

**THE IMPACT OF ICT ADOPTION ON FINANCIAL PERFORMANCE OF
COMMERCIAL BANKS IN KENYA**

BY:

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DECLARATION

This project is my own original work and to the best of my knowledge it has not been submitted for a degree award in any other University or institution of higher learning.

Signature... Date...].

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This project has been submitted for examination with my approval as University Supervisor g

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Finally and most importantly, I wish to thank my God the Almighty for bringing me this far. I pride in his name because He always makes my dreams come true.

DEDICATION

I would like to dedicate this project to God the Almighty for bringing me this far.

ABSTRACT

The purpose of the study was to establish the Impact of ICT adoption on financial performance of commercial banks in Kenya. Information and communication technology (ICT) has become the heart of the banking sector, while banking industry is the heart of every robust economy. The research design used was Correlation. The population of study was the commercial banks in Kenya. The data collection instrument used was questionnaire which was administered by the researcher through drop and pick method. Responses were grouped into various categories for analysis using descriptive statistics. Statistical Package for Social Sciences (SPSS version 17) was used to analyze the structured questions while the use of descriptive statistics determined frequencies and percentages. The results were presented in prose, tables, bar graphs and charts.

The study found out that ICT improved the operations, improved the liquidity and the asset quality in commercial banks in Kenya. This not only increased their markets but also helped the organizations to remain competitive in the market. ICT also deepen liquidity of banks in existing markets, for example by reducing excessive reliance on a narrow base of depositors for funding and improves on earnings, asset quality and this increased efficiency in the operations as a whole and especially in commercial banks in emerging markets and developing countries such as Kenya.

The research indicates that there is need to adopt ICT innovations in order to improve the commercial banks" financial performance. In technological innovations, the banks should introduce ICT products that are relatively simple and standard and that offer clear value added. The rapid proliferation and diffusion of ICT in the Banking Industry in Kenya provides a platform to use modern technologies to develop operational efficiency and quality of service to attain and retain customers and in the process enhance the financial performance of the commercial banks.

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ABBREVIATIONS

ATM	-	Automated Teller Machine
AVR	-	Automated Voice Response
BACS	-	Bankers Automated Clearing Services
CBK	-	Central Bank of Kenya
EFTPoS	-	Electronic Funds Transfer at Point of Sale
ICT	-	Information, Communication and Technology
PIN	-	Personal Identification Number

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Today's business environment is very dynamic and undergoes rapid changes as a result of technological innovation, increased awareness and demands from customers. Business organizations, especially the banking industry of the 21st century operates in a complex and competitive environment characterized by these changing conditions and highly unpredictable economic climate. Information and Communication Technology (ICT) is at the centre of this global change curve. Laudon and Laudon, (1991) contend that managers cannot ignore Information Systems because they play a critical role in contemporary organization. They point out that the entire cash flow of most fortune 500 companies is linked to Information System.

Information and Communication Technology (ICT) is the automation of processes, controls, and information production using computers, telecommunications, software's and other gadget that ensure smooth and efficient running of activities. It is a term that largely covers the coupling of electronic technology for the information needs of a business at all levels. ICT has surpassed the role of support services or only electronic data processing; its fields of applications are slightly global and unlimited. Its devices especially the Internet and modern computer email facilities have further strengthened early modernizations like the telephone and fax. Other ICT devices include data recognition equipment, factory automation hardware and services, tele-computing and teleconferences using real time and online system, Adeoti, (2005).

Whitten et al. (2004) says that during last decade, high percentage of financial organizations frequently utilizes computer technology to facilitate services; and that the speed of adoption is expected to grow further as the technology expands. The revolution of information technology has influenced almost every facet of life, among them is the banking sector. The introduction of electronic banking has revolutionized and redefined the way banks were operating. As such technology is now considered as the main contribution for the organizations' success and as their

core competencies. So the banks, be it domestic or foreign are investing more on providing to the customers with the new technologies through electronic banking.

Berger, (2003) says that managers cannot ignore Information Systems because they play a critical role in contemporary organization. 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.

1.1.1 ICT in the Banking Industry

Computers have been used in the banking industry since the international Business Machine (IBM) computers were introduced in 1980s. However, their impact was limited because there were not enough of them. As technology has already advanced, it has become a major influence in the banking industry (Curtain 1998). With the ambitious advancement in IT, a number of banks have been seen in their latest move in a decade of banking industrial upheaval, brought about by enormous advance in IT. This development has affected nearly all aspects of the banking industry (International Society for Technological Advancement in Banking - 1998). The improvement in Information and Communication Technology (ICT) has enhanced the creation of new business models and has revolutionized the distribution channels of financial system resulting in not only a reduction in the transaction costs but also has improved the convenience and accessibility for the customer.

Banks have made extensive use of Information and Communication Technology- (ICT) for many years in operations. The following Information and Communication Technology (ICT) Systems have made great impact on the banking activities;

Banker's Automated Clearing Services (BACS) use computers to carry out most financial transactions between banks. These consist of, clearing cheques, paying salaries, payment of standing orders or direct debits. The BACS does its processing by batch processing in which all transactions from the previous day are processed at one time. The processed data is passed between banks on magnetic tapes. Logs are kept of all the transaction (Abernathy 2005).

Rose (1999) describes Automated teller machines (ATMs); "An ATM combines a computer terminal record keeping system and cash vault in one unit, permitting customers to enter the bank's book keeping system with a plastic card containing a Personal Identification Number (PIN) or by punching a special code number into the computer terminal linked to the bank's computerizes records 24 hours a day" once access is gained, it offers several retail banking services to customers. They are mostly located outside of banks, allowing customers to have access anytime of the day. ATMs are able to provide a wide range of services, such as making deposits, fund transfer between two accounts and bill payments.

Telephone Banking also called "Telebanking" can be considered as a form of remote or virtual banking, which is essentially the delivery of branch financial services via telecommunication devices where the bank customers can perform retail banking transactions by dialing a touch-tone telephone or mobile communication unit, which is connected to an automated system of the bank by utilizing Automated Voice Response (AVR) technology" (Balachandher et al, 2001).

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. PC-Banking virtually establishes a branch in the customers' home or office, and offers 24-hour service, seven days a week. It has the benefits of Telephone Banking and

ATMs (Chorafas, 2000).

Electronic Funds Transfer at Point of Sale (EFTPoS) 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 Funds Transfer Process (Chorafas, 2000). 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.

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" 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). As an alternative delivery conduct for retail banking, it has all the impact on productivity imputed to Telephone Banking and PC-Banking. It is most cost-efficient technological means of yielding higher productivity. It eliminates the barriers of distance, time and provides continual productivity for the bank to beyond belief distant customers.

1.1.2 Commercial Banks in Kenya

In Kenya, the Banking sector is composed of the Central Bank of Kenya, as the regulatory authority and the regulated, Commercial Banks, Non-Bank Financial Institutions and Forex Bureaus. As at 31st Dec 2011 the banking sector comprised 45 institutions, 43 of which were commercial banks and mortgage finance companies. Commercial banks and mortgage finance companies are licensed and regulated under the banking Act 488 and Prudential Regulations and regulated under the Central Bank of Kenya (CBK) Act Cap 491. Out of the 45 commercial bank institutions, 33 were locally

owned and 12 were foreign owned. The locally owned financial institutions comprised 3 banks with significant government shareholding, 28 privately owned commercial banks and 2 mortgage finance companies (NIFC's). Of the 42 private banking institutions in the sector, 71% are locally owned and the remaining 29% are foreign owned. Performance of the banking sector was rated strong as institutions achieved satisfactory financial conditions and improved operations results despite high market competition as each of these institutions scramble for a significant market share. New products have been introduced in the market as a result of rising competition. The system remained well capitalized. Shareholder's funds, deposits and assets increased by 35.2%, 27.7% and 31.9% respectively (CBK 2012).

1.1.3 Financial Performance and Financial Institutions

Financial soundness is a situation where depositors' funds are safe in a stable banking system. The financial soundness of a financial institution may be strong or unsatisfactory varying from one bank to another (Bank of Uganda, 2002). External factors such as deregulation; lack of information among bank customers; homogeneity of the bank business, connections among banks do cause bank failure. Some useful measures of financial performance which is the alternative term as financial soundness are coined into what is referred to as CAMEL. The acronym CAMEL refers to the five components of a banks condition that are assessed: Capital adequacy, Asset quality, Management, Earnings, and Liquidity. A sixth component, a bank's sensitivity to market risk, was added in 1997, hence the acronym was changed to CAMELS. (Note that the bulk of the academic literature is based on pre-1997 data and is thus based on CAMELS ratings.) Ratings are assigned for each component in addition to the overall rating of a banks financial condition (Jose, 1999). The ratings are assigned on a scale from 1 to 5.

