

**THE EFFECT OF TECHNOLOGICAL INNOVATION ON THE FINANCIAL
PERFORMANCE OF COMMERCIAL BANKS IN KENYA**

By

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DECLARATION

This research project is my original work and has not been submitted for the award of a degree in any other university.

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This research project has been submitted for examination with my approval as university supervisor.

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DEDICATION

I dedicate this work to my daughter Daniella Wambui and niece Caroline Njeri for their support during its preparation: your patience and encouragement as I stayed away for long, either in class throughout the weekends, or in the field was really touching.

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A major research project like this is never the work of anyone alone. The contributions of many different people, in their different ways, have made this possible.

First, I would like to thank God for the wisdom and perseverance that He has bestowed upon me during this research project, and indeed, throughout my life.

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TABLE OF CONTENTS

DECLARATION	II
DEDICATION	III
ACKNOWLEDGEMENT	IV
LIST OF TABLES	VII
LIST OF ABBREVIATIONS.....	VIII
ABSTRACT	X
CHAPTER ONE	1
INTRODUCTION	1
1.1 Background of the Study	1
1.1.1 Technological Innovation	2
1.1.2 Financial Performance	2
1.1.3 Relationship between Technological Innovation and Financial Performance ..	3
1.1.4 Commercial Banks in Kenya	5
1.2 Research Problem.....	7
1.3 Research Objective.....	8
1.4 Value of the Study.....	8
CHAPTER TWO	10
LITERATURE REVIEW	10
2.1 Introduction.....	10
2.2 Theoretical Review	10
2.2.1. Diffusion of Innovation Theory	10
2.2.2 Disruptive Innovation Theory	12
2.2.3 Schumpeterian Theory of Creative Destruction.....	12
2.3 Types of Banking Innovations	14
2.4 Empirical Studies	18

CHAPTER THREE	25
RESEARCH METHODOLOGY	25
3.1 Introduction.....	25
3.2 Research Design.....	25
3.3 Population	25
3.5 Data Collection Procedure.....	26
3.5.1 Data Validation and Reliability.....	26
3.6 Data Analysis	27
3.6.1 Analytical Model.....	27
CHAPTER FOUR.....	29
DATA ANALYSIS AND FINDINGS	29
4.1 Introduction.....	29
4.2 Response Rate	29
4.3 Results/Findings	29
4.4 Interpretation of Findings	34
CHAPTER FIVE	38
SUMMARY, CONCLUSION AND RECOMMENDATIONS	38
5.1 Introduction.....	38
5.2 Summary	38
5.3 Conclusions.....	39
5.4 Recommendations for Policy	40
5.5 Limitations of the Study	41
5.6 Areas for Further Study.....	41
REFERENCES	43
APPENDIX I: CUSTOMER CARE DEPARTMENT QUESTIONNAIRE.....	48
APPENDIX II: POPULATION.....	52
APPENDIX III: INTRODUCTORY LETTER	53

LIST OF TABLES

Table 4.1: Response Rate 29

Table 4.2: Effect of ATMs on Financial Performance 30

Table 4.3: Effects of Credit Cards on Financial Performance 31

Table 4.4: Effects of Online Banking on Financial Performance..... 32

Table 4.5: Effects of Customer Assisted Technology on financial Performance..... 33

Table 4.6:Effects of Customer Transparent Technology on Financial Performance 34

Table 4.7: Regression Coefficients 37

LIST OF ABBREVIATIONS

Adv/Ast	Advance to Asset ratio
ATMS	Automated Teller Machines
CBK	Central Bank of Kenya
CRM	Customer Relationship Management
DDIBS	Diamond Integrated Banking Services
DOI	Diffusion of Innovation Theory
EDP	Electronic Data Processing
ESCA	Electronic Smart Card Account
ICT	Information and Communication Technology
KCB	Kenya Commercial Bank
MICR	Magnetic Ink Character Reader
MIS	Management Information Systems
ROA	Return on Assets
ROE	Return on Equity
SBCs	Session Border Controller
SMS	Short Messaging Services

SSB	Self Serviced Banking
US	United States
VSAT	Very Small Aperture Technology

ABSTRACT

Technological innovation is, currently, recognized as one of the key factors on the firms' competitive advantage as well as a critical element in improving the economic and financial results of firms. Indeed, increased economic and financial performance have been observed among firms capable of using innovation to improve their processes or differentiate their products and services in relation to their competitors.

The present study endeavored to determine the effects of technological innovation on the performance of commercial banks in Kenya. The study, which was a census, employed a descriptive cross sectional design and targeted all the commercial banks in Kenya. Secondary data in form of annual financial reports was obtained from Central Bank of Kenya. In addition, primary data was gathered from personnel from the customer care departments using a structured questionnaire. Data were analyzed using IBM SPSS Statistics 21.0 and involved computation of frequencies, descriptive statistics and multiple regression analysis.

The response rate in the study was 79%. Most of the respondents affirmed the positive impacts of technological innovations including ease of access, convenience, user friendliness among others. The study showed that customer care employees at the banks valued technological innovations. Moreover, the results revealed a positive and significant relationship between banks' performance in terms of profitability and adoption of various technological innovations including customer independent technology, customer assisted technology and customer transparent technology. The combined effect of the predictor variables (customer independent technology, customer

assisted technology and customer transparent technology) was positively correlated with profitability ($r=0.7$) with 50.8% of the variations in profitability of banks in Kenya being explained by the model. The study underscored the need for banks to continuously invest in technological innovations for them to remain highly competitive.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The world banking and financial system is in the throes of a transformation caused by increasing globalization and deregulation. Technological innovations such as those available in ATMs, phone banking, Internet banking, and smartcard applications are taking place at an overwhelmingly fast pace in the global banking industry. Banking can be traced back to the year 1694 with the establishment of the bank of England. The bank was started by a few individuals who were actually money lenders with an aim of lending money at interest (Kariuki, 2005) Massive, rapid, technological innovations (Norton, 1995) are replacing the traditional branch teller. With greater competition brought by deregulation, globalization and widespread mergers and acquisitions taking place in the banking sector, more branches are being closed down and replaced by self serviced banking (SSB) facilities like the ATMs as part of a larger rationalization exercise.

Even with the massive branch network, the use of phone banking and Internet banking is strongly promoted by the banks in addition to ATMs. In today's commercial banking environment information technology, effective service delivery and customer satisfaction are an indispensable competitive strategy. Furthermore, the stiff competition has forced banks to set up and put into effect all necessary decision support technological systems. This enables them to dynamically plan new locations, evaluate their performance, forecast customers' attitude to new offered products and services,

estimate clients' switching behavior, and finally provide marketing support to their geographically separate branches.

1.1.1 Technological Innovation

An innovation is defined as a new idea or a new or substantially improved good or service that has been commercialized or any substantially new improved process for the commercial production of goods and services (Roger, 1995). Fisher (1998) notes technology when applied in today's banking environment falls into three specific categories: customer independent (a technology that involves a customer conducting and completing a transaction with a bank entirely independent of any human contact with the institution e.g. ATMs, phone banking and Internet banking); customer assisted (a bank employee will use customer-assisted technology as a resource to complete a transaction e.g. call centre's customer service officers will use a Customer Relationship Management (CRM) System to understand a customer's profile and provide instant responses to customers' queries on the banking transactions and up-to-date billings (Gutek & Welsh, 1999); and customer transparent Customer technology which represents the real core of bank operations and customers never see it but expect it.

1.1.2 Financial Performance

There are various measures of organizational performance. However the most used is profitability. Profitability measures the extent to which a business generates a profit from the factors of production: labor, management and capital. Profitability analysis focuses on the relationship between revenues and expenses and on the level of profits relative to the size of investment in the business (Gilbert and Wheelock, 2007).

