to ATM. The relative risk for the adoption of Mobile Banking relative to ATM would be expected to increase by a factor of 1.134 given the other variables in the model are held constant. So, given a one unit increase in FI, the relative risk for the adoption of Mobile Banking relative to ATM would be 1.134 times more likely when the other variables in the model are held constant.

Multinomial logit estimate for a one unit increase in FR in adoption of Mobile Banking relative to ATM was 0.041. If FR were to increase by one unit, the multinomial log-oddMobile Bankingfor relative to ATM would be expected to increase by 0.041 units while holding all other variables in the model constant. Since the wald test statistic for the predictor FR is 107.859 with an associated p-value of 0.006 which is less than 0.05, level of significance, the null hypothesis is rejected and conclude that the regression coefficient for FR has been found to be statistically different from zero for the adoption of Mobile Banking relative to ATM. The relative risk for the adoption of Mobile Banking relative to ATM would be

expected to increase by a factor of 1.042 given the other variables in the model are held constant. So, given a one unit increase in FR, the relative risk for Adoption of POS relative to ATM would be 1.042 times more likely when the other variables in the model are held constant.

The multinomial logit estimate for a one unit increase in TC in adoption of Mobile Banking relative to ATM was 0.552. If TC were to increase by one unit, the multinomial log-odds for Mobile Banking relative to ATM would be expected to increase by 0.552 units while holding all other variables in the model constant. Since the Wald test statistic for the predictor TC is 9.506 with an associated p-value of 0.002 which is less than 0.05, level of significance, the null hypothesis is rejected and concludes that the regression coefficient for TC has been found to be statistically different from zero for the adoption of Mobile Banking relative to ATM. The relative risk for the adoption of Mobile Banking relative to ATM would be expected to increase by a factor of 1.738 given the other variables in the model are held constant. So, given a one unit increase in TC, the relative risk for the adoption of Mobile Banking relative to ATM would be 1.738 times more likely when the other variables in the model are held constant.

Table 4.40 Parameter estimates of Mobile Banking relative to ATM

ode a		B	Std. Error	Wald	Df	Sig.	Exp(B)
Mobile Banking	Intercept	3.261	.652	25.015	1	.000	
	Turnaround Time	.153	.024	39.472	1	.000	1.165
	Financial Incentives	.126	.024	28.484	1	.000	1.134
	Fraud Risk	.041	.004	107.859	1	.000	1.042
	Transaction Cost	.552	.179	9.506	1	.002	1.738

a. The reference category is: Automatic Teller Machine

$$\log\frac{\mathbf{pr(MB)}}{\mathbf{pr(ATM)}} = 3.261 + 0.153X_{TT} + 0.126X_{FI} + 0.041X_{FR} + 0.552X_{TC}$$

4.7 Findings from the Secondary Data

Having done with all descriptive analysis; demography, factoring, regression and modeling based on collected primary data, the study now turn to secondary data consideration to confirm or dissent on the finding and revelation from the primary data. Secondary data collected from theBanks, Central Bank of Nigeria (CBN), Nigerian Interbank Settlement System (NIBSS) and National Bureau of Statistics Nigeria (NBS) from 2005-2014 were used having confirm them by Time series analysis to compare the result and finding revealed under primary data analysis. These are the acknowledged authentic, reliable sources of valid data on published financial information on financial innovation (Appendix VI).

4.7.1 Financial Incentives

Under financial incentives, the general rate of interest paid on deposits in Deposit Money Banks in Nigeria is between 6% and 12% (Figure 4.7). In the last ten years, it seems that the rate of interest payment is curtailed between these boundaries by the CBN. Banks may not be able to do something serious about this, as this rate is influenced and manipulated by CBN through the Minimum Lending Rate directives. Between 2005 and 2008 spending on products advertisement and promotion was running high as much as N45 Million. But products promotion bills came down to N30 Million in 2009 (probably when it is needed most because of the global financial crisis) and it has remained around this figure even as at 2014.

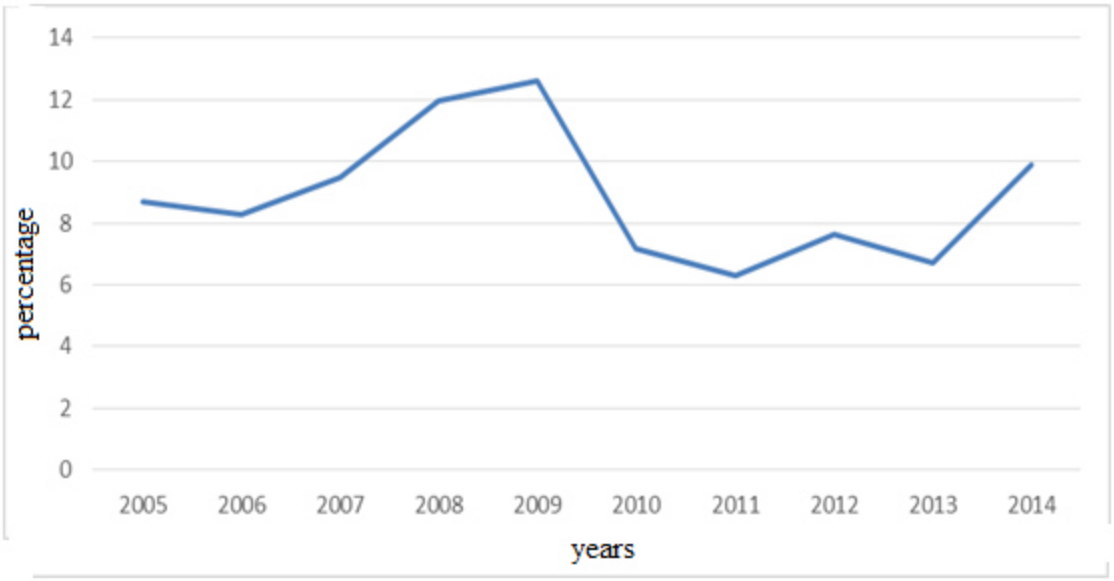

Figure 4.7 Interest Rate movements

The Banks seems to have also slowed down on products promotion and distribution of souvenir (Figure 4.8). There might be need to resuscitate this, spend more on advertisement and promotion. The result confirmed that distribution or giving of financial incentives of one kind or the other to the customers can stimulate their adoption of financial innovation as found out with the primary data. This is in accordance to the submission of Yang and Chin (2012) that a one percent increase in interest rate would induce 12.6% more non-adopter to adopt FINO and a two percent increase in interest rate would make additional 23.3%of improve and encourage the level of patronage, acceptance and adoption of financial innovation.

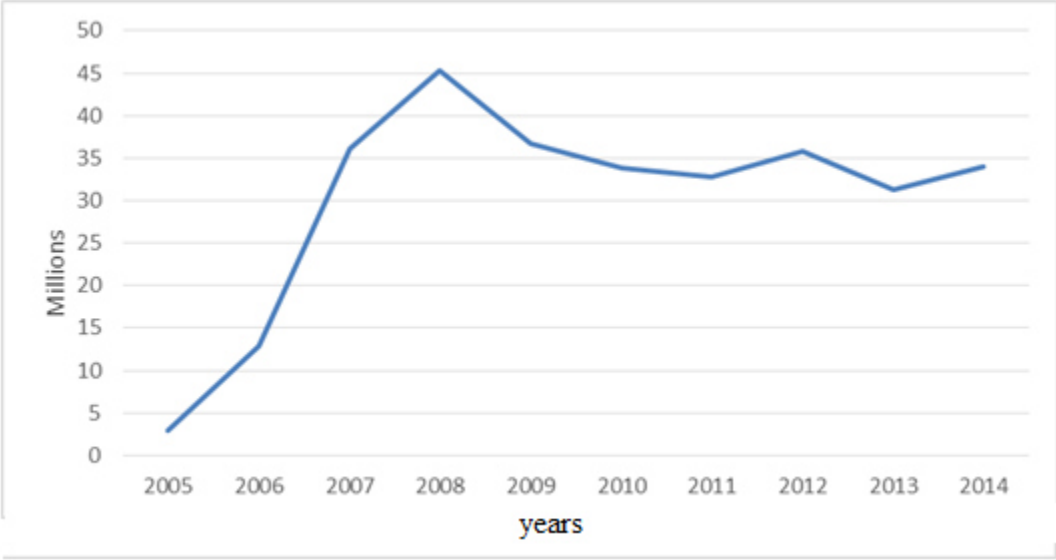

Figure 4.8 Products promotion and products Souvenier expenditure

4.7.2 Fraud Risk

Evidence over the years as shown in Figure 4.9 revealed that the number of risk and fraudulent activities are relatively stable in financial innovation, but it is steadily increasing in the recent time with a sharp increase between 2013 and 2014. On the other hand, the value and amount of loss due to fraud is tumbling down but since 2012 it has started to witness gradual increase again. This is in tandem with the finding on primary data. However, for financial innovation to be widely adopted and made popular fraud and security risk has to be curtailed if not totally removed. Nobody would want to lose his or her money or investment cheaply. One main essence of banking is security now and in the future. One may as well continue to keep his or her money at home or other asset, if the banks and their products are not safe and secured. In a study conducted on internet users by Zhou, Lu and Wang (2010), it was found that Users are concerned about privacy when they are online. In another research conducted by Besavros (2000) it was found that, consumers are always reluctant to share their information online due to fear that their financial life will be open to the internet universe. Gaining the confidence of customers is of paramount important to service providers and if not well managed could discourage users and could encourage negative spread of information which could

pull back intending customer. Customers' security is one of the very important factors in determining the decision of consumer to use financial innovation (Cooper, 1997).

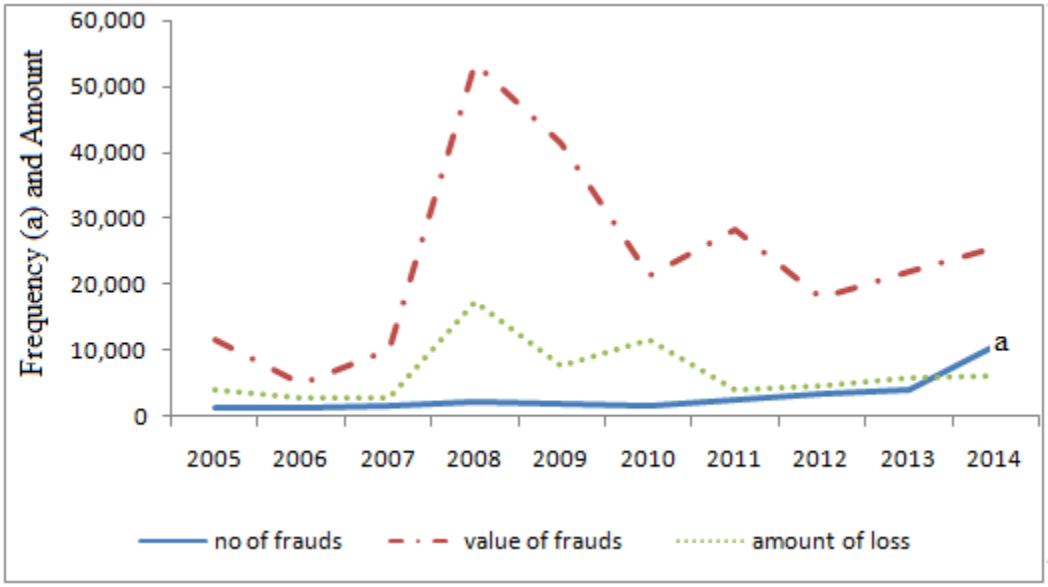

Figure4.9 Numbers, Value and Amount loss on Fraud per Annum

4.7.3 Turnaround Time

In a day labour of 8 hours, average numbers of customers that patronized and serviced by financial innovation products have kept on increasing as revealed in Figure 4.10. The implication of this is that more customers are served per hour in 2006, an average of 31250 customers per hour. The impact of global financial crisis made this plunged down to 6250 customer/hour in 2010. Since then numbers of customers served on financial innovation products have being increasing though it fell again in 2012-2013 to an average of 28,125 customers per hour, probably due to national election tension. However, generally service time per customer has being improving. In 2014 it was 38,750 customers per hour. As more customers are served per hour it means an average customer spent less time to be served. From this analysis, service time is generally improving on financial innovation products and services and it will encourage more people to adopt it.