Capital adequacy: this ultimately determines how well financial institutions can cope with shocks to their balance sheets. The bank monitors the adequacy of its capital using ratios established by The Bank For International Settlements. Capital adequacy in commercial banks is measured in relation to the relative risk weights assigned to different category of assets held both on and off the balance sheet items (Bank of Uganda, 2002).

Asset Quality: The solvency of financial institutions typically is at risk when their assets become impaired, so it is important to monitor indicators of the quality of their assets in terms of overexposure to specific risks trends in non-performing loans and the health and profitability of bank borrowers especially the corporate sector. Credit risk is inherent in lending, which is the major banking business. It arises when a borrower defaults on their repayments may face cash flow problems, which eventually affect its liquidity position. Ultimately, this negatively impacts on the profitability and capital through extra specific provisions for bad debts (Bank of Uganda, 2002).

Earnings: The continued variability of a bank depends on its ability to earn an adequate return on its assets and capital. Good earnings performance enables a bank to fund its expansion, remain competitive in the market and replenish and/or increase its capital (Bank of Uganda 2002). A number of authors have argued that, banks that must survive need: Higher Return on Assets (ROA), better return on net worth/Equity (ROE), sound capital base i.e. capital Adequacy Ratio (CAR), adoption of corporate governance ensuring transparency to stakeholders that is equity holders, regulators and the public.

Liquidity: Initially solvent financial institutions may be driven toward closure by poor management of short term liquidity. Indicators should cover funding sources and capture large maturity mismatches. An unmatched position potentially enhances profitability but also increases the risk losses (Bank of Uganda, 2002).

Generally, literature on corporate governance comprises attributes such as financial transparency, disclosure and trust among others and it is revealed that financial transparency and disclosure enhance trust between the stakeholders and organizations like commercial banks. Capital Adequacy, Earnings and Liquidity are the key dimensions of measuring financial performance in Commercial banks.

Another way of measuring the performance of the banks in terms of profitability is by the use of Return on Equity. Return on Equity (ROE) is a great overall measure of a company's profitability because it measures the efficiency with which a company uses

shareholders' equity. As a rule of thumb, firms that are consistently able to post ROEs above 20% are generating solid returns on shareholders' money, which means they are likely to have economic moats. Significantly, Return on Equity can tell us more than just the efficiency of using shareholders capital. ROE provides a direct peek into how well a firm balances - profitability, asset turnover and financial leverage - to provide decent returns on shareholders' equity.

Return on Equity is simply calculated by dividing annual earnings divided by shareholders' Equity. Annual Earnings can be taken from the Consolidated Profit and Loss Statement from the firm's Annual Reports. The Shareholders Equity can be found in the Balance Sheet filed in the firm's Annual Reports. Annual Reports can usually be found at the firm's website. Shareholders Equity is simply the difference between Total Assets and Total Liabilities -the assets that the business has generated. Shareholder equity is an accounting term that represents the assets created by the retained earnings of the business and the paid-in capital of the owners.

1.2 Statement of the Problem

In recent years, the utilization of information technology has been magnificently increased in service industries, particularly, the banking industry, which by using Information Technology related products such as internet banking, electronic payments, security investments, information exchanges (Berger 2003), financial organizations can deliver high quality services to client with less effort and in the process improving the bank's earnings. Recent literatures show that the relationship concerning Information technology and banks performances have encouraging outcomes. Information technology can bring down the operational costs of the banks (the cost advantage) and hence improve its financial performance. For instance, internet technology facilitates and speeds up banks procedures to accomplish standardized and low value-added transactions such as bill payments and balance inquiries processes via online network. Consequently, this technology will help banks concentrate their capitals on exceptional, high- value added transactions such as personal trust services

and investment banking via branches.

Surprisingly, some literatures defend the idea of Solow Paradox in concluding that Information Technology may essentially affect negatively on banks efficiency and may reduce productivity and hence its performance. This notion was noted by Solow (1987), "you can see the computer age everywhere these days, but in the productivity statistics" The paradox has been defined by Turban, et al. (2008) as the "discrepancy between measures of investment in information technology and measures of output at the national level. It was widely believed that office automation was boosting labor productivity (or total factor productivity). However, the growth accounts didn't seem to confirm the idea. From the early 1970s to the early 1990s there was a massive slow-down in growth as the machines were becoming ubiquitous. The productivity paradox has attracted a lot of recent controversy and has grown outside the original context of computers and communications. Some are now arguing that technology in general is subject to diminishing returns in its ability to increase economic growth. In an article by Shu and Strassmann (2005), a survey was conducted on 12 banks in the US for the period of 1989-1997. They noticed that even though Information Technology has been one of the most essential dynamic factors relating all efforts, it cannot improve banks' earnings.

Locally, some research studies have been conducted on technological innovation, Kamotho (2008), study on mobile phone banking usage experience observed that competition triggers innovation and creativity. Continuous innovation not only yield new products but rather promotes efficiency in the performance of activities. Mwangi (2007) carried out a study on factors influencing technological innovation of companies listed at Nairobi Stock Exchange. Mwangi (2007) concluded that Kenyan laws protecting investors were the major factor influencing technological innovation. Mwangi (2007) argued that global financial competition and integration had an influence on financial innovation with increased financial competition amongst financial institutions influencing financial innovation the most. Gitonga (2003) did a study on technological processes and

the perceived role of the CEO in the banking industry while Kihumba (2008), conducted a study on the determinants of technological innovation and its effects on banks performance in Kenya.

1.3 Objective of the Study

The objective of the study is to establish the impact of information, communication and technology adoption on the financial performance of commercial banks in Kenya.

1.4 Significance of the Study

The Banking Industry

The findings of the survey will be used by stakeholders in the Banking Industry to make appropriate decisions towards adoption of different technological channels in delivery of services. They will understand the benefits of adopting electronic banking in their financial institutions. They will also appreciate the impact of information, communication and technology on their financial performance.

The Academicians and Scholars

Future researchers and scholars may use the survey as a source of reference for further research on the same area. Financial / service sector technological innovations and inventions depend on the survey carried out in such areas. It is important to document the research findings for future reference. Scholars will be keen to understand the impact of technology on the financial performance in the banking industry.

The Government

The government will be interested in finding out how technology can be maximized in spurring economic growth in financial institutions. Finally the study is meant to help in bridging the gap that currently exists between technology and service quality of the firms that take up technological innovations.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter reviews the relevant literature to the study. This chapter is divided into smaller sections which include: theoretical issues and empirical reviews.

2.2 Theoretical Review

The adoption of new technologies has been studied through different theoretical frameworks, which include the Diffusion of Innovation Theory; Rogers (1995), the Theory of Reasoned Action; Fishbein and Ajzen, (1975), Technology Acceptance; Model. Davis, (1989) which is the best known and used in the area of information systems.

2.2.1 Innovation Diffusion Theory

Rogers (1983) explained the process of technological diffusion as one which is dictated by uncertainty reduction behavior amongst potential adopters during the introduction of technological innovations. Even though innovations typically offers its adopters novel ways of tackling day to day problems, the uncertainty as to whether the new ways will be superior to existing ones presents a considerable obstacle to the adoption process. To counter this uncertainty, potential adopters are motivated to seek additional information, particularly from their workplace peers (Brancheau &Wetherbe, 1990).

Innovation diffusion theory consists of major components: innovation characteristic, individual user characteristic, adopter distribution overtime, diffusion networks, innovativeness and adopter categories, and the individual adoption process (Taylor & Todd. 1995(b)],

Arguably the most popular of the six components of IDT centers on the characteristics of the innovation itself .After analyzing a variety of previous innovation diffusion studies, Rogers (1983) singled out the following five characteristics of innovations that consistently influence the adoption of new technologies.

First, Relative advantage that is the degree to which an innovation is perceived to be an enhancement of the current offerings. Secondly, Compatibility that refers to the extent to which an innovation is perceived to fit together with potential adopters' habits and practices. Third, Complexity that refers to the degree to which an innovation is perceived being complicated to use. Fourth, Observability that is the degree to which results of an innovation are observable to others. Fifth, Trialability that refers to the degree to which an innovation may be sufficiently tested prior to adoption.

In the domain of information systems, Moore & Benbasat [1991] built on the work of Rogers, amongst others and expanded the array of innovation characteristics to seven. Three of the seven innovation characteristics are directly borrowed from Rogers; relative advantage, compatibility and trialability. The fourth characteristic, ease of use is a close relative to Rogers's complexity. It is worth noting that both relative advantage and ease of use are subjective characteristics since they can be viewed differently depending on an individual's perception.