Four useful measures of firm profitability are the rate of return on firm assets (ROA), the rate of return on firm equity (ROE), operating profit margin and net firm income. The ROA measures the return to all firm assets and is often used as an overall index of profitability, and the higher the value, the more profitable the firm business. The ROE measures the rate of return on the owner's equity employed in the firm business. It is useful to consider the ROE in relation to ROA to determine if the firm is making a profitable return on their borrowed money. The operating profit margin measures the returns to capital per dollar of gross firm revenue. Recall, the two ways a firm has of increasing profits is by increasing the profit per unit produced or by increasing the volume of production while maintaining the per unit profit. The operating profit margin focuses on the per unit produced component of earning profit and the asset turnover ratio (discussed below) focuses on the volume of production component of earning a profit (Crane, 2011).

Net firm income comes directly off of the income statement and is calculated by matching firm revenues with the expenses incurred to create those revenues, plus the gain or loss on the sale of firm capital assets. Net firm income represents the return to the owner for unpaid operator and family labor, management and owner's equity. Like working capital, net firm income is an absolute dollar amount and not a ratio, thus comparisons to other firms is difficult because of firm size differences (Gilbert and Wheelock, 2007).

1.1.3 Relationship between Technological Innovation and Financial Performance

Kenya banking sector has witnessed many changes since the beginning of e-banking. Today, customers of banks have efficient, fast and convenient banking services. In line

with rendering qualities and acceptable services, most banks in Kenya are investing large sum of money in information and communication Technology (Aduda & Kingoo, 2012). While the rapid development of information technology has made some banking tasks more efficient and cheaper, technological investments are taking a larger share of bank's resources. Currently, apart from personnel costs, technology is usually the biggest item in the budget of a bank, and the fastest growing one. Another problem associated with this financial innovation is plastic card fraud, particularly on lost and stolen cards and counterfeit card fraud. Banks need to manage costs and risks associated with electronic banking. It is therefore important that e-banking innovations are made by sound analysis of risks and costs associated so that to avoid harms on the bank performance. On one hand the bank performance is directly related to efficiency and effectiveness of electronic banking, but on the other hand tight controls and standards are needed to prevent losses associated with electronic banking. The banks have to balance these two options in order not to impair its overall prosperity. This is only possible if overall effects of electronic banking on the banks and its customers are understood.

Despite the potential benefits of ICT and e-commerce, there is debate about whether and how their adoption improves bank performance. Use of and investment in ICT requires complementary investments in skills, organization and innovation and investment and change entails risks and costs as well as bringing potential benefits. The impact of ICTs and e-business strategies on bank performance are positive overall, but that ICTs are not a panacea in themselves.

Kariuki (2005) argues that there exist positive impacts of e-banking on the turnover and profitability and to a lesser extent on employment, most notably when e-commerce is part of larger business strategies of bank. Further, Kariuki (2005) provides evidence that the use of e-banking can contribute to improved bank performance, in terms of increased market share, expanded product range, customized products and better response to client demand.

1.1.4 Commercial Banks in Kenya

The Kenyan financial sector is generally considered to be more of bank based than market based since capital market is largely underdeveloped and narrow. Bank assets as a percentage of total assets of financial sector are about 57 percent. The vital role played by commercial banks in Kenya in financing economic development brings to forth the need to study the funding structure of commercial banks. The banking environment in Kenya has, for the past decade, undergone many regulatory and financial reforms. These reforms have brought about many structural changes in the sector and have also encouraged foreign banks to enter and expand their operations in the country (Kamau, 2009). Kenya's financial sector is largely bank-based as the capital market is still considered narrow and shallow (Ngugi *et al*, 2006). Banks dominate the financial sector in Kenya and as such the process of financial intermediation in the country depends heavily on commercial banks (Kamau, 2009). In fact, Oloo (2009) describes the banking sector in Kenya as the bond that holds the country's economy together. Sectors such as the agricultural and manufacturing virtually depend on the banking sector for their very survival and growth. The performance of the banking industry in the Kenya has improved tremendously over the last ten years, as only two banks have been put under

CBK statutory management during this period compared to 37 bank-failures between 1986 and 1998 (Mwega, 2009).

The banking sector in Kenya is regulated by the Central Bank of Kenya (CBK). Commercial banks are licensed and regulated under the Banking Act cap 488; deposits taking micro finance institutions are regulated under Micro Finance Act and the Forex Bureaus under the Central Bank of Kenya Act cap 491. For the quarter ended June 30, 2012, the sector comprised 43 commercial banks, 1 mortgage finance company, and 6 deposit taking microfinance institutions, 5 representative offices of foreign banks, 115 foreign exchange bureaus and 2 credit reference bureaus. Out of the 44 institutions, 31 are locally owned and 13 are foreign owned. The locally owned financial institutions comprise 3 banks with significant shareholding by the Government and State Corporations, 27 commercial banks and 1 mortgage finance institution (CBK, 2012).

Commercial Banks are further classified into three different classes depending on the market share by net assets, advances, customer deposits and pre-tax profits by Central Bank of Kenya. Large banks have asset size of over 15 billion shillings, medium more than 5 billion shillings and small with asset size of less than 5 billion shillings. Nineteen banks are classified as large, fourteen as medium and twelve as small (CBK, 2009). Only nine commercial banks are listed in the Nairobi Stock Exchange (Barclays Bank, CFC Stanbic Holdings, Diamond Trust Bank, Equity Bank, Kenya Commercial Bank, National Bank of Kenya, NIC Bank, Standard Chartered Bank and The Co-operative Bank of Kenya).

The Kenyan Banking Sector continued on a growth trajectory with the size of assets standing at KSh. 2.2 trillion, loans & advances worth Ksh. 1.3 trillion, while the deposit base was KSh. 1.7 trillion and profit before tax of Ksh. 53.2 billion as at 30th June 2012. During the same period, the number of bank customer deposit and loan accounts stood at 14,893,628 and 2,051,658 respectively. The major forces shaping the structure of the industry and competitive advantage are; increased competition from new market entrants, competition from non-traditional sources like co-operatives and micro-finance institutions, changes in customer tastes, the CBK (amendment) Act 2000 (Donde bill) and changes in technology (Internet banking, Short Messaging Services (SMS) banking, M- pesa and Very Small Aperture Technology (VSAT).

1.2 Research Problem

Despite the potential benefits of ICT and e-commerce, there is debate about whether and how their adoption improves bank performance. Use of and investment in ICT requires complementary investments in skills, organization and innovation and investment and change entails risks and costs as well as bringing potential benefits. The impact of ICTs and e-business strategies on bank performance are positive overall, but that ICTs are not a panacea in themselves.

Kenya banking sector has witnessed many changes since the beginning of e-banking. Today, customers of banks have efficient, fast and convenient banking services delivered through technological innovations such as ATMS, Online Banking, and Mobile banking. The managerial and practical problem that this study wishes to address originates from the observation that technological innovations are risky ventures which are prone to failure, increased fraud and are also prone to exposure inform of litigations

and they may therefore have a resounding positive or negative effect on bank performance depending on the way they are managed.

Aduda and Kingoo (2012) investigated the Relationship between Electronic Banking and Financial Performance among Commercial Banks in Kenya and concluded that there exists positive relationship between e-banking and bank performance. However, the study had a research gap since it did not distinguish between the three categories of technology innovation, namely customer independent, customer assisted and Customer transparent technology. Nyamwembe (2011) conducted a study on factors hindering the adoption of technological innovation by commercial banks in Kenya and took a case study of Kenya commercial bank (KCB). The author concluded that resistance to change, internal politics and fear of cannibalizing existing products hindered adoption. However, he failed to investigate the effect of technological innovation on financial performance of commercial banks. The research question, therefore, is; what is the effect of technological innovations on the financial performance of commercial banks in Kenya?