Figure 4.10 Average Customers serviced by Banks per day

Revealation from Figure 4.10 showed that service time per customer had remained under 5mins for almost ten years. This is good, but the apparent tendency to rise, that it is shown in the recent time (2011 to date) should be curtailed and resisted. True to form and in consonance with the findings on primary data, Customers enjoy self-service, freedom from time and place constraint. Therefore, time and cost savings and freedom from place restriction have been found to be the main reasons underlying banking financial innovation adoption. Real time transaction is very crucial with financial innovation. Auta (2010), identify time factor as one of the prime factor that features in e-banking service quality required by the customers. Savings in time is an importance factor which influences the customers' preference to use e-banking (Beer, 2006).

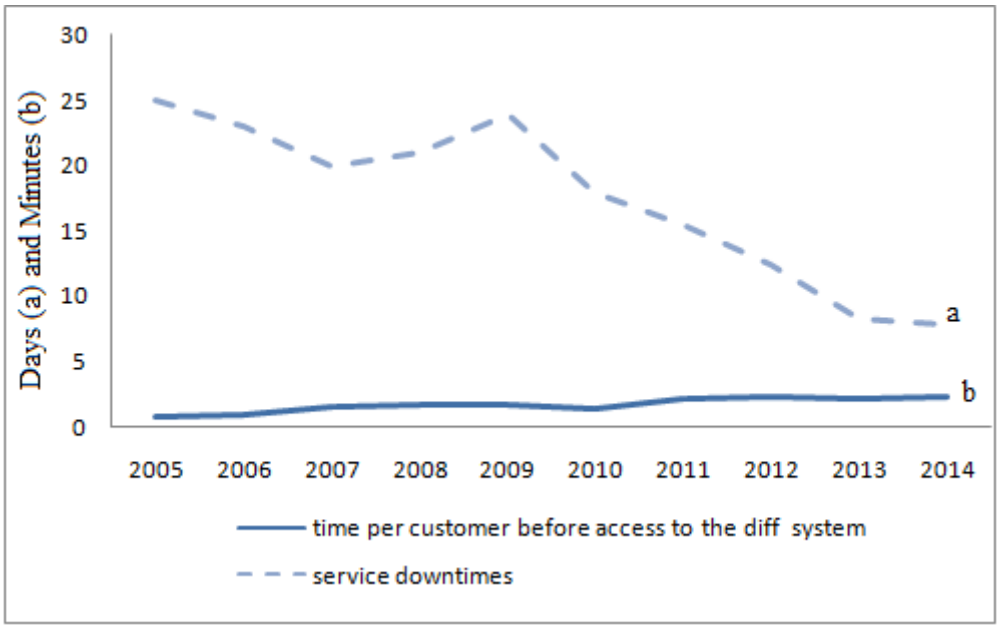

Figure 4.11 Service Downtimes Customers /Queueing time for service

This submission is further corroborated by evidence in Figure 4.11. This went further to show that, service down time of facilities e g Internet and power are improving. These are necessary back bone to the successful adoption of financial innovation. The service down time officially recorded in 2005 was 25 days. This fell to 22 days in 2007. In 2008-2009 it went back to status quo, may be due to global financial crisis again that nearly affected all sectors directly or indirectly in Nigeria. As at now 2014, the average service downtime is steady at 10 days. This may further improve as the state of infrastructural facilities and technology improve. Of course as this improves, it will have a positive rub on effect on the adoption of financial innovation products and services.

4.7.4 Transaction Cost

As shown in Figure 4.12, transaction cost over the years is increasing steadily especially the running cost, while the Annual fees and the Management fees charged have remained stagnant. But in the recent time, from 2012, Management fees seems to start rising moderately. The crux of the matter is rapidly increasing running cost from 2009. If this is passed to the customers definitely they will complain as seen in the respondents' opinion (Table 4.23). The incidence of cost is spread all over and it is

common to all components of financial innovation (Dependent Variables). Banks should look into this as customers are ever cost conscious otherwise, it will have a negative influence on financial innovation adoption. This evidence concur with the finding on primary data where it was found that when a consumer considers a product to be costly, he looks for the nearest alternatives and switches to the next substitute. Financial cost considerations were the major setback with regards to customers' adoption of innovative banking services (Aderonke, 2010). Bong-Keun and Yoon (2013), opines that transaction or financial cost have a signifiIcant impact on behavioral intention towards mobile banking usage and adoption. Little wonder why Premkumar, *et al.* (1994) concluded that cost is the most important variable in the context of innovation.

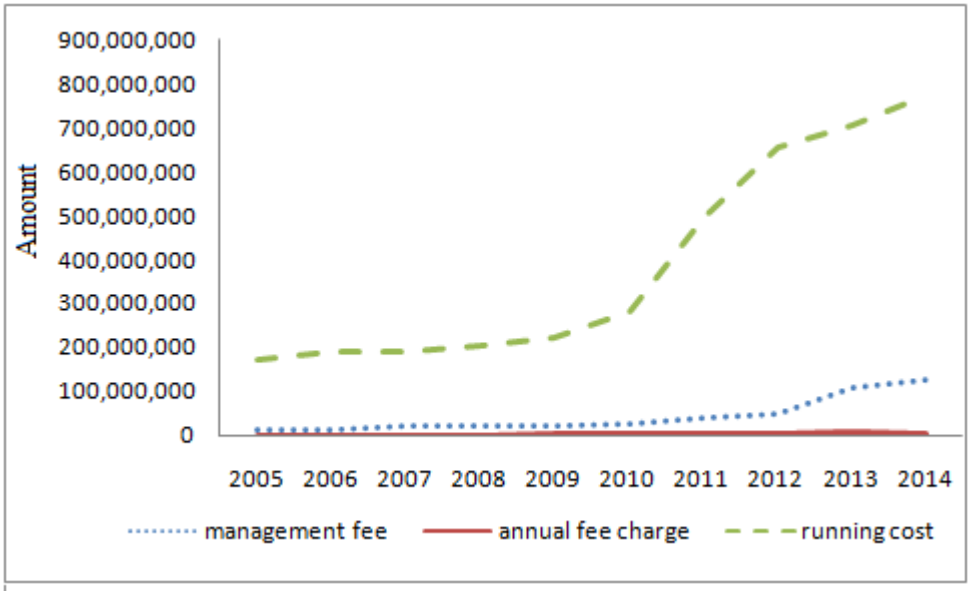

Figure 4.12 Management fees, Annual charges and Running Cost by Banks on Financial Innovation

4.8 Multivariate RegressionAnalysis and results on Secondary data

The study used multivariate regression for secondary data analysis which is about multiple linear relationships,where more than one dependent variable response is measured on each sample unit. Multivariate tests provide a way to understand the

structure of relations across separate response measures (Richardson & Smith,(1993)**;** Asghar& Saleh, (2012)).

The model is stated as: $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$

Where Y – dependent variable –Financial innovation channels

X_1 – Financial Incentives (FI)

X_2 – Turnaround Time (TT)

X_3 – Fraud Risk (FR)

X_4 – Transaction Cost (TC)

ε – is the error term which is assumed to be normally distributed with mean zero and constant variance

β – Parameters to be estimated for each independent variable.

β_0 - is a constant (intercept)

4.8.1 Model Fit / Determinant of ATM innovation adoption

To assess the Model Fit for ATM, Goodness Fit Statistics, such as the adjusted R and R^2 values were examined. These Statistics provided evidence of a good Model Fit. They all have values close to 1, as shown in Table 4.41. The Anova table indicates that the overall model was a good fit since (F-value=2324.554 and p-value=0.000<0.05). These values were acceptable according to Asghar and Saleh (2012). Graphical approach was also employed to test normality. Normal P-P plot was obtained showing that the line representing actual data for the dependent variable closely follows the diagonal representing normally distributed data suggesting a normal istribution as shown in Figure 4.13.

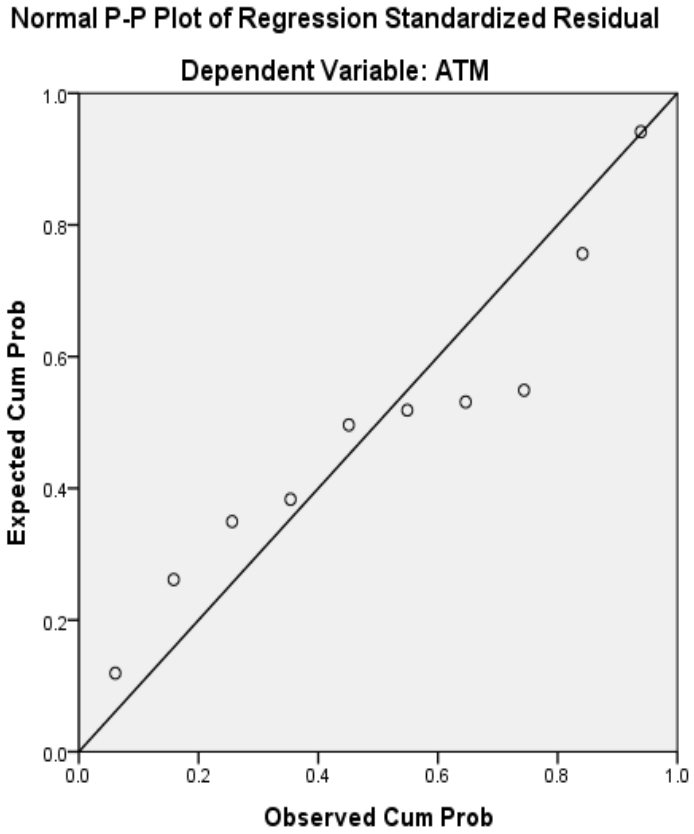

Figure 4.13 Normal P-P Plot of Secondary data Regression on ATM

Evidence from Figure 4.13 show that the variables were not too far away distributed from the diagonal across the P-P plot. Hence in line with the Shapiro test, the distribution passed the normality test and therefore good for analysis.