Moore Benbasat (1991) derived three further characteristics. While Rogers (1983) included image as an internal component of relative advantage, Moore and Benbasat found it to be an independent predictor of adoption. Image is the self perception that adopting an innovation could result in enhanced social status for an individual among his/her peers (Agarwal Prasad, 1997). The final pair of characteristics, results demonstrability and visibility are derived from Roger's observability characteristics. Result demonstrability is defined as the tangibility of the results of adopting an innovation, and visibility as the degree to which perspective users see an innovation as being visible in the adoption context (Moore & Benbasat, 1991; Agarwal (Prasad, 1997). Moore Benbasat (1991:1996) reminds us, however that these definitions are infact, "based on perceptions of the innovation itself, and not on the perceptions of actually using the system." As Fishbein and Ajzen (1975) concur, attitudes towards an object and attitudes regarding a particular behaviour relating to that object can frequently differ.

The Innovation Diffusion Theory is of significance to the study in finding out the impact of ICT adoption on the financial performance of Commercial banks. The theory states that adoption of information and communication technology demonstrates a strong theoretical support towards innovation. According to the theory, a perceived financial benefit has a strong significant relation to ICT adoption. It is this aspect that the study sets to find out. The supply of information is essential in producing faster technology diffusion. The theory is helpful in guiding one to understand the essential components of adoption of ICT by organizations. This is particularly important to the current study that is set out to find the impact of ICT adoption on financial performance of commercial banks. Innovation diffusion theory consists of major components: innovation characteristic, individual user characteristic, adopter distribution overtime, diffusion networks, innovations and adopter categories, and the individual adoption process (Taylor & Todd, 1995). This components are helpful in understanding why the organizations would choose to adopt ICT in their operations and the perceived benefits which is financial performance in our current study.

2.2.2 Technology Acceptance Model (TAM)

The Technology Acceptance Model, most known as technology acceptance model (TAM), was proposed by Davis (1989). The intention of the development of the model TAM resulted from an IBM Canada contract with the *Massachusetts Institute of Technology* - MIT, in the 80s to evaluate the market potential to new products of the brand and to make it possible an explanation of the determinants of computers use (Davis; Bagozzi; Warshaw, 1989).

Davis (1989) proposed the TAM to focus in the reason the users accept or reject the information technology and how to improve the acceptance, offering, this way, a support to foresee and explain the acceptance. Davis (1989) conducted a *survey* in a group of 112 users at the Canada IBM and in 40 Master of Business Administration students of Boston University. The validation of the TAM model was based in the acceptance of a software text editor (Davis, 1989; Battacherjee, W. (2000).

Battacherjee, W. (2000) adds that Davis (1989) on this sample found out that the perceived use had higher impact in the behavior than the perceived facility. The TAM has the advantage of being specific to information technology and has a strong theoretical base, besides the wide empiric support, as claims Davis (1989).

The model TAM was designed to comprehend the causal relation between external variables of user's acceptance and the real use of computer, trying to understand the behavior of this user through the utility knowledge and use facility perceived by him (Davis, 1989). For Davis (1989) the people tend to use or not certain technology with the objective to improve his performance at work - perceived use. However, even if this person understand that determined technology is useful, its use may be damaged if it is too complicated, in a way that the effort is not worthwhile the use - perceived facility. This way, the TAM is based basically in two constructs: the perceived utility and the perceived facility, seeing that both measured completely the effects of external variables, such as features systems, development process, training, in the use intention (Davis, 1989). The intention of this model is to represent the impact of external factors related to the information system, under those internals of the individual, as the attitudes and use intentions (Davis; Bagozzi; Warshaw, 1989; Davis 1989; Dillon; Morris, 1996; Lee et al.2003).

According to the model, the use of the information systems would be determined essentially by the use intention that the individual presents. This, in turn, would be determined together by the individual use attitude in relation to the real use of the system and by perceived usefulness, each one exerting a relative weight. This relation between attitude and intention suggests that people form intentions to perform actions to the ones they have a positive feeling. On the other side the relation between perceived usefulness and use intention, is based on the idea that, inside an organizational context, the people form intentions in relation to behaviors which they believe will increase their performance at work. The authors Davis,

Bagozzi, and Warshaw (1989) presuppose that the saved effort, due to the improvement in the perceived usefulness ease may be applied in other tasks, consequently allowing that one person carry out more work with the same effort, this way having a direct effect in the perceived usefulness. Perceived usefulness use has a causal effect in perceived usefulness. The effects of external factors in the use intention are mediated by usefulness and ease (Davis; Bagozzi; Warshaw, 1989; Dillon; Morris, 1996; lee et al., 2003; Battacherjee, W. 2000; Venkatesh et al., 2003).

The theory of Acceptance Model (TAM) is important to the study as it is aimed at predicting and explaining what causes potential adopters to accept or reject the use of information technology. The theory guides us in understanding what influences the use of various ICT components by the commercial banks. Commercial banks use all or some of the following ICT components; mobile banking technologies, electronic money transfers, internet banking transactions, electronic data interchange, ATM deposits and withdrawals, smart cards among others. The theory makes us understand why banks may choose to adopt the various ICT components which may influence the financial performance. For Davis (1989) the people tend to use or not certain technology with the objective to improve performance at work - perceived use. The theory therefore guides us in the study in trying to find out the perceived use of ICT and the financial impact that this will have on the commercial banks in Kenya.

2.2.3 Theory of Reasoned Action

The Theory of Reasoned Action (TRA) was proposed by Fishbein and Ajzen (1975) to explain and predict the people's behavior in a specific situation. TRA is a well-known model in the social psychology domain. According to TRA a person's actual behavior is driven by the intention to perform the behavior. Individual's attitude toward the behavior and subjective norms are the Tloading factors' toward behavioral intention. Attitude is a person's positive or negative feeling, and tendency towards an idea, behavior. Subjective norm is defined as an individual's perception of whether people important to the individual think the behavior should be performed.

The Theory of Reasoned Action is a more general theory than Theory of Acceptance Model (TAM), and has been applied to explain behavior beyond the adoption of technology. However, when applied to adoption behavior, the model includes four general concepts - behavioral attitudes, subjective norms, intention to use and actual use. The inclusion of subjective norm represents an important addition when compared to TAM. In TRA, subjective norm is composed of the user's perception of how others think she should behave, and her motivation to comply with the expectations of these referents, Fishbein and Ajzen, (1975). TRA has been applied in its original form to explain the adoption of ICT-applications, Sindi (1997).

The TRA considers that the people behave in a rational way, evaluating what they have to lose and to win with the manifestation of their attitudes. So, ideas, personal goals, values, beliefs and attitudes influence the behavior they emit at work; if they believe, for example, that to share knowledge will bring them benefits, they will tend to be favorable to the sharing (Fishbein; Ajken, 1979; Davenport; Prusak, 1998).

The theory of reasoned action has already been widely researched and showed success in the prediction and explanation of human behavior in a variety of areas (Davis; Bagozzi; Warshaw, 1989) According to Davis (1986), for being so generalized and also for integrating various theoretical perspectives of psychology, before applied in researches of acceptance of information systems, the TRA should be perfectly appropriate for the study of the determinants of the use of the computer as an specific case.

The theory of Reasoned Action is of significance to the study of the impact of ICT adoption on financial performance of Commercial banks. The theory examines the organizations' intentions or decisions to adopt ICT systems. This is an important process because before an organization benefits from ICT adoption a decision has to be made as to whether this is beneficial. Just as Davis et al (1989) postulates, the Theory

of Reasoned Action is an essential instrument designed to measure the various perceptions that an individual may have of adopting an information technology innovation and the perceived impact on the organization. The theory therefore guides one in finding out the impact of ICT adoption on the financial performance of commercial banks in Kenya.

2.3 Empirical Studies

Electronic banking can benefit financial sector development of emerging countries by lowering costs, increasing the breadth and quality and widening access to financial services. Westphal (2006) analyzed the consumer side for e-banking and the results showed that consumers basically seek for transactional efficiency, choice for core and non-core banking products and access to competitive prices and returns.

Maina (2010) did a survey on the impact of ICT on Business Value Creation in Kenyan Banking Sector. He obtained data from employees of thirty banks out of a population of forty six banks that had recently installed new integrated core banking systems. The survey found out that the adoption of ICT had influenced the content and quality of banking operations thus creating value that enhances financial performance for the banks and customer satisfaction. ICT was found to present great potential for business process re-engineering of Kenyan Banks.