1.3 Research Objective

To investigate the effect of technological innovation on the financial performance of commercial banks in Kenya

1.4 Value of the Study

The current study may have implications in policy development. The findings from the study may assist the regulators to make guidelines for commercial banks with an intention to adopt technological innovations. For instance, banking firms may need

guidance on how to go about adopting innovations and how to ensure that the risk is minimized.

In practice, the study may benefit banking managers as they may use the findings of the study to decide on the innovations (product or process) to adopt. Such innovations may bring sustainability and competitive advantage to banking firms as results of superior financial returns.

Additionally, the study may have implications for theory building as it may contribute to the technological innovations academic discussion. The study results may reduce the inconclusiveness and the wide controversy surrounding the discussion of the technological innovations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews the literature relevant to this study. The theories relevant to the study area are reviewed. In addition, the chapter commences by reviewing the theories that informed the discussion on technological innovation. It then dwelt on the empirical studies that discuss the link between technological innovation and performance of commercial banks.

2.2 Theoretical Review

This section explores the various theories and models that can explain the effect of technological innovation on the financial performance of commercial banks. Several theories were advanced; these include; diffusion of innovation theory, Disruptive Innovation Theory, Schumpeterian Theory of Creative Destruction

2.2.1. Diffusion of Innovation Theory

Rogers' (1995) Diffusion of Innovation (DOI) theory is a popular model used in information systems research to explain user adoption of new technologies. Rogers defines diffusion as 'the process by which an innovation is communicated through certain channels over time among the members of a social society' (Rogers, 1995). An innovation is an idea or object that is perceived to be new (Rogers, 1995).

According to DOI, the rate of diffusion is affected by an innovation's relative advantage, complexity, compatibility, trialability and observability. Rogers (1995) defines relative advantage as 'the degree to which an innovation is seen as being superior to its

predecessor'. Complexity, which is comparable to TAM's perceived ease of use construct, is 'the degree to which an innovation is seen by the potential adopter as being relatively difficult to use and understand'. Compatibility refers to 'the degree to which an innovation is seen to be compatible with existing values, beliefs, experiences and needs of adopters'. Trialability is the 'degree to which an idea can be experimented with on a limited basis'. Finally, observability is the 'degree to which the results of an innovation are visible' (Rogers, 1995).

The diffusion theory is relevant because it explains the reason why banks adopt technical innovations. One of the reasons why banks adopt technical innovations is relevant advantage. This means that banks that adopt technical innovations have relatively better financial advantage than those who do not.

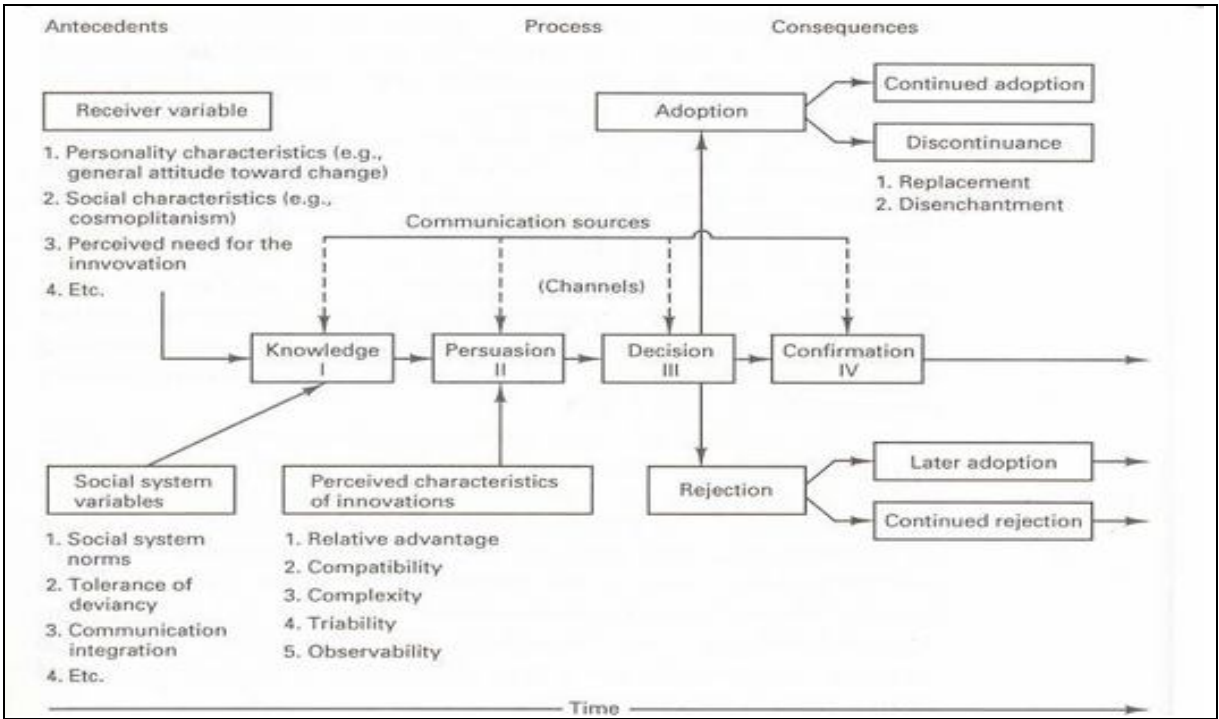


Figure 2. 1: Diffusion of innovation model
Source: Rogers (1995)

2.2.2 Disruptive Innovation Theory

The disruptive innovation is probably one of the most important innovation theories of the last decade. The core concepts behind it circulated so fast that already in 1998, one year after the publication of the theory, people were using the term without making reference to Harvard professor Clayton Christensen or to his book *The Innovator's Dilemma* (Harvard Business School Press). The term disruptive innovation as we know it today first appeared in the 1997 best-seller *The Innovator's Dilemma*. In the book Harvard Business School professor Clayton Christensen investigated why some innovations that were radical in nature reinforced the incumbent's position in a certain industry, contrary to what previous models (for instance the Henderson – Clark model) would predict. More specifically he analyzed extensively the disk drive industry because it represented the most dynamic, technologically discontinuous and complex industry one could find in our economy. Just consider that the memory capacity packed into a square inch of disk increased by 35% per year, from 50 kilobytes in 1967 to 1, 7 megabytes in 1973, 12 megabytes in 1981 and 1100 megabytes in 1995.

Disruptive theory is relevant in that it explains the type of technology banks adopt. The banking technology is disruptive because it does away with traditional banking.

2.2.3 Schumpeterian Theory of Creative Destruction

Schumpeter (1928, 1939) who saw innovations as perpetual gales of creative destruction that were essential forces driving growth rates in a capitalist system. Schumpeter's thinking evolved over his lifetime to the extent that some scholars have differentiated his early thinking where innovation was largely dependent on exceptional individuals willing to take on exceptional hazards as "an act of will", i.e., entrepreneurs, from his

later thinking that recognized the role of large corporations in organizing and supporting innovation. This resulted in his emphasis on the role of oligopolies in innovation and which later was falsely viewed as the main contribution of his work. (Freeman, 1994)

Schumpeter (1928) pointed to the discontinuous and disruptive nature of technological change in capitalism that brings the inseparable combination of short-term instability and long-term growth. He was not a technological determinist but recognized the social and organization forces that played key roles in his cyclical process of industrial change. Schumpeter argued that entrepreneurs, who could be independent inventors or R&D engineers in large corporations, created the opportunity for new profits with their innovations. In turn, groups of imitators attracted by super-profits would start a wave of investment that would erode the profit margin for the innovation. However, before the economy could equilibrate a new innovation or set of innovations, conceptualized by Schumpeter as Kondratiev cycles, would emerge to begin the business cycle over again.