Table 4.41 Secondary Data Model Fitting Information and Analysis on ATM

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.900[a]	0.81	0.8	0.01733

a. Predictors: (Constant), TC1, FR, FI, TT

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.793	4	0.698	2324.554	.000[b]
	Residual	0.002	5	0		
	Total	2.794	9			

a. Dependent Variable: ATM

b. Predictors: (Constant), TC1, FR, FI, TT

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.672	0.658		5.584	0.003
	FI	-0.023	0.033	-0.015	-0.702	0.005
	TT	1.050	0.052	1.040	20.381	0.000
	FR	0.008	0.031	0.005	0.268	0.010
	TC	-0.076	0.074	-0.037	-1.025	0.035

a. Dependent Variable: ATM

ATM =3.672 - 0.023(FI) +1.050(TT) +0.008(FR)-0.076(TC) + error

FI, Negatively but minimally affected ATM adoption-

ATM($\beta = -0.023, p = 0.005 < 0.05$). This means one unit change in FI results in 0.023 units decrease in ATM adoption.

TT, Positively but moderatelly affected ATM adoption-

ATM($\beta = +1.050, p = 0.000 < 0.05$).This means one unit change in TT results in 1.05 units increase in ATM adoption

FR, Positively but minimally affected ATM adoption-

ATM($\beta = +0.008, p = 0.010 < 0.05$).This means one unit change in FR results in 0.008 units increase in ATM adoption

TC, Negatively but minimally affected ATM adoption-

ATM($\beta = -0.076, p = 0.035 < 0.05$). This means one unit change in TCresults in 0.076unitsreduction in ATM adoption.

4.8.2 Model Fit / Determinant of POS/EFT innovation adoption

To assess the Model Fit for POS/EFT, Goodness Fit Statistics, such as the adjusted R and R^2 values were examined. These Statistics provided evidence of a good Model Fit. They all have values close to 1, as shown in Table 4.42. The Anova table indicates that the overall model was a good fit since (F-value=5.636 and p-value=0.043<0.05). These values were acceptable according to Asghar and Saleh (2012). Graphical approach was also employed to test normality. Normal P-P plot was obtained showing that the line representing actual data for the dependent variable closely follows the diagonal representing normally distributed data suggesting a normal distribution as shown in Figure 4.14.

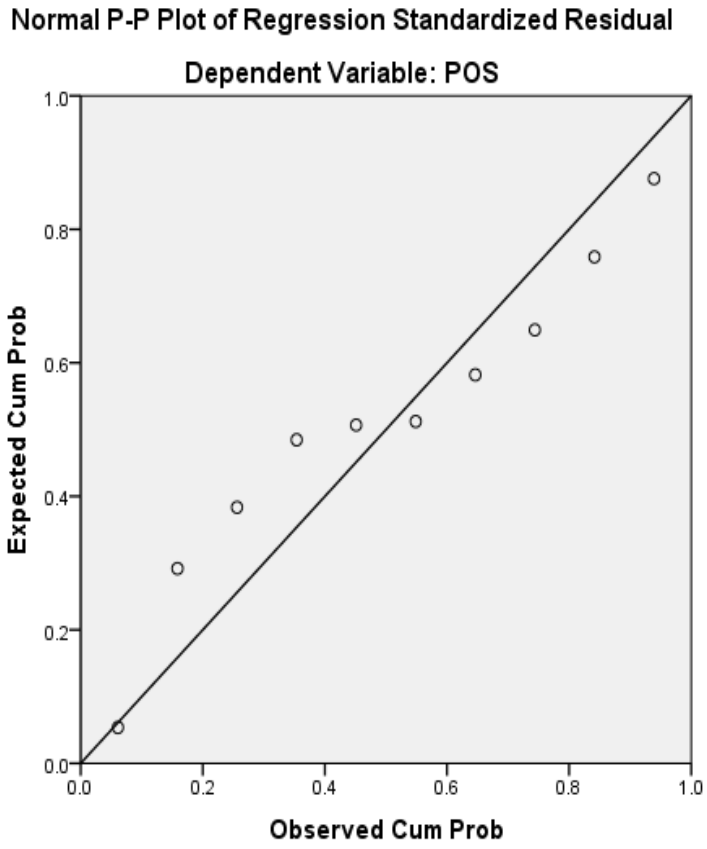

Figure 4.14 Normal P-P Plot of Secondary data Regression on POS/EFT

Evidence from Figure 4.14 show that the variables were not too far away distributed from the diagonal across the P-P plot. Hence in line with the Shapiro test, the distribution passed the normality test and therefore good for analysis.

Table 4.42 Secondary Data Model Fitting Information on POS/ EFT

ANOVA[a]

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.905[a]	0.818	0.673	0.30018

a. Predictors: (Constant), TC1, FR, FI, TT

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2.031	4	0.508	5.636	.043[b]
	Residual	0.451	5	0.09		
	Total	2.482	9			

a. Dependent Variable: POS/EFT
b. Predictors: (Constant), TC1, FR, FI, TT

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	-12.496	11.39		-1.097	0.323
	FI	-0.105	0.575	-0.071	-0.183	0.009
	TT	-0.08	0.893	-0.085	-0.09	0.009
	FR	0.209	0.537	0.122	0.39	0.007
	TC	1.872	1.278	0.967	1.465	0.02

a. Dependent Variable: POS/EFT

POS/EFT = -12.496 - 0.105(FI) -0.080(TT) +0.209(FR)+1.872(TC) + error

ively but mildly affected POS/EFT adoption-

POS/EFT ($\beta = -0.105, p = 0.009 < 0.05$). This means one unit change in FI results in

0.105 units decrease in POS/EFT adoption.

TT, Negatively but minimally affected POS/EFT adoption-

POS/EFT ($\beta = -0.080, p = 0.009 < 0.05$). This means one unit change in TT results in 0.080 units reduction in ATM adoption

FR, Positively but minimally affected POS/EFTadoption-

POS/EFT ($\beta = +0.209, p = 0.007 < 0.05$). This means one unit change in FR results in 0.209 units increase in POS/EFT adoption

TC, Negatively but minimally affected POS/EFT adoption-

POS/EFT ($\beta = +1.872, p = 0.020 < 0.05$). This means one unit change in TC results in 1.872 units increase in POS/EFT adoption.

4.8.3 Model Fit / Determinant of IB innovation adoption

To assess the Model Fit for IB, Goodness Fit Statistics, such as the adjusted R and R^2 values were examined. These Statistics provided evidence of a good Model Fit. They all have values close to 1, as shown in Table 4.43. The Anova table indicates that the overall model was a good fit since (F-value=15.439 and p-value=0.005<0.05). These values were acceptable according to Asghar and Saleh (2012). Graphical approach was also employed to test normality. Normal P-P plot was obtained showing that the line representing actual data for the dependent variable closely follows the diagonal representing normally distributed data suggesting a normal distribution as shown in Figure 4.15.

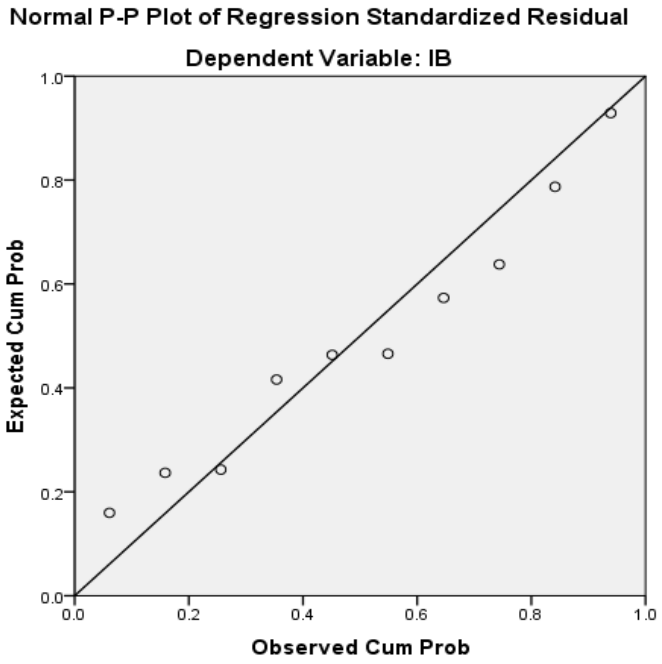

Figure 4.15 Normal P-P Plot of Secondary data Regression on IB

Evidence from Figure 4.15 show that the variables were not too far away distributed from the diagonal across the P-P plot. Hence in line with the Shapiro test, the distribution passed the normality test and therefore good for analysis.

Table 4.43 Secondary Data Model Fitting Information and Analysis on IB

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.962[a]	0.925	0.865	0.14426

a. Predictors: (Constant), TC1, FR, FI, TT

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.285	4	0.321	15.439	.005[b]
	Residual	0.104	5	0.021		
	Total	1.389	9			

a. Dependent Variable: IB

b. Predictors: (Constant), TC1, FR, FI, TT

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	-8.929	5.474		-1.631	0.164
	FI	0.892	0.276	0.810	3.228	0.023
	TT	-0.145	0.429	-0.204	-0.338	0.007
	FR	0.134	0.258	0.104	0.518	0.063
	TC	0.667	0.614	0.461	1.086	0.003

a. Dependent Variable: IB

POS/EFT = -8.929 +0.892(FI) -0.145(TT) +0.134(FR)+0.667(TC) + error

FI, Positively and significantly affected IB adoption-

IB ($\beta = +0.892, p = 0.023 < 0.05$). This means one unit change in FI results in 0.892 units increase in IB adoption.

TT, Negatively affected IB adoption-

IB ($\beta = -0.145, p = 0.007 < 0.05$). This means one unit change in TT results in 0.080 units reduction in IB adoption

FR, is not considered. (the p value = 0.63> 0.05).

TC, Positively and significantly affected IB adoption-

IB ($\beta = +0.667,\ p = 0.003 < 0.05$). This means one unit change in TC results in 0.667 units increase in IB adoption.

4.8.4 Model Fit / Determinant of MB innovation adoption

To assess the Model Fit for MB, Goodness Fit Statistics, such as the adjusted R and R^2 values were examined. These Statistics provided evidence of a good Model Fit. They all have values close to 1, as shown in Table 4.44. The Anova table indicates that the overall model was a good fit since (F-value=7.383 and p-value=0.025<0.05). These values were acceptable according to Asghar and Saleh (2012). Graphical approach was also employed to test normality. Normal P-P plot was obtained showing that the line representing actual data for the dependent variable closely follows the diagonal representing normally distributed data suggesting a normal distribution as shown in Figure 4.16.