Ayadi (2003) explains that access to electronic means of payment and the high number of customers connected to the Internet has changed the perception of banks toward market and increased the development of Internet Banking. He argues that Internet banking requires a sound security procedure that involves designing effective methods via which users can be authenticated in a remote environment such that transactions being conducted are secured within their respective environments. Internet banking technology has made remarkable changes in the banking industry, which include: cost reduction due to electronic processing carried out on the Internet.

Wilson et al (2003), in their research on Turkish banks concluded that e-banking has a positive impact on the profits of banks. According to their study, "Internet has changed the dimensions of competition in the retail banking sector. It has also provided opportunities for emerging countries to build up their financial intermediation infrastructure. Investment in e-banking is a gradual process. The internet banking variable has had a positive effect on the performance of the banking system in Turkey."

Siam (2006) examined the impact of e-banking on Jordanian banks and concluded that majority of the banks are providing services on internet through their websites and his findings show that the attention is more to achieving e-banking as satisfying and fulfilling customers' needs. He also concluded that there should be a well articulated strategy to achieve success and profits in the long run.

In their research, De Young et al (2007) analyzed the effect of e-banking on the performance of banks by studying US community banks markets and compared the performance of virtual click and mortar banks with brick and mortar banks. Their findings concluded that e-banking improved the profitability of banks hence increasing their revenues. Also, E-banking is largely driven by the factors of minimizing the operating costs and maximizing operating profit, suggests Agboola (2002). According to Dabholka (2002), the e-banking adoption factors are divided into two categories: Factors relating to the infrastructure and accessing technology, factors that are related to retail banking factors. The prior factors include skills on the part of consumers in using internet and other related technologies, attitudes towards technologies, internet penetration rate, privacy and security concerns. Later involves factors like banking culture, e-banking culture, trust in banking institutions and internet banking push. However, lack of PC and internet penetrations serve as barriers for development of e-banking. Also, in their study conducted in Turkish retail banking sector. Hawkins (2001) concluded that e-banking decreases operational costs and it amplifies customers' satisfaction and retention hence increasing the financial performance of the banks.

Ovia (2001) concluded 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.

Ovia (2001) opined that the revolution in ICT has made the banking sector changed from the traditional mode of operations to presumably better ways with technological innovation that improves efficiency. ICT can enhance efficiency via its use and in recent times banks have been encouraged by the rapid decline in the price of ICT gadgets. This has perhaps increased the bank level of ICT usage. The increase might have also been attributable to business environment that became relatively flexible to accommodate new forms of technological change as a result of reforms in the country.

The characteristics of Internet-only start-up (de novo) banks in the late 1990s have received attention from DeYoung (2001a, 2001b). He finds that, as compared with conventional de novo banks, the Internet de novos are less profitable, due to low business volumes (fewer deposits and lower non-interest income) and high labor expenditures. However, DeYoung's research also suggests that the financial performance of de novo Internet banks improves more quickly over time than does that of conventional de novos. He attributes these findings to firstly technology-based learning effects, and secondly technology-specific scale effects. As a result, De Young's findings offer some hope that the Internet-only format may eventually be viable.

Gerstenfield and Wonzel (2007) analyzed the relationship between the usage of internet - based innovation technologies, different types of innovation and financial performance at the firm level. Data for the empirical results shows that internet based innovation

technologies were an important enabler of innovation in the year 2003. It was found that all studied types of innovation, are positively associated with turnover and employment growth. Finally it was found that innovative activity is most of the time associated with higher profitability.

Kozak (2005) investigates the influence of the evolution in Information Technology on the profit and cost effectiveness of the banking zone during the period of 1992-2003. The study indicates optimistic relationship among the executed Information Technology and together productivity and cost savings.

Brynjolfsson and Hitt (2000) indicates that "Information Technology contribute significantly to firm level output." They determine that Information Technology capital contributes an 81% marginal increase in output, whereas non Information Technology capital contributes 6%. Likewise they illustrate that Information System professionals are more than twice as productive as non- Information System professionals.

Inyaga (2002) carried out a study on the Utilization of Information and Communication Technology in the management of University of Nairobi. He used a correlation research design to compare the relationship between the Management and the Utilization of ICT, it was noted that the utilization of ICTs correlated significantly with the library, research and students' academic records management and hence improved the financial performance of the organization.

Egesa (2006) studied Customer Adoption of Tele-banking Technology in the Kenyan banks and found that customers increasingly extend their use of tele-banking as their experience grows with the system and that education played a vital role in the adoption and usage of tele-banking technology. In this study he used a descriptive type of research and made sampling among the commercial banks in Kenya.

Farrell and Saloner (1985) and Economides and Salop (1992), showed that the relationship concerning Information and Communication Technology and banks performance have two encouraging outcomes. ICT can bring down the operational costs of the banks (the cost advantage). For instance, internet technology facilitates and speeds up banks procedures to accomplish standardized and low value added transactions such as bill payments and balance inquiries processes via online network. ICT can promote transactions between customers within the same network (the network effect). ICT has completely been reshaping the landscape and the dimension of competition in the banking industry following the introduction of online banking, ATMs: online banking for the delivery of services and products.

Carlson et al (2000) and Furst et al (2002) conducted an intensive research whether there is a positive relationship that exists between offering electronic banking and banks profitability. Furst et al (2002), reveals that federally chartered US banks had higher Return on Equity (ROE) by using the conventional business model, ICT was one of the major factors that affect banks profitability within the period under study and they also observe that more profitable banks adopt ICT after 1998 but yet they are not the first movers. On the same note, England et al (1998), conducted a study and found no evidence of major differences in performance of electronic banking in the US subject to two caveats: This result may not be the case for all the banks and secondly, such results are open to change over time as banks become more severe in the use of innovation.

While in a similar study in Kansas USA, Sullivan (2000) also found no systematic evidence that multi-channel banks in the 10th Federal Reserve District were either helped or harmed by having transactional web sites. These finding were among the previous findings of Satnye (2005), for the credit unions in Australian banks for the period of 1997 to 2001, shows that electronic banking has not proved to be a yard stick for performance enhancing tool. According to Haq (2005) banks' existence depend on their ability to achieve economies of scale in minimizing

asymmetry of information between savers and borrowers. Today, one of the major challenges facing the banking industry is how ICT has helped banks to sustain the economies of scale whilst shifting from bricks and mortar banking to online.

Claessens et al (2001) buttress that, "Role of ICT in the banking industry can allow global economies to set up a financial system before first establishing a fully functioning financial infrastructure instead. Virtually, since electronic banking is much cheaper, it involves reduced processing costs for providers and less search and switching costs for consumers, banks can promote their services and products involving smaller transactions to lower income borrowers, even in remote areas.

Hernando and Nieto (2007) examined the performance of multichannel banks in Spain between 1994 and 2002. The study found higher profitability for multichannel banks through increased commission income, increased brokerage fees and (eventual) reductions in staffing levels and concluded that the Internet channel was a complement to physical banking channels. In contrast to earlier studies, the multichannel banks in Spain relied more on typical banking business (lending, deposit taking and securities trading). The adoption of the Internet as a delivery channel had a positive impact on banks' profitability after one and a half years of adoption. It was explained by the lower overhead expenses and in particular, staff and IT costs after the same period.

Using information drawn from banks in Italy, Hassan et al. (2003) found that the Internet banking institutions were performing significantly better than the non- Internet groups. Additionally, the risk variables associated with the Internet group continued to be lower relative to the non-Internet group. The asset-liability variables revealed that on average the banks in this Internet group were larger and had significantly higher trading and investment activities and less dependent on retail deposits (both demand and saving deposits) relative to the non-Internet group. The only category where the Internet group showed a lower performance was the non-interest expense category. It found a significant and positive link between offering of Internet banking activities and banks'

profitability and a negative but marginally significant association between the adoption of Internet banking and bank risk levels particularly due to increased diversification.

Simpson, (2002) reveals that electronic banking is motivated largely by the prospects of operating costs minimization and operating revenues maximization. An evaluation of online banking in developed and emerging markets reveals that in developed markets substitute for physical branches for delivering banking services abound.

Sathye (2005) investigated the impact of the introduction of transactional Internet banking on performance and risk profile of major credit unions in Australia. Similar to the results of Sullivan (2000), the Internet banking variable didn't show a significant association with the performance as well as with operating risk variable. Thus, Internet banking didn't prove to be a performance enhancing tool in the context of major credit unions in Australia. It neither reduced nor enhanced risk profile.

2.4 Summary of Literature Review

This chapter has surveyed and summarized the existing theoretical issues and empirical literature on ICT (Information, Communication and Technology) and its impact on the financial performance of commercial banks. Technology has become part and parcel of the banking sector. Banks have really changed the way they do business in terms of their operations, the kind of products and services that they offer to their customers. Banks have utilized technology in the daily provision of services to the customers.