For all his insight on the role of innovation, Schumpeter still did not really explain the source of innovation. He was able to point to its importance and its role in timing economic cycles but did not address its source. This rather interestingly allowed Keynesian economics to argue that levels of investment were the cause of innovation. It was not until the 1960s that economists would begin again to search for the source of innovation. The importance of innovation was highlighted by researchers like Abramovitz (1956) and Solow (1957) who were able to demonstrate how little neo-classical economics was able to explain. Based on data on the United States economy from 1909-49, Solow showed that only 12.5 percent of the increase of per capita output

could be traced to increased use of capital. This left a surprisingly large 87.5 percent residual that Solow attributed to technical change.

Romer (1986, 1994) echoes Solow's observation and continued the call for innovation theorists to internalize the process of innovation within their models. To this end, the work on innovation that emerged from the base set by Schumpeter has been concentrated on the creation of innovation and its subsequent diffusion between firms, industries, and regions.

The Schumpeterian Theory is relevant because new technology replaces old technology which is better because new technology is better and adds value to the adopter.

2.3 Types of Banking Innovations

According to Fisher (1998), technology when applied in today's banking environment falls into three specific categories: customer independent (a technology that involves a customer conducting and completing a transaction with a bank entirely independent of any human contact with the institution e.g. ATMs, phone banking and Internet banking); customer assisted (a bank employee will use customer-assisted technology as a resource to complete a transaction e.g. call centre's customer service officers will use a Customer Relationship Management (CRM) System to understand a customer's profile and provide instant responses to customers' queries on the banking transactions and up-to-date billings (Guttek & Welsh, 1999)); and customer transparent Customer technology which represents the real core of bank operations and customers never see it but expect it.

2.3.1 ATMS

ATMs were introduced first to function as cash dispensing machines. However, due to advancements in technology, ATMs are able to provide a wide range of services, such as making deposits, funds transfer between two or accounts and bill payments. Banks tend to utilize this electronic banking device, as all others for competitive advantage. ATMs also save customers time in service delivery as alternative to queuing in bank halls, customers can invest such timesaver into other productive activities. ATMs are a cost-efficient way of yielding higher productivity as they achieve higher productivity per period of time than human tellers (an average of about 6,400 transactions per month for ATMs compared to 4,300 for human tellers (Rose, 1999). Furthermore, as the ATMs continue when human tellers stop, there is continual productivity for the banks even after banking hours.

2.3.2 Telephone Banking

Telephone banking is a service provided by a financial institution which allows its customers to perform by telephone are known as phone banks (Cronin, 1997). Mostly telephone banking uses an automated phone answering system with phone keypad response or voice recognition capability (Jane Blake, 2000). To guarantee security, the customer must first authenticate through a numeric or verbal password or through security questions asked by a live representative located in a call centre or a branch, although this feature is not guaranteed to be offered 24/7.

According to Leow (1999), telebanking has numerous benefits for both customers and banks. As far as the customers are concerned, it provides increased convenience, expanded access and significant time saving. On the other hand, from the banks'

perspective, the costs of delivering telephone-based services are substantially lower than those of branch based services. It has almost all the impact on productivity of ATMs, except that it lacks the productivity generated from cash dispensing by the ATMs. For, as a delivery conduit that provides retail banking services even after banking hours (24 hours a day) it accrues continual productivity for the bank. It offers retail banking services to customers at their offices/homes as an alternative to going to the bank branch/ATM. This saves customers time, and gives more convenience for higher productivity.

2.3.3 Personal Computer Banking

“PC-Banking is a service which allows the bank’s customers to access information about their accounts via a proprietary network, usually with the help of proprietary software installed on their personal computer”. Once access is gained, the customer can perform a lot of retail banking functions. The increasing awareness of the importance of computer literacy has resulted in increasing the use of personal computers. This certainly supports the growth of PC banking which virtually establishes a branch in the customers’ home or office, and offers 24-hour service, seven days a week. It also has the benefits of Telephone Banking and ATMs (Abor, 2005).

2.3.4 Internet Banking

The idea of Internet banking according to Essinger (1999) is: “to give customers access to their bank accounts via a web site and to enable them to enact certain transactions on their account, given compliance with stringent security checks”. To the Federal Reserve Board of Chicago’s Office of the Comptroller of the Currency (OCC) Internet Banking

Handbook (2001), Internet Banking is described as “the provision of traditional (banking) services over the internet”. Internet banking by its nature offers more convenience and flexibility to customers coupled with a virtually absolute control over their banking. Service delivery is informational (informing customers on bank’s products, etc) and transactional (conducting retail banking services).

2.3.5 Branch Networking

Networking of branches is the computerization and inter-connecting of geographically scattered stand-alone bank branches, into one unified system in the form of a Wide Area Network (WAN) or Enterprise Network (EN); for the creating and sharing of consolidated customer information/records (Abor, 2005). It offers quicker rate of inter-branch transactions as the consequence of distance and time are eliminated. Hence, there is more productivity per time period. Also, with the several networked branches serving the customer populace as one system, there is simulated division of labour among bank branches with its associated positive impact on productivity among the branches. Furthermore, as it curtails customer travel distance to bank branches it offers more time for customers’ productive activities.

2.3.6 Electronic Funds Transfer at Point of Sale (EFTPoS)

An Electronic Funds Transfer at the Point of Sale is an on-line system that allows customers to transfer funds instantaneously from their bank accounts to merchant accounts when making purchases (at purchase points). A POS uses a debit card to activate an Electronic Fund Transfer Process (Chorafas, 1988). Increased banking productivity results from the use of EFTPoS to service customers shopping payment

requirements instead of clerical duties in handling cheques and cash withdrawals for shopping. Furthermore, the system continues after banking hours, hence continual productivity for the bank even after banking hours. It also saves customers time and energy in getting to bank branches or ATMs for cash withdrawals which can be harnessed into other productive activities. As the importance of innovation in developing countries increases, so does the need for research on the subject.

2.4 Empirical Studies

Aragba-Akpore (1998) wrote on the application of information technology in Nigerian banks and pointed out that IT is becoming the backbone of banks' services regeneration in Nigeria. He cited the Diamond Integrated Banking Services (DIBS) of Diamond Bank Limited and Electronic Smart Card Account (ESCA) of All States Bank Limited as efforts geared towards creating sophistication in the banking sector. Ovia (2000) discovered that banking in Nigeria has increasingly depended on the deployment of Information Technology and that the IT budget for banking is by far larger than that of any other industry in Nigeria. He contended that On-line system has facilitated Internet banking in Nigeria as evidenced in some of them launching websites. He found also that banks now offer customers the flexibility of operating an account in any branch irrespective of which branch the account is domiciled. Cashless transactions were made possible in our society of today.

In a study conducted by Irechukwu (2000) in Nigeria, he lists some banking services that have been revolutionized through the use of ICT as including account opening, customer account mandate, and transaction processing and recording. Unlike the aforementioned

studies, Mantel (2000) focuses on the demand-side of electronic/online bill payment – empirically analyzing the demographic characteristics of users. Among other things, the author finds that electronic bill payers tend to be: older, female, higher income, and homeowners. Agboola (2001) studied the impact of computer automation on the banking services in Lagos and discovered that Electronic Banking has tremendously improved the services of some banks to their customers in Lagos. The study was however restricted to the commercial nerve center of Nigeria and concentrated on only six banks. He made a comparative analysis between the old and new generation banks and discovered variation in the rate of adoption of the automated devices.