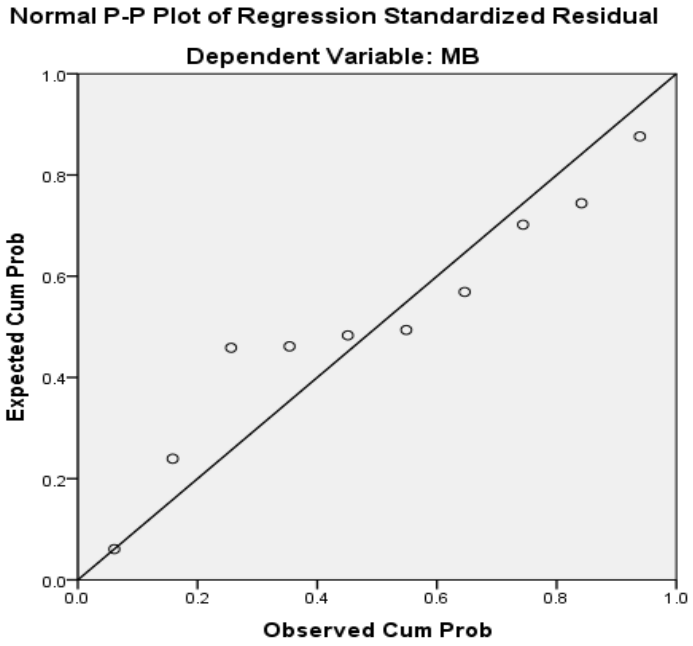

Figure 4.16 Normal P-P Plot of Secondary data Regression on MB

Evidence from Figure 4.16 show that the variables were not too far away distributed from the diagonal across the P-P plot. Hence in line with the Shapiro test, the distribution passed the normality test and therefore good for analysis.

Table 4.44 Secondary Data Model Fitting Information and Analysis on MB

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.925[a]	0.855	0.739	0.39646

a. Predictors: (Constant), TC1, FR, FI, TT

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.642	4	1.16	7.383	.025[b]
	Residual	0.786	5	0.157		
	Total	5.428	9			

a. Dependent Variable: MB

b. Predictors: (Constant), TC1, FR, FI, TT

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	-19.277	15.044		-1.281	0.256
	FI	1.469	0.76	0.675	1.934	0.011
	TT	-0.073	1.179	-0.052	-0.062	0.010
	FR	-0.357	0.709	-0.141	-0.504	0.006
	TC	1.59	1.687	0.555	0.942	0.039

a. Dependent Variable: MB

MB = -19.227 +1.469(FI) -0.073(TT) -0.357(FR)+1.590(TC) + error

FI, Positively and significantly affected MB adoption-

MB$\beta = +1.469, p = 0.011 < 0.05$). This means one unit change in FI results in 1.469 units increase in MB adoption.

TT, Negatively but minimally affected MB adoption-

MB($\beta = -0.073, p = 0.010 < 0.05$). This means one unit change in TT results in 0.073units reduction in MB adoption

FR, Negatively affected MB adoption-

MB($\beta = -0.357, p = 0.006 < 0.05$). This means one unit change in FR results in 0.357 units increase in MB adoption

TC, Positively and significantly affected MB adoption-

MB($\beta = +1.590, p = 0.039 < 0.05$). This means one unit change in TC results in 1.590 units increase in MB adoption.

4.9 General Discussion of Secondary data results onFinancial Innovation Channels

Analysis of the secondary data showed that Fraud risk affects financial innovation adoption on all the products. The summary of the findings from the analysis of the secondary datawere as follows, amongst independent variables:

Based on Financial incentives -Only IB and MB are significantly affected.

But ATM and POS/EFT are mildly affected

Based on Fraud risk- All products except IB are affected. Though mildly for ATM and POS/EFT, but significantly for MB.

Based on Turnaround time -All products/ channels are affected but more pronounced with IB.

Based on Transaction Cost - All products are influenced by TC, but it is more pronounced and significant with IB and MB.

Fraud risk seems to have proved the most dangerous to financial innovation adoption as opined by Soludo, (2008). Summaries of other findings are as stated below, amongst dependent variables (Financial innovation Channels/Instruments):

Automatic Teller Machine (ATM) -Fraud risk is the lead determinant of adoption.

Electronic Fund Transfer and Pointof Sale terminals (POS/EFT)-Fraud risk is thelead determinant of adoption.

Mobile Banking (MB) -Fraud risk and Transaction cost are the lead determinants of adoption.

Internet Banking (IB) -Transaction cost and Financial incentives are the lead determinants of adoption.

Evidence from facts and figures including graphical illustrations confirmed that volume and value of transactions in FINO is growing up yearly. This mean acceptance and adoption of financial innovation is picking up, but the rate of adoption of ATM is moving faster, than others. While others: POS, MB, EFT and IB are still crawling, ATM acceptance and adoption is flying. The banks have to do something about this (Figures 4.17 and 4.18). For ATM, there had been little ups and downs in volume and related value of transactions between 2005 and 2010 but since 2010, the volume and value of transaction was just flying, showing the level of popularity, acceptance and adoption as confirmed by all parameters of investigation under primary data.

Also despite huge investment and other expenditures by Banks on innovative banking, volume and value of transactions under POS and EFT (merged together in Figures 4.17 and 4.18) are not encouraging (low adoption rate). As for MB and IB since 2005, they are just crawling, though there is a little improvement since 2012. This may be attributable to CBN and Federal Government policy on Cashless Transaction Policy since 2012. However, among these four other products, POS is faring better as shown in the graphs. These positions merely confirmed the findings under primary data analysis where ATM is the most widely adopted and patronized financial innovation. The lead

determining factor based on respondents' measure of preference is fraud/ security risk. Financial incentive takes the lead for respondents' reason of preference with POS. However, Transaction cost leads the table on reason of preference among these three products EFT, MB and IB, whereas Turnaround time was not preferred as a lead determinant for any of the financial innovation products.

Financial innovation adoption is based upon meeting the needs of the customer, a view supported and conveyed in Mols *et al*., (1999).There is market, there are opportunities even government backing and support are guaranteed. Nyangosi and Arora (2011) argued that financial institutions only embrace different electronic channels just to meet the demand of the customers. Woldie *et al.,* (2008) rightly observed: "It is one thing to innovate, but entirely another thing for the innovation to be accepted by consumers.'' The banks have to do more to encourage and stimulate the customers on financial innovation adoption.

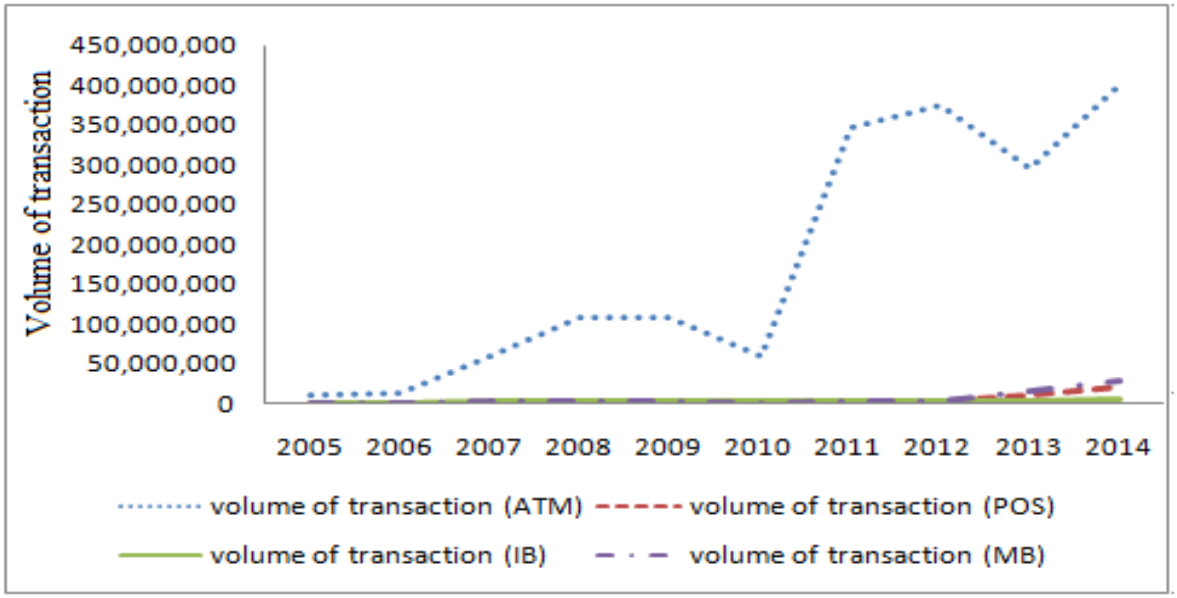

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Figure 4.17 Volume of transactions on Financial Innovation Products

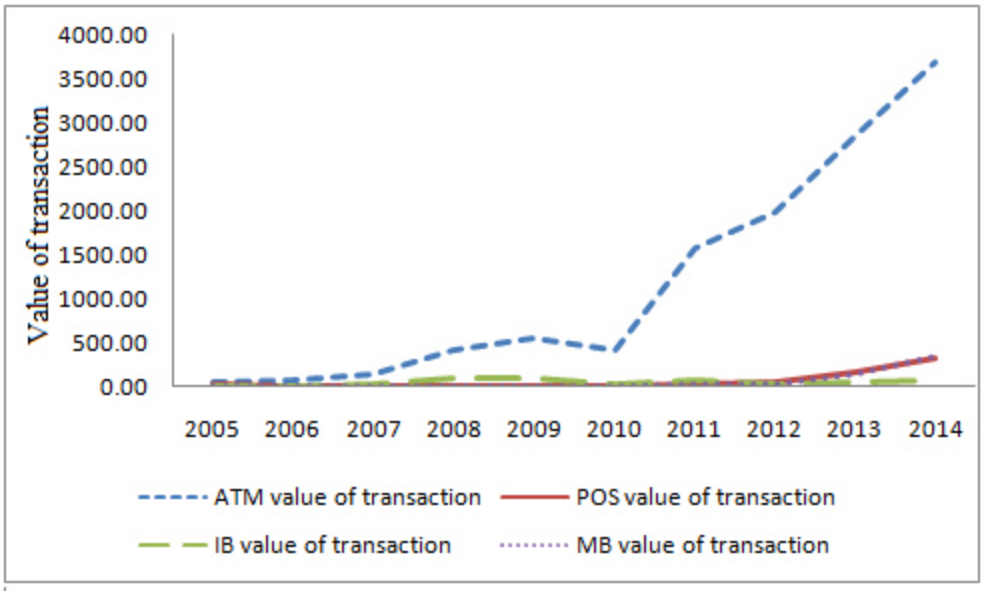

Figure 4.18 Value of transaction on Financial Innovation Products

4.10 Communicative Predictive Validity

Given two sets of data and inferential statistics analysis, for validity of outcomes, it is good to triangulate the procedure as suggested by Creswell, (2014). Then compare the alternative methods and their outcomes. Rather than thinking of qualitative and quantitative strategies as incompatible, they should be seen as complementary as opined by Malterud, (2001).Thereforeit is scientific to carry out communicative predictive validity in accordance with Zahner *et al.,* (2014).

Findings according to evidence from the study showed that ATM is the most widely adopted and patronized financial innovation, under secondary data as it was found under primary data, a view supported by Joshua (2010), in Ghana. The lead determining factor based on Multivariate regression is Fraud/ Security Risk. This was also found to be so under primary data and it was also supported by evidence from Ezeoha (2005), and Kondabagil (2007). Financial incentive and Transaction cost take the lead as determinants for Internet Bankingand Mobile Banking both under secondary dataand primary data. Instead of Financial Incentives that pose as lead determinant of POS adoption revealed by primary data, it was Fraud/Security Risk under secondary data.