The available literature shows that there exists a strong relationship between technological innovation and financial performance of financial institutions such as banks. As noted by Ayres (2008) technology affects the wealth of companies. There is however need to investigate the specific effects of these technological innovations with a specific reference on banks. This is due to the research gap that exists as there are few studies that have been done to investigate the impact of technology on financial

performance of commercial banks despite their strategic positioning to adopt technological innovations such as electronic banking.

The available literature provided insights on how different technological innovations are adopted in different contexts. Due to contextual, sector and managerial differences among the organizations issues of technological effects on financial performance gained from these studies may be not assumed to explain the impact of technology on financial performance of the commercial banks in Kenya. It is in this light that the researcher carries out a study on the impact of ICT on financial performance of the commercial banks in Kenya.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter discussed the methodology adopted by the researcher in carrying out the study. The chapter also presented the population studied, the methods used to sample it, the instruments used in data collection and procedures that were used in data analysis.

3.2 Research Design

In this study correlation research was used. Correlation studies aims at investigating the existence and the degree of a relationship between two or more quantitative variables. If two variables are highly related, scores on one variable could be used to predict scores on the other variable.

Correlation studies are appropriate when the variables cannot easily be distinguished or the existing situation does not yield to the application of an experimental method of study. In a correlation design, two different methods can be applied. The most commonly known is seen in relationship studies. In these studies, scores obtained from two variables are correlated to determine the relationship. The second method applied in the prediction studies; however, use the scores of one variable to predict the outcome of the other variable. "If a relation of sufficient magnitude exists between two variables, it becomes possible to predict a score on either variable if a score on the other variable is known", Fraenkel & Wallen,(1991).

3.3 Population and Sample

"A population is an entire group of individuals, events or objects having common characteristics that conform to a given specifications" (Mugenda Mugenda, 2003 p9). According to Saunders et al. (2007) the population is the full set of cases from which a sample is taken. The population of study consisted of all the 45 licensed commercial banks that are fully registered with Central Bank of Kenya.

The sample size is the part of the target population that will be selected by the researcher for the purpose of data collection. The study adopted a census study of all the banks. Census study is feasible when the population is small and necessary when the elements are quite different from each other. When the population is small and variable any sample we draw may not be representative of the population from which it is drawn. Therefore it was appropriate for the researcher to choose census method to be used because the population was small and the institutions were easily accessible and reachable.

3.4 Data Collection Procedures and Instruments

Data collection is gathering empirical evidence in order to gain new insights about a situation and answer questions that prompt undertaking of the research. Primary data was collected using a questionnaire with close ended and open ended questions administered to the management staff of the commercial banks. The questionnaire was divided into two parts. The first part was mainly on the background information. This enabled the researcher get an indication of the nature of the employees in the particular bank, while the second part was on Information, communication and technology (ICT) and their impact on performance of the commercial banks in Kenya.

The targeted respondents were senior, middle and low management staff in the respective banks located at the Head offices. One member of staff was targeted in each bank. The population under study was appropriate because it represented several categories in the financial market and in different sizes. The questionnaires were self-administered; the researcher sent them through hand delivery to the respondents and asked them to complete the questionnaires. The researcher made a follow up on the respondents to closely monitor the administration of the questionnaires. Secondary data on financial data was obtained from annual reports of commercial banks filed with the central bank.

3.5 Data Analysis

The whole process which starts immediately after data collection and ends at the point of

interpretation and processing data is data analysis. Cooper & Scindler, (2003). Chandran (2004) defines statistics as a discipline that provides the tools of analysis in research and one which refers to facts, information or data to a system of data collection and analysis. Mugenda (2003) points out it as a process of bringing order, structure and meaning to the information collected. Therefore, editing, coding, classifying and tabulation were the processing steps that were used to process data for better and efficient analysis.

Model Specification

Variables used for the analysis include performance measure (profitability of the bank) and the adoption of ICT by commercial banks. Performance was operationalized using a commonly used accounting-based measure; profitability measured as the ratio of earnings before interest and taxes (EBIT) to equity. Performance is dependent on capital adequacy, asset quality and earning and liquidity which will be included as control variables. A general model for data allowed the study to estimate data with great flexibility and formulate the differences in the behavior of the cross-section elements which were adopted. Adoption of ICT was measured using adoption of mobile banking technologies, adoption of electronic money transfer, internet banking transaction and electronic data interchange.

$$ROE = \beta_0 + \beta_1 MB + \beta_2 EMT + \beta_3 IB + \beta_4 EDI + a$$

Where:

ROE (Return on Equity) is EBIT divided by equity for firm i in time t;

MB adoption of mobile banking technologies

EMT adoption of electronic money transfer

IB adoption of internet banking transaction

EDI adoption electronic data interchange

a is the error term

The questionnaire responses were grouped into various categories for analysis using descriptive statistic. The statistical Package for Social Sciences (SPSS) version 20 was used to analyze the structured questions while the use of descriptive statistics was used to determine frequencies and percentages. The results were presented in prose, tabular and graphic form.

3.6 Data Validity and Reliability

Validity refers to the appropriateness, meaningfulness and usefulness of inferences researcher makes based on the data collected. An appropriate inference is one that is relevant to the purpose of the study while a meaningful inference is one that says something about the meaning of the information obtained through the use of instrument. The results of the assessment should provide useful information about the research questions or variables being measured. The three types of validity are content -related validity, criterion related validity and construct validity (Mugenda and Mugenda, 2003). A questionnaire is said to be valid when it actually measures what it claims to measure. Mugenda and Mugenda (2003) argue that the usual procedure in assessing the content validity of a measure is to use a professional or expert in a particular field. Since the questionnaire was administered to the employees of the banks, the inferences that were made from the data collected were valid.

Reliability is a measure of the degree to which a research instrument yields consistent results or data after repeated trials. Reliability is influenced by random error, which is deviation from a true measurement due to the factors that have not effectively been addressed by the researcher.

Errors may arise from ambiguous instructions to the respondents (Mugenda and Mugenda, 2003). According to them an instrument is reliable when it can measure a variable accurately and consistently and obtain the same results under the same conditions over time. Reliability refers to the consistency of measurement and is frequently assessed using the test -refers reliability method.

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter entails the findings of the study based on the data collected from the field. The analysis focused on establishing the impact of ICT adoption on financial performance of commercial banks in Kenya. Sample size of 45 commercial banks was used whereby 30 successfully responded and the information presented in form of pie charts, bar graphs and tables.

4.2.1 Response Rate

This section sought to show the actual number of respondents who responded in the study against the targeted sample size. The findings are shown in the table 4.1 below

Table 4.1 Response Rate

Respondents	Frequency	Percentage
Non- Respondents	15	33.33%
Actual Response	30	66.67%
Target Population	45	100%

The study established that out of the targeted 45 commercial banks (100%) only 30 (66.67%) managed to respond, however 15(33.33%) did not respond.

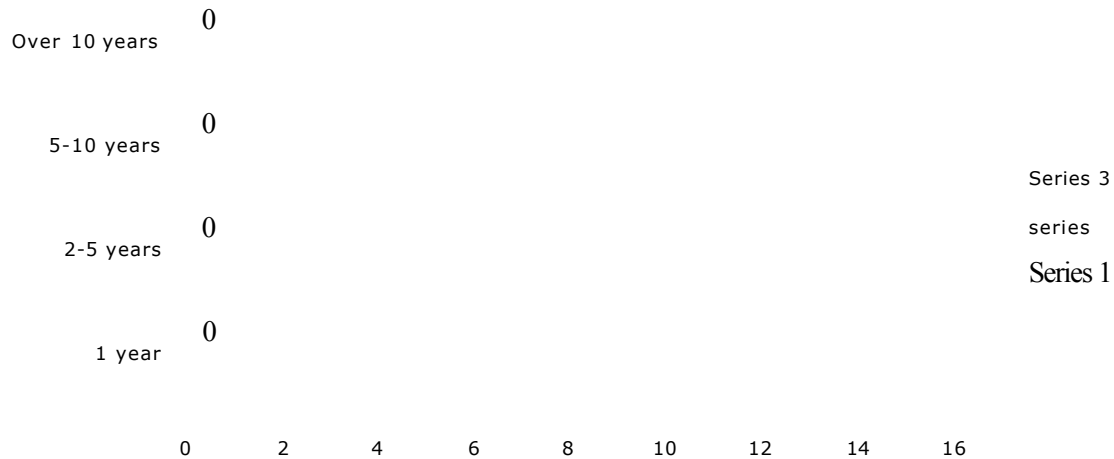
4.2.2 Demographic Information

In order to capture the general information of the respondents, issues such as duration worked at the organization, job designation and level of education were addressed in the first section of the questionnaire. This was important because it enhanced reliability and gave the basic understanding of the respondents.