The primary line of research relating to online banking has been aimed at understanding the determinants of bank adoption and how the technology has affected bank performance. The survival of an enterprise in the age of knowledge-based economy depends on how to improve their organizational innovation capability. Technological innovation is the key variable and means of differentiation between logistics service providers. Commercial banks can increase their performance by employing new technologies. They should employ new information technologies to raise their service capability in the e-commerce age (Agboola, 2001). In terms of online adoption, Furst, Lang, and Nolle (2002) find that U.S. national banks (by the end of the third quarter of 1999) were more likely to offer transactional websites if they were: larger, younger, affiliated with a holding company, located in an urban area, and had higher fixed expenses and non-interest income.

The ICT products in use in the banking industry in many developing and developed include Automated Teller Machine, Smart Cards, Telephone Banking, MICR, Electronic

Funds Transfer, Electronic Data Interchange, Electronic Home and Office Banking (Agboola, 2002). According to Yasuharu (2003), implementation of information technology and communication networking has brought revolution in the functioning of the banks and the financial institutions. It is argued that dramatic structural changes are in store for financial services industry as a result of the Internet revolution; others see a continuation of trends already under way. Information and Communication Technology has provided self-service facilities (automated customer service machines) from where prospective customers can complete their account opening documents direct online. It assists customers to validate their account numbers and receive instruction on when and how to receive their cheque books, credit and debit cards (Agboola, 2004).

According to Agboola (2004), the application of information and communication technology concepts, techniques, policies and implementation strategies to banking services has become a subject of fundamental importance and concerns to all banks and indeed a prerequisite for local and global competitiveness. ICT directly affects how managers decide, how they plan and what products and services are offered in the banking industry. It has continued to change the way banks and their corporate relationships are organized worldwide and the variety of innovative devices available to enhance the speed and quality of service delivery (Agboola, 2004).

However, most research about innovation focused on manufacturing industries though increasing attention has been paid to innovation in service industries recently (Gallouj, 2002; Howells and Tether, 2004; Miles, 2004). Sebastian and Lawrence (2004) in their paper titled “Customer Focus in Banking Services” had stressed on importance of customer relationship management. The aim of the banks should be to retain the existing

customers and acquire the new customers. In order to add value to the services offered, the banking industry has to efficiently and effectively utilize the technology with an eye on the cost of product and the services offered. To win the customers, the modern banking should integrate technology and deploy marketing strategies that would enable banks to maximize profits through customer satisfaction. In market with fierce competition providing the customers with value addition is the only way to achieve complete sustained customer satisfaction.

Turning to online bank performance, DeYoung, Lang, and Nolle (2007) report that Internet adoption improved U.S. community bank profitability – primarily through deposit-related charges. In a related study, Hernando and Nieto (2007) find that, over time, online banking was associated with lower costs and higher profitability for a sample of Spanish banks. Both papers conclude that the Internet channel is a complement to – rather than a substitute for – physical bank branches.

The empirical literature studying SBCs has focused on the determinants of bank adoption and diffusion of this technology, as well as on how SBCS has affected credit availability. Two studies have statistically examined the determinants of the probability and timing of large banks' adoption of SBCs. Frame, Srinivasan, and Woosley (2001) and Akhavein, Frame, and White (2005) both find an important role for organizational structure in the adoption decision: banking organizations with fewer bank charters and more bank branches were more likely to adopt and also to adopt sooner. This suggests that large banks with a more “centralized” structure were more likely to adopt SBCs. The use of the SBCs technology still appears to be mostly limited to large banking organizations. However, one recent study suggests that small banks now often make use

of the consumer credit score of the principal owner of the firm (Berger, Cowan, and Frame 2007).

The dramatic increase in individuals' use of the Internet in the 1990s created the possibility of a new organizational form in banking: the Internet-only bank. According to Delgado, Hernando, and Nieto (2007), as of mid-year 2002, there were some 35 Internet-only banks operating in Europe and another 20 in the U.S. However, in Europe, virtually all of these banks were affiliated with existing institutions, while in the U.S. they tended to be de novo operations. This may explain why most/all of the U.S. Internet-only banks have disappeared (through acquisition, liquidation, or closure) or established a physical presence to supplement their Internet base. This suggests that the dominant technology is one of "clicks and mortar

De Young (2001, 2005) finds that, as compared with conventional de novo banks, the Internet de novo banks are less profitable due to low business volumes (fewer deposits and lower non-interest income) and high labor expenditures. However, the author also reports that the financial performance gaps narrow quickly over time due to scale effects. Delgado, Hernando, and Nieto (2007) similarly find that European Internet banks demonstrate technology-based scale economies.

Roselyn and Ngumi (2013) conducted a study on influence of bank innovations on income of commercial banks in Kenya and concluded that bank innovations have a moderate influence on the income of commercial banks in Kenya. Since technological innovation is aggressively and continuously adopted in Kenya, the government should continue to provide more incentives for research and development to researchers to continue investing their time and skills in discovering more bank innovations. The

authors recommended that the government should pursue a strategy to provide incentives for technology transfer from more developed economies in order to promote the adoption of world class innovations. More incomes for the banks due to adoption of innovations translates to more jobs and improvement of the country's gross domestic product and therefore contributing to the overall macroeconomic goals of the government (Roselyn and Ngumi, 2013). Mwanja and Muganda (2011) have produced mixed results regarding the impact of innovations on bank performance while Mwanja and Muganda (2011) concluded that financial innovation had significant contribution to bank performance.

Gakure and Ngumi (2013) did a study on whether bank innovations influence profitability of commercial banks in Kenya and concluded that bank innovations had a statistically significant influence on bank profitability. This means that the combined effect of the bank innovations in this research is statistically significant in explaining the profits of commercial banks in Kenya. Banks in Kenya have achieved more than a decade of boosting their earning capability and controlling costs through adoption of innovations like the mobile banking, internet banking and recently the agency banking.

2.6 Summary of Literature Review

Aduda and Kingoo (2012) investigated the Relationship between Electronic Banking and Financial Performance among Commercial Banks in Kenya and concluded that there exists positive relationship between e-banking and bank performance. However, the study had a research gap since it did not distinguish between the three categories of technology innovation, namely customer independent, customer assisted and Customer transparent technology. Nyamwembe (2011) conducted a study on factors hindering the

adoption of technological innovation by commercial banks in Kenya and took a case study of Kenya commercial bank (KCB). The author concluded that resistance to change, internal politics and fear of cannibalizing existing products hindered adoption. However, he failed to investigate the effect of technological innovation on financial performance of commercial banks. The research question therefore is; what is the effect of technological innovations on the financial performance of commercial Banks on Kenya.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the research methodology of the study. It describes the research design, sampling design, target population, data collection procedures, analysis management and the ethical considerations in the study

3.2 Research Design

Research design refers to 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 the procedure (Babbie, 2002).

This study employed a cross sectional descriptive design. This design refers to a set of methods and procedures that describe variables. It involves gathering data that describe events and then organizes, tabulates, depicts, and describes the data. Descriptive studies portray the variables by answering who, what, and how questions (Babbie, 2002). A descriptive survey research is a research design that attempts to show the status quo of study items. (Sekaran 2006; Cooper and Schindler, 2006).

3.3 Population

A population is a group of individual persons, objects or items from which samples are taken for measurements, it is the group the investigator wishes to make inferences from (Babbie, 2005). A population refers to an entire group of individuals, events or objects having a common observable characteristic (Mugenda & Mugenda, 2003). The

population in the current study included all the commercial banks in Kenya. This implied that the total population of this study is 43 commercial banks in Kenya (excludes of Charterhouse bank which is under statutory management) as at 31 Dec 2012.