Turnaround time was not preferred as a lead determinant for any of the financial innovation productsadoption under secondary and primary data, whereas it was a major factor for ATM under primary data. This is not to say that turnaround time is not relevant or important, but that other determinants are more recognized.

4.11 Hypotheses Tests

The study used multinomial and Multivariate regression analysis to determine the statistical relationship between the independent and dependent variables. All the four null hypotheses as stated in chapter one of this study were tested using multinomial regression models, where the order in which the variables were entered is based on a statistical decision not a theory.These methods are used when one dependent variable is used as criteria for placement or choice on subsequent dependent variables (Schwab, 2002). In this case ATM because of its popularity and already wider acceptance/adoption.B**y** and large, the outcome of the test of hypotheses is mixed.

Hypothesis 1: Financial Incentives has no effect onFinancial Innovation adoption

Financial incentive has significant effect on the adoption of IB and MB at5%, but it has no effect on POS and EFT.The multinomial logit estimate for a one unit increase in FI in adoption of Point of sale Terminal relative to ATM was 0.051. If FI were to increase by one unit, the multinomial log-odds for POS relative to ATM would be expected to increase by 0.051 unit while holding all other variables in the model constant. The multinomial logit estimate for a one unit increase in FI in adoption of Internet Banking relative to ATM was 0.282. If FI were to increase by one unit, the multinomial log-odds for Internet Banking relative to ATM would increase by 0.282 units while holding all other variables in the model constant. The multinomial logit estimate for a one unit increase in FI in adoption of Electronic Fund Transfer relative to ATM was 0.029. If FI were to increase by one unit, the multinomial log-odds for Electronic Fund Transfer relative to ATM would be expected to increase by 0.029 units while holding all other variables in the model constant. The multinomial logit estimate for a one unit increase in FI in the adoption of Mobile Banking relative to ATM was 0.126. If FI were to increase

by one unit, the multinomial log-odd for Mobile Banking relative to ATM would be expected to increase by 0.126 units while holding all other variables in the model constant.

Since the Wald test statistic for the predictor FI is 2.711 with an associated p-value of 0.100 which was greater than 0.05 level of significance, the null hypothesis was accepted and concluded that the regression coefficient for FIhas been found not to be statistically different from zero for adoption of POS relative to ATM.

Since the Wald test statistic for the predictor FIis 39.539 with an associated p-value of 0.000 which was less than 0.05, level of significance, the null hypothesis was rejected and concluded that the regression coefficient for FIhas been found to be statistically different from zero for adoption of Internet Banking relative to ATM.

Since the wald test statistic for the predictor FIis 1.496 with an associated p-value of 0.221 which is greater than 0.05 level of significance, the null hypothesis was accepted and concluded that the regression coefficient for FIhas been found not to be statistically different from zero for the adoption of Electronic Fund Transfer relative to ATM.

Since the Wald test statistic for the predictor FIis 39.472 with an associated p-value of 0.000 which is less than 0.05, level of significance, the null hypothesis was rejected and concluded that the regression coefficient for FIhas been found to be statistically different from zero for the adoption of Mobile Bankingrelative to ATM.

Hypothesis 2: Fraud Risk has no significant effect on Financial Innovation adoption

The result disputed the null hypothesis and concluded that fraud risk is relevant and affects the adoption of all products of financial innovation at 5 %. The multinomial logit estimate for a one unit increase in FR in adoption of Point of sale Terminal relative to ATM was 0.201. If FR were to increase by one unit, the multinomial log-odds for POS relative to ATM would be expected to increase by 0.201 units while holding all other variables in the model constant. The multinomial logit estimate for a one unit increase in FR in adoption of Internet Banking relative to ATM was 0.012. If FR were to increase by one unit, the multinomial log-odds for Internet Banking relative to ATM would be expected to increase by 0.012 unit while holding all other variables in the model constant. The multinomial logit estimate for a one unit increase in FR in adoption of Electronic Fund Transfer relative to ATM was 0.145. If FR were to increase by one unit, the multinomial log-odds for Electronic Fund Transfer relative to ATM would be expected to increase by 0.145 units while holding all other variables in the model constant. The multinomial logit estimate for a one unit increase in FR in adoption of Mobile Banking relative to ATM was 0.041. If FR were to increase by one unit, the multinomial log-oddMobile Bankingfor relative to ATM would be expected to increase by 0.041 units while holding all other variables in the model constant.

Since the Wald test statistic for the predictor FR is 7.643 with an associated p-value of 0.006 which is less than 0.05 level of significance,thenull hypothesis was rejected and concluded that the regression coefficient for FR has been found to be statistically different from zero for adoption of POS relative to ATM.

Since the Wald test statistic for the predictor FR is 7.619 with an associated p-value of 0.006 which is less than 0.05 level of significance,the null hypothesis was rejected and concluded that the regression coefficient for FR has been found to be statistically different from zero for the adoption of Internet Banking relative to ATM.

Since the Wald test statistic for the predictor FR is 26.158, with an associated p-value of 0.000 that is less than 0.05, level of significance, the null hypothesis was rejected and concluded that the regression coefficient for FR has been found to be statistically different from zero for the adoption of Electronic Fund Transfer relative to ATM.

Since the Wald test statistic for the predictor FR is 107.859 with an associated p-value of 0.006 which is less than 0.05, level of significance, the null hypothesis was rejected and concluded that the regression coefficient for FR has been found to be statistically different from zero for the adoption of Mobile Banking relative to ATM.

Hypothesis 3: Turnaround Time has no significant influence on Financial Innovation adoption

The result of the multinomial regression confirmed that for ATM, POS andMB, turnaround time was significant but only significant for EFT at 10%. For IB, turnaround time is not significant. The multinomial logit estimate for a one unit increase in TT in adoption of Point of sale Terminal relative to ATM was 0.405. If TT were to increase by one unit, the multinomial log-odds for POS relative to ATM would be expected to increase by 0.405 units while holding all other variables in the model constant. The multinomial logit estimate for a one unit increase in TT in adoption of Internet Banking relative to ATM was 0.017. If TT were to increase by one unit, the multinomial log-odds for Internet Banking relative to ATM would be expected to increase by 0.017 unit while holding all other variables in the model constant. The multinomial logit estimate for a one unit increase in TT in adoption of Electronic Fund Transfer relative to ATM was 0.206. IfTT were to increase by one unit, the multinomial log-odds for Electronic Fund Transfer relative to ATM would be expected to increase by 0.206 units while holding all other variables in the model constant. The multinomial logit estimate for a one unit increase in TT in adoption of Mobile Banking relative to ATM was 0.153. If TT were to increase by one unit, the multinomial log-odds for Mobile Banking relative to ATM would be expected to increase by 0.153 unit while holding all other variables in the model constant.

Since the Wald test statistic for the predictor TT is 13.696 with an associated p-value of 0.000 which is less than 0.05, level of significance, the null hypothesis was rejected and concluded that the regression coefficient for TT has been found to be statistically different from zero for Adoption of POS relative to ATM.

Since the Wald test statistic for the predictor TT is 0.0467 with an associated p-value of 0.494 which is greater than 0.05level of significance,thenull hypothesis was accepted and concluded that the regression coefficient for TT has been found not to be statistically different from zero for adoption of Internet Banking relative to ATM.

Since the Wald test statistic for the predictor TT is 2.737 with an associated p-value of 0.098 which is greater than the 0.05 level of significance, the null hypothesis was accepted and concluded that the regression coefficient for TT has been found not to be statistically different from zero for adoption of Electronic Fund Transfer relative to ATM.

Since the Wald test statistic for the predictor TT is 39.472 with an associated p-value of 0.000 which is less than 0.05, level of significance, the null hypothesis was rejected and concluded that the regression coefficient for TT has been found to be statistically different from zero for the adoption of Mobile Banking relative to ATM.

Hypothesis 4: Transaction Cost has no effect on Financial Innovation adoption

The result of the multinomial regression concluded that for ATM, POS, IB and MB transaction cost is generally significant to all products of financial innovation at 5%, but for EFT even at 1%.The multinomial logit estimate for a one unit increase in TC in adoption of Point of sale Terminal relative to ATM was 0.270. If TC were to increase by one unit, the multinomial log-odds for POS relative to ATM would be expected to increase by 0.270 units while holding all other variables in the model constant. For Internet Banking relative to ATM was 0.266. If TC were to increase by one unit, the multinomial log-odds for Internet Banking relative to ATM would be expected to increase by 0.266 units while holding all other variables in the model constant. The

multinomial logit estimate for a one unit increase in TC in adoption of Mobile Banking relative to ATM was 0.552. If TC were to increase by one unit, the multinomial log-odds for Mobile Banking relative to ATM would be expected to increase by 0.552 units while holding all other variables in the model constant. The multinomial logit estimate for a one unit increase in TC in adoption of Electronic Fund Transfer relative to ATM was 0.388. If TC were to increase by one unit, the multinomial log-odds for Electronic Fund Transfer relative to ATM would be expected to increase by 0.388 units while holding all other variables in the model constant.

Since the Wald test statistic for the predictor TC is 7.948 with an associated p-value of 0.005 which is less than 0.05 level of significance,thenull hypothesis was rejected and concluded that the regression coefficient for TC has been found to be statistically different from zero for adoption of POS relative to ATM.

Since the Wald test statistic for the predictor TC is 25.371 with an associated p-value of 0.000 which is less than 0.05 level of significance,the null hypothesis was rejected and concluded that the regression coefficient for TC has been found to be statistically different from zero for the adoption of Internet Banking relative to ATM.

Since the Wald test statistic for the predictor TC is 9.506 with an associated p-value of 0.002 which is less than 0.05, level of significance, the null hypothesis was rejected and concluded that the regression coefficient for TC has been found to be statistically different from zero for the adoption of Mobile Banking relative to ATM.

Since the Wald test statistic for the predictor TC is 4.185 with an associated p-value of 0.041 which is less than 0.05, level of significance,The null hypothesis was rejectedand conclude that the regression coefficient for TC has been found to be statistically different from zero for the adoption of Electronic Fund Transfer relative to ATM.

4.12 Chapter Summary

This chapter has presented descriptive data analysis using frequency tables, percentages, mean, Standard deviation, charts, graphs, diagrams, multinomial and multivariate regressions. Statistical tests were also analyzed in the chapter including KMO tests and Z scores. The profiles of banks' customers were presented at the beginning of the chapter followed by responses from each variable section of the questionnaire. The descriptive and factor analysis of primary data showed that a high validity and reliability was achieved by questionnaire instrument with a reliability coefficients ranging from 0.6 to 0.9 as shown previously. These figures fall within the acceptable levels of data reliability and consistency according to statistics scholars including (Serakan&Boogie, 2011). Multinomial logistic regression and Multivariate regression were used to test the hypotheses, Both tests of significance using t- tests and Z- tests have indicated varying level of significance amongst the independent variables as well as when combined, against the dependent variable.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

In this chapter, the summary of findings, conclusions and recommendations of the study were presented. The purpose of the study was to investigate the determinants of financial innovation adoption in Nigeria Deposit money banks. The objectives of the study were to determine how financial incentives affects financial innovation products and services adoption; explore the extent to which fraud affects financial innovation products and services adoption; appraise how transaction cost affectsfinancial innovation products and services adoption and finally to determine how turnaround time affect the adoption of financial innovation products andservices in Deposit Money Banks in Nigeria.The presentation was organized around specific objectives and research hypotheses. The conclusions were in accordance with the specific objectives and research hypotheses with suggestions for further study. Each recommendation relates to each conclusion.