4.2.3 Working Experience in the Banking Industry

This section sought to establish the working experience in the banking industry that the respondents belonged to. The following figure 4.1 shows the results of the findings

Figure 4.1 Working Experience in the Banking Industry



From the study it was established that majority of the respondents had worked in the banking industry between 5-10 years and were represented by 50%,36.67% were in the period of 2-5 years whereas 13.33% represented those between the period of over 10 years respectively.

4.2.4 Duration Worked in the Organization

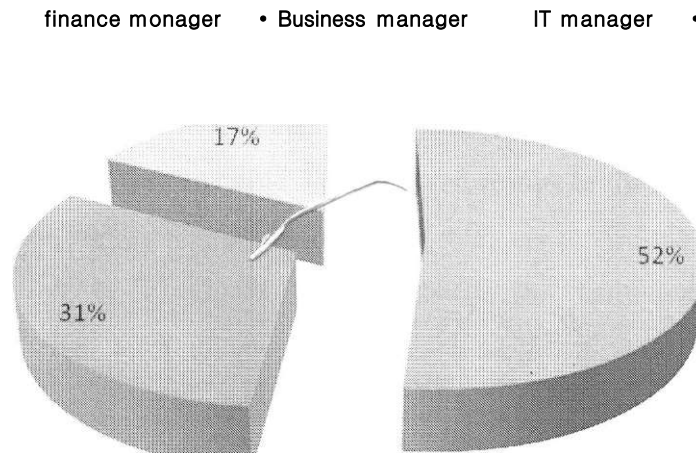
The study sought to establish the period that the respondents who took part in the study had worked in the organization.

The study found out that 46% of the respondents had worked in the organization for a period 2-5 years, 37% indicated that they had worked for 5-10 years while 17% said that they had been in the same organization for a period of 1 year.

4.2.5 Job Designation

This section sought to establish the positions that the respondents who took part in the study held in the organization. The following figure 4.3 shows the results of the findings.

Figure 4.3 Position Held in the Organization



The study indicated that majority of the respondents 52% were the Finance managers in commercial banks, 31% indicated that they were Business managers while a further 17% said that they were the IT managers. These respondents were appropriate since they are highly involved in the operations regarding the information, communication and technology in commercial banks.

4.2.6 Level of Education

The study sought to establish the highest level of education that the respondents had attained.

The study established that those respondents who held senior positions/managerial positions had attained their masters' degree and this was represented by 60% while those who had attained their first degree were represented by 40%. This shows that most of staff and especially in the managerial level are highly qualified.

4.2.7 Capital Adequacy

The study sought to establish how the adoption of ICT had improved the capital adequacy of the commercial banks.

4.2.8 Importance of Adoption of ICT in the Improvement of Capital Adequacy

This section of the study sought to establish the extent to which the respondents agreed on adoption of ICT. The following table 4.2 shows the results of the findings.

Table 4.2 Adoption of Financial Innovation in the Improvement of Capital Adequacy

	Frequency	Percentage
Strongly Agree		76.67%
Agree	7	23.33%
Neither Agree or disagree		
Disagree		
Strongly disagree		
Total	30	100

Majority of the respondents 76.67% strongly agree that the adoption of ICT was very important in the improvement of capital adequacy of commercial banks while a further 23.33% agreed that ICT was essential

4.2.9 Importance of Adoption of Financial Innovation in the Improvement of Capital Adequacy

The study sought to establish how the respondents rated the importance of ICT adoption in the improvement of the capital adequacy and the following table 4.3 shows the findings.

Table 4.3 Importance of Adoption of Financial Innovation in the Improvement of Capital Adequacy

	Frequency	Percentage
Very high	17	56.67%
High	11	36.67%
Moderate	1	0.033%
Low		
Neglible	1	0.033%
Total	30	100

From the table, the respondents rated the importance of ICT as high and this was represented by 56.67% whereas 36.67% rated as high in the improvement of the capital adequacy in the commercial banks. The high results above shows that banks have realized that in order to improve on capital adequacy and remain competitive on the market they need to adopt ICT which should continue to promote safety and soundness in the financial system and as such the new ICT innovations should improve or at least maintain the current overall level of capital in the system.

4.2.10 Extent Which the ICT Adoption has Improved the Capital Adequacy of the Bank

This section of the study sought to establish the extent to which ICT improved the capital adequacy of the bank. The following table 4.4 shows the ratings.

Table 4.4 Extent to Which ICT Adoption has Improved the Capital Adequacy of the Bank

	Frequency	Percentage
Very great extent	9	30%
Great extent	16	53.33%
Moderate extent	4	13.33%
Low extent	1	0.03%
No extent		

Total

30

100

Majority of the respondents 53.33% indicated that ICT had improved the capital adequacy of the bank to great extent whereas a further 30% said that ICT in the banks was to very great extent. 13.33% of the respondent indicated that this was to moderate extent.

4.2.11 Adoption of Various Technological Innovations in Carrying out Business Activities

This section of the study sought to establish how the respondents rated the adoption of the following technological innovations in carrying out business activities. A scale of 1-5 was used where 1 is to great-extent and 5 is to no extent.

Table 4.5 Rating the Adoption of Various Technological Innovations

Technological innovation	Very great extent	Great extent	Moderate	Less extent	Not at all	Mean	Std deviation
Mobile banking technologies	11	12	6	1	1	2.0000	1.00000
Electronic money transfer	19	9	2	1	0	1.6129	1.02233
Internet banking transaction	8	8	11	2	2	2.4194	1.14816
Electronic data interchange	12	7	11	1	0	2.0323	.94812
ATM deposit and withdrawal	15	7	4	5	0	1.9677	1.13970
Smart card	7	12	5	2	5	2.5484	1.36232

From the findings on the respondent rating various adoption of technological innovation, the study found that majority of the respondent rated the following to great extent electronic money transfer as shown by mean of 1.6129, ATM deposit and withdrawal as shown by mean of 1.9677, adoption of mobile banking technologies as shown by mean 2.0, adoption of electronic data interchange as shown by mean of 2.0323 and adoption of

internet banking transaction as shown by mean of 2.4194, adoption of smart cards was rated to moderate extent as shown by mean of 2.5484.

4.2.12 Liquidity

The study sought to establish whether adoption of ICT had improved liquidity in the commercial banks under the study and the following table 4.5 shows the findings on liquidity.

Table 4.6 Whether ICT has Improved Liquidity in the Banks

	Frequency	Percentage
Strongly agree	16	53.33%
Agree	10	33.33%
Neither agree or disagree	1	0.03%
Disagree	3	10%
Strongly disagree		
Total	30	100

Majority of the respondents strongly agreed that ICT had improved liquidity in commercial banks and this was represented by 53.33% whereas 33.33% agreed that ICT in the bank had improved liquidity. The business model for certain banks is based on getting funding from other financial institutions due to lack of customer deposits. As soon as the other financial institutions decline to assist, they are no longer in control of their own destiny hence the high adoption of ICT to improve the liquidity and avoid such a risk.

4.2.13 Asset Quality

The study sought to establish whether ICT in the banks had contributed to the improvement of asset quality. The following table 4.7 shows the results of the findings.

Table 4.7 Whether ICT has Improved the Asset Quality of Commercial Banks

	Frequency	Percentage
Strongly agree	18	60%
Agree	12	40%
Neither agree or disagree		
Disagree		
Strongly disagree		
Total	30	100

The study indicated that majority of the respondents 60% said that ICT had positively improved asset quality in the banks whereas 40% agreed that ICT had improved the asset quality of the banks. The high results shows that commercial banks in Kenya have realized that risks to the solvency of financial institutions most often derive from impairment of assets hence the adoption of ICT so as to improve asset quality and safeguard the assets as well.

4.2.14 Earnings

The following section of the study sought to establish whether ICT had improved the earnings in the banks and trend of growth of profit after tax for the last five years since the bank adopted ICT in its operations. The following table 4.8 shows the results of the findings.

Table 4.8 Whether Financial Innovations has Improved the Earnings in the Banks

	Frequency	Percentage
Strongly agree	24	80%
Agree	6	20%
Neither agree or disagree		
Disagree		
Strongly disagree		
Total	30	100

From the table, the study indicated majority of the respondents strongly agreed that ICT had improved the earnings in the banks and this was represented by 80% while a further 20% agreed that ICT had improved profitability in commercial banks.