The study involved a census instead of the sample. This is justified since the population is small. The study also enrolled 43 respondents for interviews, one from each bank and specifically from the Customer Care Department.

3.5 Data Collection Procedure

Both primary and secondary data were collected. There are various tools for data collecting but the main ones are questionnaires as discussed by Mugenda and Mugenda (2003). The research instruments in this study were questionnaires. Both open and closed ended questions were applied in collecting primary data. Kothari (2004) noted that, data collection methods for primary data include: structured and semi-structure questionnaires, mailed questionnaires, structured and semi-structured interviews (personal and telephone interviews), observation and focus group discussions. Questionnaires are the most commonly used methods when respondents can be reached and are willing to co-operate. These methods can reach a large number of subjects who are able to read and write independently.

3.5.1 Data Validation and Reliability

The data collection instrument (questionnaire) was tested for validity by subjecting it to the scrutiny of experience bank managers who expressed their opinions as to whether the constructs we were using to measure the concepts were valid.

The reliability of the instrument was achieved after subjecting the questionnaire to a pilot study. Specifically, the questionnaire was subjected to 3 customer care personnel and the reliability coefficient were extracted using SPSS version 17. The cronbach alpha was more than 0.7 which indicated that the instrument was reliable.

3.6 Data Analysis

The data were analyzed by use of descriptive statistics such as mean scores, frequencies, and percentages. Statistical Package for Social Sciences (SPSS) was used to aid in quantitative analysis in this study. The researcher examined the completed questionnaires. The information for each item on the questionnaire was processed and reported through a descriptive statistics. This was accomplished by use of frequencies. The results were presented in tables.

3.6.1 Analytical Model

Multiple regression analysis was used to establish the effect of the independent variables on the dependent variables.

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \mu$$

Where;

Y = Profitability (ROA)

X₁ = Customer Independent Technology

X₂ = Customer Assisted Technology

X₃ = Customer transparent technology

In the model, α = the constant term while the coefficient $\beta_i = 1 \dots 3$ was used to measure the sensitivity of the dependent variable (Y) to unit change in the predictor variables. μ is the error term which captures the unexplained variations in the model.

The strength of the independent variables was tested at a p value of 0.05. This implies that independent variables with a p value of less than 0.05 will be declared to have a significant effect on the financial performance (ROA).

CHAPTER FOUR

DATA ANALYSIS AND FINDINGS

4.1 Introduction

This study sought to establish the effect of technological innovation on the financial performance of commercial banks in Kenya. Data was gathered by use of self-administered questionnaires. The findings of the study are presented based on the objectives of the study.

4.2 Response Rate

Among the 43 questionnaires distributed, 34 were duly filled and returned for analysis. This represented a response rate of 79%. According to Mugenda and Mugenda (2003), a response rate of 50% or more is adequate. Babbie (2004) also asserted that return rates of 50% are acceptable to analyze and publish, 60% is good and 70% is very good. Based on these assertions from renowned research academicians, the responses rate for this study of 79% was considered to be adequate in forming conclusions and generalization of the study population. The response rate matrix is presented on Table 4.1 below.

Table 4.1: Response Rate

Response	Frequency	Percent
Returned	34	79%
Unreturned	9	21%
Total	43	100%

Source: Research Findings

4.3 Results/Findings

This section is arranged based on the objective of the study.

4.3.1 Effect of Customer Independent Technology and Financial Performance

The study sought to establish the effect of technological innovation on performance of commercial banks in Kenya. This section focused on customer independent technology such as ATMs, credit cards and online banking.

4.3.1.1 Effect of ATMs on Financial Performance

The study sought to determine the effect of ATMs on the bank performance. Table 4.2 shows that 82% of the respondents agreed that the ATMS are at convenient places, 73% agreed that the ATMS are user friendly and 85% agreed that bank clients find ATMS easy to use. All the respondents agreed that the ATMS have helped ease congestion in banking halls. The mean score of the responses for this section was 3.96 which indicates that majority of the respondents agreed with the statements regarding the effect of ATMs on bank performance. These results imply that the respondents were happy due to the introduction of ATMs as they would access the banking services at their own time.

Table 4.2: Effect of ATMs on Financial Performance

Statement	strongly disagree	disagree	neutral	agree	strongly agree	Likert Mean
The ATMS are at convenient places	18%	0%	0%	58%	24%	3.71
The ATMS are user friendly	18%	9%	0%	35%	38%	3.68
Bank clients find ATMS easy to use	15%	0%	0%	35%	50%	4.06
The ATMS have helped ease congestion in banking halls	0%	0%	0%	62%	38%	4.38
Overall Likert mean						3.96

Source : Research Findings

4.3.1.2 Effect of Credit Cards on Financial Performance

The respondents were asked to indicate the effect of credit cards on the bank performance. Results on Table 4.3 indicates that 82% of the respondents agreed that the credit cards are user friendly, 67% agreed that bank clients find credit cards easy to use and 79% of the respondents agreed that credit cards are convenient to use and carry around. The mean score of the responses for this section was 3.85 which indicates that majority of the respondents agreed with the statements regarding the effect of credit cards on bank performance. These results imply that the respondents were happy due to the introduction of credit cards as they would do shopping at any place without liquid cash.

Table 4.3: Effects of Credit Cards on Financial Performance

Statement	strongly disagree	disagree	neutral	agree	strongly agree	Likert Mean
The credit cards are user friendly	18%	0%	0%	56%	26%	3.74
Bank clients find credit cards easy to use	15%	15%	3%	32%	35%	3.59
Credit cards are convenient to use and carry around	0%	9%	12%	29%	50%	4.21
Overall Likert mean						3.85

Source : Research Findings

4.3.1.3 Effect of Online Banking on Financial Performance

The study sought to establish the effect of online banking on the bank performance. Results on Table 4.4 reveals that majority (79%) of the respondents agreed that customers did not fear internet banking due to fear of hacking of their accounts by web hackers, 85% agreed that customers were provided with encrypted passwords in order to protect their information and transactions and 65% agreed that internet service was

operated in a restricted and controlled environment in order to safe guard customer information. Sixty seven percent of the respondents agreed that their bank always ensured security of data and information that was operated on the internet banking platform. The mean score of the responses for this section was 3.89 indicating that more employees agreed that on line banking was a key driver of bank performance.

Table 4.4: Effects of Online Banking on Financial Performance

Statement	strongly disagree	disagree	neutral	agree	strongly agree	Likert Mean
Customers do not fear internet banking due to fear of hacking of their accounts by web hackers	3%	12%	6%	35%	44%	4.06
Customers are provided with encrypted passwords in order to protect their information and transactions	3%	6%	6%	41%	44%	4.18
Internet service is operated in a restricted and controlled environment in order to safe guard customer information	8%	15%	12%	27%	38%	3.71
Our bank always ensures security of data and information that is operated on the internet banking platform	15%	15%	3%	32%	35%	3.59
Overall Likert mean						3.89

Source : Research Findings

4.3.2 Effect of Customer Assisted Technology on Financial Performance

The study sought to establish the effect of customer assisted technology on the bank performance. Table 4.5 indicates that 76% of the respondents agreed that customer's call customer care centre's for assistance, 82% agreed that customer service officers use customer relationship management system to understand customers profile and provide instant responses and 76% agreed that banks have set customer care section for all

customer assistance. The mean score for the responses was 4.09 which indicate that many employees agreed that customer assisted technology was a key driver of bank performance. The results revealed that customer assisted technology influenced bank performance.