5.2 Summary of Findings

Findings from the study showed that Nigeria's slow adoption of financial innovation in banking practice is rapidly changing for the better. Awareness for financial innovation in Nigeria is increasing and it accounted forN10 trillion worth of transaction in 2014 (NIBSS, 2015). ATM is the mostly widely adopted financial innovation and mostly common. This is followed by EFT and POS in that order. Other channels like MB and IB are just getting off their starters' block. With intensification of public enlightenment, promotion and advertisement, development and good maintenance of infrastructure, rate of adoption will improved rapidly. More so in view of the current government recently introduced cashless policy, findings have shown that with improved technological development and provision of basic infrastructure there will be improved adoption of financial innovation with overall reduction in the amount of cash based transactions.

Theadvancement in technologies has led to banks improvedefficiency and effectiveness through reducing the transaction cost and increasing the speed of service. The consumers thinkthat financial innovationallows consumers easier access to financial services, time saving and thrift in managing their finances. Due to the advantages derived by both banks and customers in the financial market, financial innovation products and services and its adoption has already started to grow in Nigeria.

As the banking industry becomes global in nature, faces a competitive environment; banks are forced to innovate. The study showed that variety offinancial innovation services are important drivers in the banking industry for Bank's performance and customer quality service delivery. It has significant effect in supporting economic development through efficientfinancial system. It was found that security and fraud risk from the customers' perspective is an important determinantonfinancial innovation adoption, while, time, cost and incentiveswere considered to be influential factors for Financial innovation usage and adoption. There is a positive relationship betweenavailability, awareness and adoption offinancial innovation products and the ability of banks to meet users' needs using the different features of financial innovation products.

5.2.1 Financial Incentives

Findings on the first objective revealed that Bank Customers are sensitive to incentives in Nigeria. Financial incentives have been moderately helpful in the cause of financial innovation adoption. However, thecampaign did not seem to get to those who need it or deserve it most. This is because apart from interest rate application which is done automatically and display of product banners and public enlightenment campaigns which everybody can see, distribution of banks' products souvenir and other gift items is often selective or matter of personal connection or relationship with the bank officials. This means financial incentives are not justifiably used and it often get to wrong hands. It was therefore not surprising that most respondents do not believe in it as a stable and reliable determinant of financial innovation adoption.However, based on financial incentives, most respondents prefer ATM, followed by POS because of credit

enticement given to business merchants, Mobile banking because of its attractive top up features, EFT being mainly used by corporate organizations and individuals for bulk andinternational settlements. The popularity of Internet banking based on financial incentives is the least. This means EFT, MB and IB can be worked on for improvement, but the general attitude of bank officials on corporate gifts has to change.

5.2.2 Fraud and Security Risk.

Fraud/ Security risk is another very important variable in determining the decision of customers to use and adopt financial innovation. It is the second objective of study. Customers are often skeptical on security issues and are afraid of fraud risks. Finding from the respondents on security and fraud risks showed that despite its poor reputation on the subject matter, ATMis still the most preffered by customers, compared to other innovation products, despite the fact that it appears to be the most fraudulent and security risk ladened. However, as security on FINO generally improves, fraudulent practices will be tightened up. One would have thought that the level of security risks often associated with ATM would have deterred its preference, the result proved contrary to expectation.The order of preferenceafter ATM is IB, EFT, POS and MB respectively. This trend might change as respondents become more familiar with other financial innovation products and the products become more popular and affordable.

5.2.3 Transaction Costs

Transaction cost is the third objective and independent variable. It is one of the major determinants of customers' financial innovation adoption. From findings, there is relatively fair distribution of opinion as far as transaction cost is concerned. It is either that the products are generally costly or cost of transaction is generally relatively high. There is also the possibility of products' awareness and availability underpinning this opinion. Generally doing business in Nigeria until recently is costly. Individual organization has to provide its own basic amenities for survival. Such things as electricity and telecommunication services, developmental infrastructure taken for granted in developed economies.It is these operational running costs that swell up bank

charges and customers' transaction cost as the costs has to be spread on financial innovation products and services which has to be provided round the clock.It is only Internet banking that has lowest respondents' preference. All other products fairly rank equally on cost basis. This can be attributed to level of awareness and popularity of the products. Opinion about transaction cost and preference seems fairly same for all products. Given the relatively high incidence of poverty which is around 54% (CBN, 2009), Nigerian consumers tend to be highly price sensitive and tocharges by Deposit money banks in Nigeria. However, to some sophisticated customers, satisfaction is the basis of evaluation of a product or service in terms of whether that product or service has met their needs and expectations therefore, they worry less about charges.

5.2.4 Turnaround Time

The fourth objective investigated the significance of turnaround time on financial innovation adoption. It is also the last independent variable in the study. Evidence from the study showed that majorityof the respondents opined that modern banking is faster than traditional banking. Amazingly on relevance of timing banking service, most of the respondentsalso said it is fruitlessand needless. However this majority could have seen banking as part of daily life, so innovation and time consciousness as integral part of banking. Findings on the study further showed that as far as turnaround time is concerned ATM is the most preferred, followed by POS and MB. This preference may have to do with what the customers are used to. As the products get more popular and recognized, there might be improvement. The import of this is that the banks have more works to do on public enlightenment, product awareness and time management. Customers enjoy self-service, freedom from time and place constraint, and reduced stress of queuing in banking hall. Therefore, time, cost savings and freedom from place confinement have been found to be major factors underlying banking financial innovation adoption.

5.3 Conclusion

Financial innovation adoption is gradually gaining ground in Nigeria. Full fledge banking innovation products and services such as ATM, POS, EFT, Internet banking and Mobile banking services are now in use. Innovative banking offers benefits to both banks and customers. Karjaluoto and Pashnila (2004) mentioned two fundamental reasons underlying financial innovation banking development and penetration. First, banks get significant cost savings in their operation through the services. It has been proved that online banking channel is the cheapest delivery channel for banking products once established. Secondly, banks have reduced their branch networks and downsized the number of service staff, which has paved the way to self-service channels as quite many customers felt that branch banking took too much time and effort. However, Customer satisfaction is derived largely from the quality and reliability of banks' innovative products and services (Curry & Curry, 2000). If customers are satisfied, they will buy a lot from vendor and will give vendor a large share of their business. The days of a customer adopting one product or company for life are long gone. With easy access and global competitiveness, customers are often swayed by advertising and a chance at a better deal. Quality levels and features between competing brands and organizations are often comparable. Banks should note that; the thing that separates competitors is their level and quality of service. It is not unusual for customers to switch back and forth between products or organizations simply because of pricing and a bad impression about an organization or lack of quality service.

5.3.1 Financial Incentives

Bank customers are sensitive to incentives in Nigeria. Financial incentives have been moderately helpful in the cause of financial innovation adoption. However, the campaign does not get to those who need it or deserve it. This is because distribution of banks' products souvenir and other gift items is often selectively done or a matter of personal connection or relationship with the bank officials. This means financial incentives are not justifiably used as it often get to wrong hands. Though it is

believedthat incentives cannot buy customers over rather their freewill to adopt, but freewill can be motivated. The Banks seems to have also slowed down on products promotion and distribution of souvenir. Between 2005 and 2008 spending on products advertisement and promotion was running high as much as N45 Million. But products promotion bills came down to N30 Million in 2009 and it has remained around this figure even as at 2014. There might be need to resuscitate this, spend more on advertisement and promotion to improve and encourage the level of patronage, acceptance and adoption of financial innovation. It is suggested in order to curtail incentives distribution abuses, this function could be contracted out to professional organization.

5.3.2 Fraud and Security Risk

Customers are often skeptical of security issues and are afraid of security risks and frauds. Despite its poor reputation on the subject matter, ofall financialinnovationproducts, customers still prefer ATM. For financial innovation to be widely adopted and made popular, fraud and security risk has to be curtailed if not totally removed. Nobody would want to lose his or her hard earned money or investment cheaply. One main essence of banking is security now and in the future. One may as well continue to keep his or her money at home or in other assets, if the banks and their products are not safe and secured. Justice delay is also justice denied, Banks still foot drag in making refund of genuine error. This frustrates genuine customers as it may connote fraudulent tendency and support sharp practices. However people still believes in banking, but banks reputation and associated benefits of FINO can be rubbished and eroded with persistent fraud. It has to be tackled with allseriousness.

5.3.3 Transaction Costs

Generally it is believed that doing business in Nigeria until recently is costly. Individual organization has to provide its own basic amenities for survival, such things as electricity and telecommunication services. It is these operational running costs that swell up bank charges and customers' transaction cost as the costs has to be spread on

financial innovation products and services which has to be provided round the clock. It is generally agreed that for making financial innovation available and accessible the costs are enormous and when passed to the customers it becomes a burden and therefore discourages financial innovation adoption.The crux of the matter is galloping running cost from 2009. The incidence of cost is spread all over and it is common to all components of financial innovation (Dependent Variables). Though costly, the impact of financial innovation is tremendous and it adds value because it is more convenient. Banks should however look into this as customers are ever cost conscious, otherwise high cost will continue tohave a negative influence on financial innovation adoption.

5.3.4 Turnaround Time

The general opinion is that modern banking is faster than traditional banking. But there is a wide variation in time spent or taken to complete a transaction, ranging from 5mins to 3hours, at times two days depending on type of transaction and availability of network and power supply. At times it could be chaotic with long queues, but things are getting better and faster especially with the restructuring of national power generation and distribution and licensing of more telecommunication service providers. The implication of this is that more customers would be served per hour. In 2006,anaverage of 31,250 customers, were served per hour. This plunged down to 6250 customers per hour in 2010. Since then number of customers served on financial innovation products have being increasing though it fell again in 2012-2013 to an average of 28,125 customers per hourprobably due to national electiontension. However, service time per customer has being improving. In 2014 it was 38,750 customers per hour. As more customers are served per hour it means an average customer spent less time to be served. This will translate into improved productivity as precious man labour hour will be saved. From this position as service time improves on financial innovation products and services, it will encourage more people to adopt it and this will enlist buoyant national productivity.

Finally, the banks' huge investment in telecommunication networks and various e-Banking services delivery could be seen as an effort towards measuring up with global standard. This is among other reasons such as increased customer demand, increased

competition among banks, derived minimized cost, new entrants, and better service delivery (Muniruddeen, 2007). To further improve the efficiency of the payment system, the CBN in 2004 issued the broad guidelines on electronic banking (e-banking). E-banking practice in Nigeria will continue to be promoted in line with global trend. With the recent revolution in the telecommunication sector, the environment for efficientinnovative banking service delivery has been laid.