4.2.15 Trend of Growth in Earnings

The following section of the study sought to show the trend in growth of earning for the last five years since the bank adopted ICT. The following table 4.9 shows the growth in earnings.

Table 4.9 Aspect of Performance

Aspects of Performance	2006-100	2007	2008	2009	2010	2011
Profit after tax	100	110	110	110	110	110

4.2.16 Whether Commercial Banks are Adopting ICT to Improve their Operations

This section of the study sought to find out whether ICT adoption had led to improvements in the operations of commercial banks.

Table 4.10 Whether Commercial Banks are Adopting ICT to Improve Operations

	Frequency	Percentage
Strongly agree	24	80%
Agree	6	20%
Neither agree or disagree		
Disagree		
Strongly disagree		
Total	30	100

The study indicated that majority of the respondents, 80% strongly agreed that commercial banks were adopting ICT to improve their operations while a further 20% agreed that commercial banks were adopting ICT to remain competitive in the market. From the results it is evident that ICT has become the core of the strategic transformation of operations in commercial banks.

4.2.16 Regression Analysis

$$PROF = (\beta_0 + \beta_1 MB + \beta_2 EMT + \beta_3 IB + \beta_4 EDI) + a$$

Where:

ROE (Return on Equity) is EBIT divided by equity for firm i in time t;

MB adoption of mobile banking technologies

EMT adoption of electronic money transfer

IB adoption of internet banking transaction

EDI adoption electronic data interchange

a is the error term

Table 4.11 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.807 ^a	.651	.581	.64757

Adjusted R squared is coefficient of determination which tell us the variation in the dependent variable due to changes in the independent variable, from the findings in the above table the value of adjusted R squared was 0.581 an indication that there was variation of 58.1% on the profitability of commercial banks dues to changes in adoption of mobile banking technologies, electronic money transfer, internet banking transaction and electronic data interchange at 95% confidence interval. This shows that 58.1% changes in of profitability of commercial banks could be accounted for by adoption of mobile banking technologies, electronic money transfer, internet banking transaction and electronic data interchange. R is the correlation coefficient which shows the relationship

between the study variable, from the findings shown in the table above there was a strong positive relationship between the study variable as shown by 0.807.

Table 4.12 Commercial Bank Coefficient Results

Model	Unstandardized		Standardized	Sig.	
	Coefficients		Coefficients		
	B	Std. Error	Beta		
(Constant)	.083	.358	.231	.819	
Mobile Banking Technologies	.485	.144	.496	3.366	.002
Electronic Money Transfer	.212	.151	.244	1.402	.173
Internet Banking Transaction	.501	.145	.475	3.449	.002
Electronic Data Interchange	.075	.139	.086	.543	.592

$$\text{PROF} = P_0 + P_1\text{MB} + p_2\text{EMT} + p_3\text{IB} + p_4\text{EDI} + a$$

From the data in the above table the established regression equation

$$\text{PROF} = 0.083 + 0.485 \text{ MB} + 0.212 \text{ EMT} + 0.501\text{IB} + 0.075 \text{ EDI}$$

From the above regression equation it was revealed that holding adoption of mobile banking technologies, electronic money transfer, internet banking transaction and electronic data interchange, profitability of commercial banks would stand at 0.087 , a unit increase in mobile banking technologies of commercial banks would lead to increase in profitability by a factors of 0.485, unit increase in adoption of electronic money transfer would lead to increase in profitability by factors of 0.212 , unit increase in adoption of internet banking transaction would lead to increase in profitability by factors of 0.501, further unit increase in adoption of electronic data interchange would lead to increase in profitability by factors of 0.075.

Table 4.13 Commercial Bank Correlation Results

		Profitability	Mobile Banking Technologies	Electronic Money Transfer	Internet Banking Transaction	Electronic Data Interchange
Profitability	Pearson Correlation	1	.619**			
	Sig. (2-Tailed)		.000			
	N	31	31			
Mobile Banking Technologies	Pearson Correlation	.619*	1			
	Sig. (2-Tailed)	.000				
	N	31	31			
Electronic Money Transfer	Pearson Correlation	.494*	.398*	1		
	Sig. (2-Tailed)	.005	.026			
	N	31	31	31		
Internet Banking Transaction	Pearson Correlation	.563*	.151		1	
	Sig. (2-Tailed)	.001	.418	.118		
	N	31	31	31	31	
Electronic Data Interchange	Pearson Correlation	.322	.389*		.420	1
	Sig. (2-Tailed)	.078	.030	.015	.019	

On the correlation of the study variable, the researcher conducted a Pearson moment correlation. From the finding the study found that there was strong correlation coefficient between profitability and adoption of mobile banking technologies as shown by correlation factor of 0.619, this strong relationship was found to be statistically

significant as the significant value was 0.000 which is less than 0.05, the study also found strong positive correlation between profitability and adoption electronic money transfer as shown by correlation coefficient of 0.563, this too was also found to be significant at 0.001 level, association between profitability and electronic money transfer was found to have positive relationship as shown by correlation coefficient of 0.494, this was significant at 0.001 level of significance , profitability and adoption of electronic data interchange were found to have positive correlation with a correlation coefficient of 0.322.

4.3 Summary and Interpretation of the Findings

Through ICT financial-performance has improved over the period the research covered. Use of ATM, electronic funds transfer, smart cards etc has increased. Majority of the respondents agreed that adoption of ICT was very important in the improvement of capital adequacy of commercial banks. Further the respondents rated the importance of adoption of ICT by commercial banks as high. The study also found out that financial innovation has improved the capital adequacy of the bank to great extent; this was revealed by majority of the respondents. On whether commercial banks were adopting ICT, majority of the respondents agreed that their banks were adopting ICT to improve their operations and so as to remain competitive in the market. Moreover, majority of the respondents indicated that their banks had adopted to a great extent innovations such as automated teller machines, smart cards, MICR. electronic funds transfer, electronic data interchange, electronic home banking and electronic office banking in carrying out business activities. This finding of the study supports the findings of the similar studies carried out earlier by the researchers. For instance Simpson, (2002) reveals that electronic banking is motivated largely by the prospects of operating costs minimization and operating revenues maximization. An evaluation of online banking in developed and emerging markets reveals that in developed substitute for physical branches for delivering banking services

Majority of the respondents indicated that their banks had adopted to a great extent innovations such as automated teller machines, smart cards, MICR, electronic funds transfer, electronic data interchange among other components of ICT. This finding of the study appears to validate the findings of the earlier studies. Egesa (2006) studied Customer Adoption of Tele-banking Technology in the Kenyan banks and found that customers increasingly extend their use of tele-banking as their experience grows with the system and that education played a vital role in the adoption and usage of tele-banking technology.

Other studies in agreement of these findings are those done by Young. In their research, De Young et al (2007) analyzed the effect of e-banking on the performance of banks by studying US community banks markets and compared the performance of virtual click and mortar banks with brick and mortar banks. Their findings concluded that e-banking improved the profitability of banks hence increasing their revenues. Also, E-banking is largely driven by the factors of minimizing the operating costs and maximizing operating profit, suggests Agboola (2002). According to Dabholka (2002), the e-banking adoption factors are divided into two categories: Factors relating to the infrastructure and accessing technology, factors that are related to retail banking factors. The prior factors include skills on the part of consumers in using internet and other related technologies, attitudes towards technologies, internet penetration rate, privacy and security concerns. Later involves factors like banking culture, e-banking culture, trust in banking institutions and internet banking push. However, lack of PC and internet penetrations serve as barriers for development of e-banking. Also, in their study conducted in Turkish retail banking sector. Hawkins (2001) concluded that e-banking decreases operational costs and it amplifies customers' satisfaction and retention hence increasing the financial performance of the banks

The study set out to find the impact of ICT on profitability of the commercial banks and in deed the finding was positive affirming that relationship. This supports other studies

which have been carried out in this area. For instance Kozak (2005) investigates the influence of the evolution in Information Technology on the profit and cost effectiveness of the banking zone during the period of 1992-2003. The study indicates optimistic relationship among the executed Information Technology and together productivity and cost savings. Brynjolfsson and Hitt (2000) indicates that "Information Technology contribute significantly to firm level output." They determine that Information Technology capital contributes an 81% marginal increase in output, whereas non Information Technology capital contributes 6%. Likewise they illustrate that Information System professionals are more than twice as productive as non- Information System professionals.

The study also sought to find out whether the adoption of ICT had improved the liquidity of commercial banks in Kenya. Liquidity for a bank means the ability to meet its financial obligations as they come due. Banks lend finances to invest in relatively illiquid assets, but it funds its loans with mostly short term liabilities. Thus one of the main challenges to a bank is ensuring its own liquidity under all reasonable conditions. From the finding, majority of the respondents agreed that adoption of ICT had improved the liquidity of their organizations.