Table 4.5: Effects of Customer Assisted Technology on financial Performance

Statement	strongly disagree	disagree	neutral	agree	strongly agree	Likert Mean
Customers call customer care centre's for assistance	0%	9%	15%	29%	47%	4.15
Customer service officers use customer relationship management system to understand customers profile and provide instant responses	0%	12%	6%	47%	35%	4.06
Banks have set customer care section for all customer assistance	0%	15%	9%	32%	44%	4.06
Overall Likert mean						4.09

Source : Research Findings

4.3.3 Effect of Customer Transparent Technology on Financial Performance

The study sought to establish the effect of customer transparent technology on the bank performance. Table 4.6 indicates that 85% of the respondents agreed that the system was user friendly, 97% agreed that the system was easy to use and 82% agreed that the system added competitive advantage to the bank. Seventy nine percent of the respondents agreed that the system has reduced operation costs for the banks and 85% agreed that the system had helped ease congestion in the banking halls. The mean score for the responses was 4.13 which indicate that many employees agreed that customer transparent technology was a key driver of bank performance. The results revealed that customer transparent technology influenced bank performance.

Table 4.6: Effects of Customer Transparent Technology on Financial Performance

Statement	strongly disagree	disagree	neutral	agree	strongly agree	Likert Mean
The system user friendly	0%	15%	0%	35%	50%	4.21
The system easy to use	0%	0%	3%	62%	35%	4.32
The system added competitive advantage to the bank	0%	18%	0%	56%	26%	3.91
The system has reduced operation costs for the banks	0%	21%	0%	35%	44%	4.03
The system has helped ease congestion in the banking halls	0%	12%	3%	41%	44%	4.18
Overall Likert mean						4.13

Source : Research Findings

4.4 Interpretation of Findings

In order to establish the statistical significance of the independent variables on the dependent variable (profitability) regression analysis was employed. The regression equation took the following form.

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \mu$$

Where;

Y = Profitability (ROA)

X₁ = Customer Independent Technology

X₂ = Customer Assisted Technology

X₃ = Customer transparent technology

In the model, β_0 = the constant term while the coefficient $\beta_i = 1....3$ was used to measure the sensitivity of the dependent variables (Y) to unit change in the predictor variables. μ is the error term which captures the unexplained variations in the model.

The coefficient of determination also called the R square is 50.8%. This means that the combined effect of the predictor variables (Customer Independent Technology, Customer Assisted Technology and Customer transparent technology) explains 50.8% of the variations in profitability of banks in Kenya. The correlation coefficient of 71.3% indicates that the combined effect of the predictor variables has a strong and positive correlation with banks profitability. This also meant that a change in the drivers of technology has a strong and a positive effect on profitability.

Table 4.7 displays the regression coefficients of the independent variables. The results indicated that customer independent technology, customer assisted technology and customer transparent technology are statistically significant in explaining profitability.

Customer independent technology was positive and significantly related to profitability (B=4.859, pvalue=0.000). This implies that an increase adoption and use of customer independent technology by one unit leads to an increase in profitability by 4.859 units. Customer assisted technology were also positively and significantly related to profitability (B=1.330, pvalue=0.011). This implies that an increase adoption and use of customer assisted technology by one unit leads to an increase in profitability by 1.330 units. Customer transparent technology were also positively and significantly related to profitability (B=1.625, pvalue=0.014). This implies that an increase adoption and use of

customer transparent technology by one unit leads to an increase in profitability by 1.625 units

The findings agree with those in Ovia (2000) discovered that banking in Nigeria has increasingly depended on the deployment of Information Technology and that the IT budget for banking is by far larger than that of any other industry in Nigeria. He contended that On-line system has facilitated Internet banking in Nigeria as evidenced in some of them launching websites. He found also that banks now offer customers the flexibility of operating an account in any branch irrespective of which branch the account is domiciled. Cashless transactions were made possible in our society of today.

The findings agree with those in a study conducted by Irechukwu (2000) in Nigeria, who listed some banking services that have been revolutionized through the use of ICT as including account opening, customer account mandate, and transaction processing and recording. The findings agree with those in a study conducted by Agboola (2001) who studied the impact of computer automation on the banking services in Lagos and discovered that Electronic Banking has tremendously improved the services of some banks to their customers in Lagos. The study was however restricted to the commercial nerve center of Nigeria and concentrated on only six banks. He made a comparative analysis between the old and new generation banks and discovered variation in the rate of adoption of the automated devices

The findings agree with those in Yasuharu (2003) who argued that implementation of information technology and communication networking has brought revolution in the functioning of the banks and the financial institutions. It is argued that dramatic

structural changes are in store for financial services industry as a result of the Internet revolution; others see a continuation of trends already under way.

The findings agree with those in a study conducted by, DeYoung, Lang, and Nolle (2007) who reported that Internet adoption improved U.S. community bank profitability – primarily through deposit-related charges. In a related study, Hernando and Nieto (2007) find that, over time, online banking was associated with lower costs and higher profitability for a sample of Spanish banks.

The findings agree with those in a study conducted by Roselyn and Ngumi (2013) who conducted a study on influence of bank innovations on income of commercial banks in Kenya and concluded that bank innovations have a moderate influence on the income of commercial banks in Kenya

Table 4.7: Regression Coefficients

Variable	Beta	Std. Error	t	Sig.
(Constant)	-6.982	2.037	-3.428	0.002
Customer Independent Technology	4.859	1.068	4.55	0.000
Customer Assisted Technology	1.330	0.488	2.726	0.011
Customer Transparent Technology	1.625	0.621	2.618	0.014

Source : Research Findings

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter finalizes the study by providing the summary of key findings, conclusions and recommendations. The summary, conclusions and recommendations are aligned to the specific objective of the study.

5.2 Summary

The current study aimed to explore whether customer independent technology improved bank performance. This was demonstrated by the mean score of responses and also the regression coefficient. The regression results indicated that there was a positive and significant relationship between profitability and customer independent technology. One of the key findings was that customer care employees at the banks valued technological innovations. This was demonstrated by the extent of agreement with the statements in the questionnaire in support of technological innovations. The results also revealed ATMs, credit cards and online banking were a key determinant of banks performance.

The study also sought to establish whether customer assisted technology influenced performance of banks. Results showed that customer assisted technology influenced bank performance. In addition, customer assisted technology was found to be positively related to banks performance but was found to be statistically significant in influencing banks profitability.

The study also explored the influence of customer transparent technology on bank performance. The study findings showed that employees value core banking system as

an ingredient of bank performance. However it was found to be positively related with profitability and statistically significant.

5.3 Conclusions

Based on the objective and the findings of the study the following conclusion can be made:

Technological innovation is a key driver to banks performance. This kind of finding is a familiar as it has been supported by other scholars and hence highlighting the intensity of technological changes in driving banks profitability.

Customer independent technology was found to influence profitability of banks in Kenya. ATMs, credit cards and online banking are therefore important despite it being an expensive investment. Customer independent technology is important in customer retention due to its intrinsic value and also being a deferred consumption.

Customer assisted technology influences banks performance, the employees overwhelmingly agreed with its positive effect on profitability. It can therefore be concluded that the customers are always happy to call customer care which has been set aside by the banks for their queries and assistance.

Customer transparent technology was found to be effective in driving banks performance. It can be concluded that customer transparent technology was statistically significant with profitability. It can be concluded that the core banking system has a great influence on retention of customers and delivering services to all customers.

5.4 Recommendations for Policy

Based on the results, findings and conclusions the following recommendations have been deciphered.

It was found that customer independent technology drives profitability. It is recommended to the bank management to regularly conduct system checks to avoid breakdown of the ATM machines which helps decongest the banking halls. It is recommended that the management conducts a market survey to ensure that the credit card services being offered are acceptable in major shops and organizations are also embracing the use of new technological innovations. It is also recommended that the bank management ensures that internet banking is fully secured with encrypted passwords to avoid hacking of important information for the clients.