5.4 Recommendations

The Deposit Money Bank is a key important sector in the economy, because of the big roles they play in the financial system. A country is only as strong as its financial system. Their dynamism therefore becomes a must in a developing economy like Nigeria such that they can boost the local commerce and be relevant and competitive in global financial order. Financial innovation adoption therefore becomes a central issue; its growth, process, acceptance and patronage must be continually monitored and upgraded. This study therefore makes several recommendations to stakeholders in the financial sector like the government, policy makers as well as the deposit money banks.

From these research findings: On financial incentives, it has come out clearly that competition and relevance is the order of the day in the global financial world. Therefore, Deposit money banks should realize that gone are the days of arm chair banking, personalized service is a viable option, the use of product advertisement, road shows, product souvenir should be resuscitated and intensified to register various innovation products in the mind of customers and thereby stimulate its demand. Banks should consider coming together on some issues on policy matters, to pressurize the government on interest rate liberation.

On fraud and security risk, though the customers seems to have been contented with the level of security risk and rate of fraud but nobody is ever completely happy when his hard earned money is forcefully or fraudulently taken away from him. Therefore in order to improve and strengthen the rate of financial innovation adoption, security measures

must be tightened, fraud rate must be reduced considerably. Possibility of collaboration with government and private security agents could be considered on ICT fraud prevention and detection but more importantly internal control system must be strengthened.

The study recommends that the government should ensure existence of stable conducive business environment and ensure constant availability of developmental infrastructures like electricity and telecommunication facilities. This will reduce the running cost of financial innovation, Banks must be careful about their charges and the way they transfer costs to customers. From competition point of view, the banks must realize that customers have choice of product and choice of bank. Issue of transaction cost therefore becomes an important strategic matter. Banks should look at and reduce chances of double charging their customers under various disguise, bring down administrative charges and costs and possibly look into areas of operation and price collaboration within themselves in the interest of stepping up general patronage and improvement of financial innovation adoption. Banks can consider venturing into provision of telecommunication providers service, obtain appropriate license either singularly or as a consortium, a move to reduce telecommunication and operational costs, and fast track service delivery: a strategic choice in the interest of their customers and adoption of financial innovation

Broadcasting and communication of timely information on innovative products and services could be taken as part of banks' essential corporate social responsibility. This will enhance organizational reputation from the customers, boost their confidence in the banks and by extension their financial innovation products and services adoption but more importantly a lot of precious staff and customers time will be saved on provision of mundane information every now and then to the customers. Turnaround time and productivity will thereby improve.

5.5 Areas for Further Research

This study was done on quantitative and financial considerations of financial innovation adoption by customers of Deposit money banks in Nigeria. It is recommended that similar studies should be done in other financial services sectors of the economy more so as it afford re-visitation of performance, core competence, comparativeadvantage and marketing strategy analysis. The study focused on determinants of financial innovation adoption precisely looking at quantitative and financial factors only, the study however suggests that further studies should be done on other factors affecting financial innovation adoption, such as customers' perception, behavior and attitude or comparative analysis study.

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APPENDICES

APPENDIX 1:

LETTER OF AUTHORIZATION

Date.....

Managing Director

Name of the Bank.....

P.O BOX.....

Lagos

Dear Sir

RE: ACADEMIC RESEARCH PROJECT

I am a student pursuing a Doctorate Degree in Finance at Jomo Kenyatta University of Agriculture and Technology, Kenya. I am required to undertake a research thesis on **Determinants of Financial Innovation Adoption in Deposit Money Banks Nigeria** in partial fulfillment for the award of this higher degree. I kindly request your assistance in making my research a success.

This purpose of this letter is therefore to request you to grant permission to collect relevant data from your organization from selected respondents among your management staff and customers. The information collected will be treated with utmost confidentiality. The output of this research will add value to banks in Nigeria in terms of appreciating the value and providing missing link on adoption of financial technological innovations from the customers' perspective.

I wish your Bank fruitful business.

Yours Sincerely

Akinyele A. Idowu

(HD435-4448/2013)

APPENDIX 11

LETTER OF INTRODUCTION

To.....

.....

Date.....

Dear Sir/Madam,

RE: COLLECTION OF RESEACH DATA.

I am a PhD student in Finance at Jomo Kenyatta University of Agriculture and Technology, Kenya. Currently I am carrying out a research on **Determinants of Financial Innovation Adoption in Deposit Money Banks Nigeria**. I am in the process of gathering relevant data for this study. You have been identifiIed as one of the collaborators and respondents in this study and I kindly request for your assistance towards making this study a success.

I therefore kindly request you to take some time to respond to the attached questionnaire. I wish to assure you that your responses will be treated with confidentiality, ethical consideration and will be used solely for the purpose of this study.

I thank you in advance for your time and responses. It will be appreciated if you can fill the questionnaire within the next 5days to enable early finalization of the study.

Yours Sincerely,

Akinyele Akinwumi Idowu

(HD435-4448/2013)

APPENDIX III:

RESEARCH QUESTIONNAIRE

Please your assistance in completing the questionnaire attached on **Determinants of Financial Innovation Adoption in Deposit Money Banks Nigeria** will be highly appreciated. This questionnaire is required toassist in determining the objectives of the study. Any information provided will be used for academic purpose only and will be treated in strict confidence. Just put a tick (√) in the appropriate box as you deem fit.

Thank you for agreeing to participate in this academic study.

SECTION A: GENERAL/ DEMOGRAPHIC DATA

INSTRUCTION: Please put a tick (√) against any response that applies to you.

1. Gender: Male [ ] Female [ ]
2. Age: 15-25years [ ] 26-40 years [ ] 41-55 years [ ] Over 55years [ ]
3. Marital Status: Married [ ] Single [ ] Divorce [ ] Widow [ ]
4. Educational Qualification: WAEC/SSCE [ ] ND/NCE [ ] HND/BA/BSC [ ] Post Graduate [ ] Below SCHL CERT [ ]
5. On average please how much do you earn per annum? Under N100,000 [ ] N100,000 - N400,000 [ ]; N400,000 - N720,000 [ ], N720,000–N1,500-000 [ ], Over N1,500,000 [ ]
6. Are you computer literate? Yes [ ] No [ ]
7. How long have been working or dealing with this organisation? 20years and above [ ], 15-19 years [ ], 10-14 years [ ], 5-10 years [ ], Under 5 years [ ].
8. What is your operational spread? All over Nigeria [ ], Lagos and Abuja only [ ], Selected towns and cities [ ], Nigeria and beyond [ ].
9. Where are you permanently based? (Family and relations) location. Just State or Region ……..
10. Are you a User [ ] or Non-User [ ] of Financial technology innovation?

If non-user please give reason(s) …….

11. If user, which of these do you often use? Mobile Banking [ ] Electronic Fund Transfer [ ], Point of Sales Terminal [ ], Automatic Teller Machines[ ], Other devices (Please specify)…….

12. Rank the following infrastructures in order of importance (i.e. 1st, 2nd, 3rd, e.t.c.) the way you think they influence financial innovation adoption; Electricity [ ], Telecom [ ], Education [ ], Environment [ ].

13. Rank the following factors or variables the way you think they influence adoption of financial innovation (i.e. 1st, 2nd, 3rd, e.t.c.). Financial incentives [ ], Financial fraud/risk [ ], Transaction cost [ ], Turnaround time [ ], Developmental infrastructure [ ].

14. How do you think financial innovation has assisted the Nigerian society? Please rank in order of importance. Customers' convenience [ ], Banks' performance [ ], Financial deepening [ ], Commerce growth/competition [ ], International trade [ ].

No	Statement	Strongly disagree	Disagree	Neither agree not	Agree	Strongly agree
		1	2	3	4	5
FINANCIAL INCENTIVES (FI)						
15.	The use of Financial innovation products and services are economical and satisfysing.					
16	Using Financial innovation products boost my personality and enhance my status					
17.	Banks often use interest rate as financial incentive to patronize Financial innovations.					
18.	Corporate gifts, top-up vouchers, special bargain bonuses e.t.c., can entice customers to adopt Financial innovation products.					
19	No amount of incentives can lure customers to adopt Financial innovation, except by freewill.					

20	Banks are fond of using souveneir to entice customers patronage of Financial innovations					
21	Products banners are conspiqously displayed at occasions and locations to sensitize					
22	Financial innovation extra features are advertised by Banks to encourage patronage and adoption					
23	Customers are not aware of financial benefits or incentives to encourage Financial innovation adoption					

SECTION C: FACTORS ON ADOPTION OF FINANCIAL INNOVATION

24. What is your opinion of using Financial incentives to entice customers to patronize Financial Innovations like: Automated Teller Machines (**ATM)**, Point of Sales Terminals **(POS)**, Electronic Fund Tranfer **(EFT)**, Mobile Banking **(MB)** and Internet Banking (**IB**)?.....
.....
.....

24*. Using Financial incentives as criteria for adoption or enticing customers to patronize Financial innovations, tick your most preferred option among these products.

ATM [ ], **POS [ ], EFT [ ], MB** [ ], **IB** [ ], **None** [ ].

No	Statement	Strongly disagree	Disagree	Neither agree not	Agree	Strongly agree
		1	2	3	4	5
TURNAROUND TIME						
25.	Varieties, options and alternative channels abound in financial innovation, no need for unnecessary queue.					

26.	Learning to use financial innovation products can be easy and does not require much mental efforts, hence saves time.					
27.	Operational delays and bank officer interrogation is minimal with financial innovation.					
28.	Financial innovation products remove time space and location barrier thereby enhancing productivity.					
29.	Yuppes and Corporate organizations patronize financial innovation products because it saves time.					
30.	Modern banking transaction is faster than traditional banking transactions.					
31.	Timing banking services and transaction is a fruitless effort.					

32. On average, how long does it take you to complete a transaction under innovative

banking? .....……..

32*. Using Turnaround time as criteria for adoption or enticing customers to patronize financial innovations, tick your most preferred option among these products. Automated Teller Machines (**ATM)** [ ], Point of Sales Terminals **(POS)** [ ], Electronic Fund Tranfer **(EFT)** [ ], Mobile Banking **(MB)** [ ]and Internet Banking (**IB)** [ ] or **None**[ ].

No	Statement	Strongly disagree	Disagree	Neither agree not	Agree	Strongly agree
		1	2	3	4	5
FRAUD RISKS (FR)						
33.	Confidential information is safe between banks and customers.					
34.	With financial innovation there is transparency and accuracy. No room for payment error or fraud					

35.	Incidences of physical robbery conFidential and privacy risks abound in Financial innovation.					
36.	Network failure in Financial innovation gives room to fraudulent practices					
37.	Banks reliability and credibility affect demand and adoption of Financial innovation products.					
38.	Financial claims and litigations as a result of fraud cast doubt on the safety of Financial innovation.					
39.	Level of illiteracy contributes to perpetration of fraud risks in banks.					
40.	Getting refund in case of genuine error in innovative banking is problematic.					
41.	There are enough precautions to frustrate fraud attempts on Financial innovations.					
42.	Government is doing enough to support financial innovation by providing conducive environment for all stakeholders					
43.	Security and fraud risk prevention in financial innovation is a function of Banks size, spread, strategy and policy.					