Customer assisted technology was found to be a key driver on profitability. It is recommended to the management that they review the existing customer care department and the customer relationship management system to ensure that all customers are attended to at the right time and as per their needs. The bank management should also ensure that the employees in the department have good remunerations to avoid harassing the customers.

Customer transparent technology was found to be a driver in profitability of banks. It is recommended to the bank management to ensure that the systems are well maintained to avoid system error and failures hence avoid major downfall of the banks. It is also recommended that the ICT department should always be up to date on the system upgrade and changes so as to alert customers in advance and avoid putting customers under unnecessary stress and pressure.

5.5 Limitations of the Study

Some of the targeted study participants declined to divulge information by not responding to the questionnaires sent to them. There is a possibility that some crucial information may have been missed from the non-respondents thus introducing a response bias in the current study.

Additionally, a small sample sizes was used in the study and this may restrain generalizability of the study findings. Besides, the present study was conducted in Nairobi City whose banking operating environment may be different from the rural banking environment.

The level of technological awareness of people living in cities about the various services is always assumed to be higher than that of people living in the countryside. These differences may hinder the applicability of the findings generally, thus, confining the usefulness of the finding to urban set up only.

5.6 Areas for Further Study

A study on factors affecting use of internet banking may be done to develop more insight on consumers in order to help commercial banks put these factors into consideration as they develop products which rely on the internet as a key delivery platform.

A study should also be conducted to determine the perceptions of customers on the technological innovations in banks. The study may employ the Technology Acceptance models (TAM) to understand whether customers consider perceived benefits in making a choice of whether or not to use technology which has been sponsored by a bank. For instance, ATM Technology, and Mobile technology.

Comparative studies for Kenyan banks, Ugandan banks and Tanzania banks should be conducted as far as the effect of technological innovations on banking profitability is concerned.

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APPENDIX I: CUSTOMER CARE DEPARTMENT QUESTIONNAIRE

Section 1:

A: Customer Independent Technology

Below are statements on the effect of technological innovation on performance of commercial banks in Kenya. Kindly tick the statement as appropriate on your opinion on each statement.

Key: 1=strongly disagree, 2= disagree; 3=neutral; 4= agree; 5= strongly agree

A1: ATM

The following statements are related to the effect of ATMS on the bank performance.

Kindly tick as appropriate on your opinion on each statement

	strongly disagree	disagree	neutral	agree	strongly agree
The ATMS are at convenient places					
The ATMS are user friendly					
Bank clients find ATMS easy to use					
The ATMS have helped ease congestion in banking halls					

AII: Credit Cards

The following statements are related to the effect of credit cards on the bank performance. Kindly tick as appropriate on your opinion on each statement

	strongly disagree	disagree	neutral	agree	strongly agree
The credit cards are user friendly					
Bank clients find credit cards easy to use					
Credit cards are convenient to use and carry around					

AIII: Online banking

The following statements are related to the effect of online banking on the bank performance. Kindly tick as appropriate on your opinion on each statement

	strongly disagree	disagree	neutral	agree	strongly agree
Customers do not fear internet banking due to fear of hacking of their accounts by web hackers					
Customers are provided with encrypted passwords in order to protect their					

information and transactions					
Internet service is operated in a restricted and controlled environment in order to safeguard customer information					
Our bank always ensures security of data and information that is operated on the internet banking platform					

B: Customer Assisted Technology

The following statements are related to the effect of customer assisted technology on the bank performance. Kindly tick as appropriate on your opinion on each statement

	strongly disagree	disagree	neutral	agree	strongly agree
Customers call customer care centre's for assistance					
Customer service officers use customer relationship management system to understand customers profile and provide instant responses					
Banks have set customer care section for all customer assistance					

C: Customer transparent technology

CI: Core Banking System

The following statements are related to the effect of customer transparent technology on the bank performance. Kindly tick as appropriate on your opinion on each statement

	strongly disagree	disagree	neutral	agree	strongly agree
The system user friendly					
The system easy to use					
The system added competitive advantage to the bank					
The system has reduced operation costs for the banks					
The system has helped ease congestion in the banking halls					

APPENDIX II: POPULATION

	BANK	OVERALL RANK 2011	OVERALL RANK 2010	OVERALL RANK 2009	GRAND RANKING
1	Equity Bank	1	2	2	1
2	Barclays Bank of Kenya	2	1	3	2
3	Kenya Commercial Bank	6	3	1	3
4	Imperial Bank Ltd	4	5	4	4
5	Standard Chartered Bank	3	7	9	5
6	Commercial Bank of Africa	15	9	5	6
7	Stanbic Bank Ltd(CFC STANBIC)	19	4	6	7
8	National Bank of Kenya	16	6	8	8
9	Co-operative Bank of Kenya	9	16	7	9
10	Bank of Baroda Ltd	7	17	13	10
11	NIC Bank Ltd	8	11	18	11
12	I & M Bank	5	23	12	12
13	Citibank Kenya Branch	10	10	22	13
14	Habib Bank AG Zurich	28	8	10	14
15	Diamond Trust Bank Ltd	12	21	15	15
16	Transnational Bank Ltd	25	15	11	16
17	Oriental Comm (Delphis) Bank	24	14	20	17
18	Housing Finance Co of Kenya	21	24	14	18
19	Bank of India Ltd	11	20	30	19
20	Fidelity Commercial Bank	23	13	29	20
21	Family bank	29	12	27	21
22	Prime Bank Ltd	13	35	25	22
23	Victoria Commercial Bank	17	26	31	23
24	Chase Bank Ltd	20	33	21	24
25	Credit Bank Ltd	39	18	19	25
26	Paramount Universal Bank	31	27	24	26
27	Giro Commercial Bank	18	28	37	27
28	Bank Of Africa Kenya	30	22	32	28
29	African Banking Corporation	14	31	40	29
30	K-Rep Bank Ltd	27	30	33	30
31	Guardian Bank Ltd	33	41	16	31
32	Consolidated Bank	35	38	17	32
33	Development Bank	36	32	23	33
34	Gulf African Bank Limited	38	29	26	34
35	Habib Bank Ltd	22	40	38	35
36	Jamii Bora Bank Ltd	42	25	34	36
37	Dubai Bank Kenya Ltd	41	19	43	37
38	Fina Bank Limited	26	37	41	38
39	Middle East Bank (K)	34	34	39	39
40	First Community	37	36	36	40
41	EcoBank K Ltd (EABS Bank)	32	39	44	41
42	Equatorial Commercial Bank	40	43	35	42
43	UBA Kenya Bank Ltd	43	42	42	43

Source: Central Bank of Kenya, 2012.

APPENDIX III: INTRODUCTORY LETTER

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12th June, 2013

Dear Sir/Madam,

RE: DATA COLLECTION

I am a postgraduate student at University of Nairobi where I am undertaking a course leading to a degree in Master of Business Administration. As a part of the requirements for this course I am undertaking a research project entitled; “*The Effect of Technological Innovation on the Financial Performance of Commercial Banks in Kenya*”. The study will endeavor to establish the effect of technological innovation on the financial performance of commercial banks in Kenya. You have been selected to take part in the study by filling the attached questionnaire which will take about fifteen minutes. The information you provide will be treated with utmost confidentiality and privacy and will be used strictly for academic purposes. A copy of the final report will be available to you upon request.

For more information on the study please feel free to contact me via the addresses provided.

Yours sincerely,

Supervisor : Mr Henrick Ondigo

Evangeline Wachira.