44. How long does it take to get your refund in the advent of innovative banking transaction error and what do you think is responsible for this? ……..... …….

44*. Using fraud / security risk as criteria for adoption or enticing customers to patronize financial innovations, tick your most preferred option among these products.

Automated Teller Machines (**ATM)** [ ], Point of Sales Terminals **(POS)** [ ], Electronic Fund Tranfer **(EFT)** [ ], Mobile Banking **(MB)** [ ] and Internet Banking (**IB)** [ ] or **None**[ ].

No	Statement	Strongly disagree	Disagree	Neither agree not disagree	Agree	Strongly agree
		1	2	3	4	5
TRANSACTION COST						
46.	Annual charges, subscription fees, and other management charges are unnecessary burden associated with financial innovation					
47.	Acquisition and staff training costs on financial innovation are borne by customers.					
48.	Increases in the cost of making financial innovation widely accessible and available reduce its acceptance.					
49.	Cost of running Financial innovation products on generating set is detrimental to its adoption.					
50.	Cost of switching to innovative banking is discouraging to would be users of innovative banking.					
51.	Financial innovations are competition and marketing tool for Financial deepening and inclusion, with cost implications.					

52. Operation of Financial innovation in Nigeria banking sector is a way of forcing products and costs on customers, it add no value. Please comment……

53* Using Transaction cost as criteria for adoption or enticing customers to patronize financial innovations, tick your most preferred option among these products. Automated Teller Machines (**ATM)** [ ], Point of Sales Terminals **(POS)** [ ], Electronic Fund Tranfer **(EFT)** [ ], Mobile Banking **(MB)** [ ]and Internet Banking (**IB)** [ ] or **None**[ ].

SECTION C: CUSTOMERS' OPINION ON FINANCIAL INNOVATION

	Statement	Strongly disagree	Disagree	Neither agree nor	Agree	Strongly agree
		1	2	3	4	5
54.	Social status or Peer group pressure cannot influence ones decision on FTI usage/adoption					
55.	Generally customers are more at home with Traditional banking than Innovative banking					
56.	The state of electricity and telecommunication does not affect adoption of financial innovation					
57.	Banking transaction with financial innovation is well secured and fraud free.					
58.	There is adequate information and education on the process, uses and benefits of financial innovation					

59. Which one will you prefer traditional banking or innovative banking? Why?

….....

STAFF OPINION ON FINANCIAL INNOVATION

	Statement	Strongly disagree	Disagree	Neither agree nor	Agree	Strongly agree
		1	2	3	4	5
60.	Income level is not a relevant factors for adoption of Financial innovation in Nigeria					
61.	Operating Financial innovation service in Nigeria is flawless. No security compromise.					
62.	Financial innovation can impact positively on banks performance and deposit base, if the interest rate is right to customers.					
63.	Financial innovation policy/strategy is influenced by size, spread and capital base embracing. No cause for fears					
64	Financial innovations are competition and marketing tool for Financial deepening and inclusion					
65.	Financial innovation products are totally fraud resistant.					

66. How does the availability of developmental infrastructures affect your accessibility to financial innovation products even when you are outside your normal base?

……

APPENDIX IV:

LIST OF RECAPITALISED AND OPERATING BANKS IN NIGERIA

1. Access Bank Plc
2. Citibank Nigeria Limited
3. Diamond Bank Plc
4. Eco Bank Nigeria Plc
5. Enterprises Bank
6. Fidelity Bank of Nigeria Plc
7. First Bank of Nigeria
8. First Monument Bank Plc
9. Guaranty Trust Bank Plc
10. Heritage Bank Ltd
11. Key Stone Bank
12. Main Street Bank
13. Skye Bank Plc
14. Stanbic IBTC Bank Plc
15. Standard Chartered Bank Nigeria Ltd
16. Sterling Bank Plc
17. Unity Bank Plc
18. Union Bank of Nigeria Plc
19. United Bank for Africa
20. Wema Bank Plc
21. Zenith Bank Plc

Source: CBN Statistical Bulletin, (2011).

APPENDIX V:

Sample Size –Departmental Management Staff and Customers per Bank.

Market share % tage	Technology /ICT Department	Operations Department	Individual Customers	Corporate Customers Total

Access Bank Plc	7	5	6	14	5	30
Citibank Nigeria Limited	4	4	5	12	5	26
Diamond Bank Plc	5	3	3	11	5	22
Eco Bank Nigeria Plc	7	5	5	12	6	28
Enterprises Bank	3	4	4	10	4	22
Fidelity Bank Of Nigeria Plc	5	4	5	11	4	24
First Bank Of Nigeria	7	5	6	15	8	34
FIrst Monument Bank Plc	5	4	5	12	6	27
Guaranty Trust Bank Plc	7	5	5	13	8	31
Heritage Bank Ltd	3	4	5	12	4	25
Key Stone Bank	3	3	3	10	4	20
Main Street Bank	3	3	3	10	4	20
Skye Bank Plc	5	4	4	12	5	25
Stanbic IBTC Bank Plc	4	4	4	10	5	23
Standard Chartered Bank Nig. Ltd	5	3	5	10	5	23
Sterling Bank Plc	4	3	3	10	4	20
Unity Bank Plc	4	3	3	10	4	20
Union Bank Of Nigeria Plc	4	3	5	12	6	26
United Bank For Africa	7	5	6	13	6	30
Wema Bank Plc	3	4	4	12	4	24
Zenith Bank Plc	7	6	8	14	8	36
Total Target Population	**100**	**84**	**97**	**245**	**110**	**536**

APPENDIX VI

SECONDARY DATA COLLECTION SHEET

VARIABLES	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
	Financial innovation adoption indices(proxies)										
No of Customers	N/A	15000000	17123290	20527397	19787671	21784813	20381072	22332356	24206641	26151240	31209823
Bank deposit N'M	N/A	1316957.4	1739636.9	2693554.3	4118172.8	5763511.215	5954260.452	6531913.009	8062104.813	8606611.493	11936900
Financial incentives											
Interest rates	N/A	8.68	8.26	9.49	11.95	12.63	7.19	6.30	7.63	6.72	9.89
Products promo and sourvenier		2958975	12876050	36083640	45324000	36776304	33813696	32817456	35869134	31281000	33989568
Other incentives	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
fraud and security											
No of frauds	N/A	1,229	1,193	1,553	2,007	1,764	1,532	2,343	3,380	3,786	10,621
value of frauds (N'm)	N/A	11429.03	4832.35	10005.81	53522.86	41262.00	21291.00	28400.00	18045.00	21795.00	25608.00
Amount of loss (N'm)	N/A	3986.18	2768.66	2870.85	17543.09	7550.00	11679.00	4072.00	4516.00	5756.00	6192.00
turn around time											
Average day service (customer)	N/A	9000.0	12123.3	45274.0	78767.1	78488.1	43810.7	243323.6	262066.4	221512.4	312098.2
Service time per customer before access to the different channels(mins)	N/A	0.795	0.92	1.497	1.737	1.736	1.48	2.227	2.26	2.187	2.335
Service downtimes (days)	N/A	25	23	20	21	24	18	15.5	12.4	8.2	7.8
transaction cost											
Management fee	N/A	13,835,000	15,613,250	21,005,616	23,477,880	24,295,368	28,626,576	41,867,232	47,214,636	105,980,472	125,068,968
Annual fee charge	N/A	678,272.90	997,563.60	1,101,818.60	1,278,144	2,235,685.90	3,509,708.30	4,872,416.70	4,144,714.30	6,541,208.30	4314833.3
Running cost	N/A	171,967,150	190,850,350	189,088,464	204,170,184	221,683,080	279,219,336	495,729,528	651,322,833	704,586,576	771,435,456
Financial innovation adoption											
ATM value of	N/A	45.70	63.20	131.56	399.71	548.60	399.71	1,561.74	1,984.66	2,828.94	3,679.88

transaction (B' N)											
ATM volume of transaction	N/A	12,100,000	15,700,000	60,100,000	109,600,000	109,161,646	60,133,610	347,569,999	375,487,756	295,292,940	400,102,507
POS value of transaction (B' N)	N/A	20.20	6.44	16.12	10.70	11.03	12.72	31.02	48.01	161.02	312.07
POS volume of transaction	N/A	800,000	400,000	1,200,000	900,000	918,256	1,072,426	2,100,673	2,555,045	9,402,255	20,817,423
IB value of transaction (B' N)	N/A	3.00	10.62	25.05	84.20	84.15	25.05	59.61	31.57	47.32	74.04
IB volume of transaction	N/A	200,000	900,000	1,600,000	2,700,000	2,703,516	1,601,086	1,932,355	2,276,464	2,900,473	5,587,081
MB value of transaction (B' N)	N/A	0.10	0.10	0.70	1.30	1.27	6.65	18.98	31.51	142.80	346.47
MB volume of transaction	N/A	40,000	700,000	3,200,000	1,800,000	1,809,251	1,156,533	3,649,374	2,297,688	15,812,435	29,156,406
	Financial innovation source : CBN statistical bulletin, National Bureau of Statistics and Nigeria Interbank Settlement System Reports.										

APPENDIX VI1:

VARIABLES PARAMETER ESTIMATES

mode[a]		B	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Intervalfor Exp(B) Lower Bound	Upper Bound
Point of Sales Terminal	Intercept	2.289	.875	6.838	1	.009			
	TT	.405	.109	13.696	1	.000	1.499	1.210	1.857
	FI	.051	.031	2.711	1	.100	1.052	.990	1.117
	FR	.201	.073	7.643	1	.006	1.222	1.060	1.409
	TC	.270	.096	7.948	1	.005	1.310	1.086	1.582
Internet Banking	Intercept	1.006	.636	2.500	1	.114			
	TT	.017	.025	0.467	1	.494	1.017	.969	1.068
	FI	.282	.045	39.539	1	.000	1.326	1.214	1.447
	FR	.012	.004	7.619	1	.006	1.012	1.004	1.021
	TC	.266	.053	25.371	1	.000	1.304	1.176	1.446
Electronic Fund Transfer	Intercept	.676	.648	1.090	1	.296			
	TT	.206	.125	2.737	1	.098	1.229	.963	1.569
	FI	.029	.024	1.496	1	.221	1.030	.982	1.079
	FR	.145	.028	26.158	1	.000	1.156	1.093	1.222
	TC	.388	.190	4.185	1	.041	1.475	1.016	2.140
Mobile Banking	Intercept	3.261	.652	25.015	1	.000			
	TT	.153	.024	39.472	1	.000	1.165	1.111	1.223
	FI	.126	.024	28.484	1	.000	1.134	1.083	1.188
	FR	.041	.004	107.859	1	.000	1.042	1.034	1.050
	TC	.552	.179	9.506	1	.002	1.738	1.223	2.469

a. The reference category is: Automatic Teller Machine