The study also sought to determine how the adoption of ICT contributes to improvement of asset quality in commercial banks in Kenya. From the findings, majority of the respondents revealed that ICT had positively contributed to improvement of asset quality of the commercial banks. This corroborates a number of similar studies carried out earlier. For instance Haq (2005) states that banks exist because of their ability to achieve economies of scale in minimizing asymmetry of information between savers and borrowers and hence improving the asset quality. The unit costs of Internet banking fall more rapidly than those of traditional banks as output increases as a result of balance sheet growth. In this context, De Young et al (2007) refer to the Internet banking as a "process of innovation that functions mainly as a substitute for physical branches for delivering banking services"

Further, the study sought to find out whether ICT had improved the earnings in the commercial banks. From the study majority of the respondents agreed that ICT had improved the earnings in their organization. It was quiet evident that majority of the commercial banks had adopted ICT in their operations. ICT had let to improved financial performance of the banks. The reported earnings and growth in financial performance over the period can be attributed to ICT. This finding of the study appears to corroborate some of the earlier studies carried out. For instance, Carlson et al (2000) and Furst et al (2002) conducted an intensive research whether there is a positive relationship that exists between offering electronic banking and banks profitability. Furst et al (2002), reveals that federally chartered US banks had higher Return on Equity (ROE) by using the conventional business model, ICT was one of the major factors that affect banks profitability within the period under study and they also observe that more profitable banks adopt ICT after 1998 but yet they are not the first movers. The finding however conflict with some studies such as Eglund et al (1998), who conducted a study and found no evidence of major differences in performance of electronic banking in the US subject to two caveats: This result may not be the case for all the banks and secondly, such results are open to change over time as banks become more severe in the use of innovation.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

The purpose of the study was to establish the impact of ICT adoption on the financial performance of commercial banks in Kenya. The study was carried out using a questionnaire that was administered to senior managers of commercial banks.

The banking industry which is the back bone of every economy is confronted with various challenges such as globalization, deregulation, competition, significant high cost of installing ICT and maintenance. The usage of ICT can lead to lower costs, but the effect on profitability remains inconclusive, owing to the possibility of ICT effects that arise as a result of consistence high demand of skilled work force, issues of increasing demand to meet customer's expectation for customer service delivery, trustworthiness of the information system and competition in financial.

The study found out that the adoption of ICT had improved the capital adequacy of the banks studied and further improved their operations, not only increased their market coverage but also remained competitive in the market. The study also found out that ICT had improved the liquidity of the commercial banks. ICT has also improved the asset quality in commercial banks in Kenya, long term financing that is required for creating long lived assets is also addressed through ICT. The study also found out that ICT improved the earnings in commercial banks. Majority of the commercial banks studied revealed that there was growth of sales of 10% from the year 2006 to 2011. The reported earnings and growth in financial performance over the period covered can be attributed partly to ICT. We can therefore conclude that the adoption of ICT can improve earnings in commercial banks.

In general, the study shows the realization of the benefits in relation to ICT could be the reason why adoption of ICT by commercial banks in Kenya has been very high in recent past. It is quite evident from our study that enhancing ICT in the banking industry is a must in a rapidly changing market place, as the ICT revolution has set the stage for

exceptional increase in financial activity across the globe.

5.2 Conclusions

From the study, it can be concluded that there is a positive impact of ICT on financial performance of commercial banks in Kenya. Competition among banks in Kenya has led to continuous innovation in ICT products. The improved performance was as a result of reduced costs of financial transactions that can be attributed to ICT. Majority of commercial banks in Kenya have invested their resources in new products and technology innovations such as automated teller machines, smart cards, MICR, electronic funds transfer, electronic data interchange, electronic home banking and electronic office banking. These aspects of ICT have helped the banks in carrying out business activities more effectively and efficiently. The importance of ICT by commercial banks was rated high. Adoption of ICT by commercial banks also improved firms' performance.

ICT had not improved the capital adequacy of the organization to a great extent but commercial banks are adopting ICT so as to improve their operations and their market coverage and so as to remain competitive in the market. The study established that adoption of ICT was very important in the improvement of capital adequacy of commercial banks. Adoption of ICT improved the liquidity of commercial banks. Adoption of ICT improved the liquidity of commercial banks. Liquidity is the ability of an asset to be converted into cash quickly and without any price discount or without affecting the assets price. Through ICT banks are able to deepen liquidity in existing markets, for example by reducing excessive reliance on a narrow base of depositors for funding. Moreover, ICT contributes to the improvement of asset quality and the level of performance realized in earnings after tax has increased as observed by the trend in terms of growth for the last five years since the banks adopted ICT.

To successfully cope with the challenge of the ICT, the banking sector must understand the nature of the changes that revolves around them, changes in terms of ICT, Innovation and Demography. Without this understanding, attempts to migrate to

ICT may be doomed to failure. Today, banks that are well equipped with a good grasp of the electronic banking phenomenon will be more able to make informed decisions on how to transform ICT and to exploit the opportunity in electronic banking. In today's competitive market, establishing core capabilities can help the banking industry reorganize their product and customer service delivery, so as to sustain competitive advantages and to achieve congruence whilst shifting from the conventional banking to electronic banking and hence enhance the financial performance of the institutions.

5.3 Policy Recommendations

Based on the findings and conclusions of the study, the following recommendations have been suggested in relation to ICT. There is need for commercial banks to adopt ICT since this will provide the benefits of constant access to certain core services and reducing the need for one to go to the banking hall. ICT adoption by the banks has prompted agreements to share systems through between banks and the development of cash points being installed in non-branch locations such as supermarkets; this means that a proportion of a particular banks customer base may no longer use the bank's branch network at all. Continuous ICT innovation will lead to increased customer satisfaction due to more choices created of transacting business.

Like many businesses, turnover in banks is high but liquidity is not necessarily high. Hence there is need to adopt financial innovations in ICT to improve liquidity in banks. The study had shown that commercial banks that had adopted ICT had improved their liquidity.

Adoption of ICT enables operations of commercial banks to be more efficient through making financial services more available and reducing their costs. This was mostly achieved by technological innovations such as ATM, smart cards, MICR, electronic fund transfer, electronic home banking and electronic office banking. Financial products that are delivered through ICT are user friendly and promote banks revenues, increased

profits, increase liquidity and lower the risks related to the usage of financial services. The research therefore recommends that the banks seeking to improve financial performance should embrace ICT.

Some financial innovations decrease risk and volatility associated with globalizing markets. With greater globalization, firms, investors and governments are exposed to new risks such as exchange, interest rate and political risks which ICT seek to manage. The rapid proliferation and diffusion of ICT in the Banking Industry of Kenya should provide a platform to use modern technologies to develop operational efficiency and quality of service to attract and retain customers and in the process enhance the financial performance of the commercial banks. Banks in Kenya should proactively monitor customers preferences with regard to technological innovations such as ATMs and try to implement these preferences in their features in order to enhance their functionalities leading to enhanced financial performance.

5.4 Limitations of the Study

The target population in this study consisted of commercial banks that were fully registered with Central Bank of Kenya; this left out the larger population of financial institutions such as SACCOs, Insurance companies who have also established adopted ICT in their operations.

Some of the respondents were suspicious about the study and left gaps on the questionnaires for fear that the confidentiality of certain information about their banks may be exposed to competitors and other parties. This fear was in spite of the respondents not being required to necessarily disclose the identities of their banks. In addition each questionnaire was attached with an assurance letter to the respondents that their responses would be treated with ultimate confidentiality and solely for academic purpose. This deprived the study some necessary information.

Another limitation of the study was that, the sample of the study consisted mostly of highly educated managers; it is likely that the study restricted itself only to certain group with similar demographic characteristics. The sample size used in the study could therefore be considered to be not representative enough.

The study also used drop pick later method of the questionnaires in data collection; this is suspected to be the reason for non-response in some questionnaires as compared to the case where the researcher personally administers the questionnaire and takes the respondents through the process. Personal administration of questionnaires would ensure data collected is adequate.

5.5 Suggestions for Further Studies

The researcher recommends the following areas for further studies; the researcher suggests that for effective conclusive study on relationship between ICT and financial performance, a replica study be carried out in another industry for example the insurance sectors for comparison of results. Probably a case study/in depth approach would uncover more.

Questionnaires targeting finance managers and ICT managers were used to collect data in this study. The researcher suggests that in future studies be conducted using interview guide and involving the respondents into discussions. This would help the researcher direct the conversation toward topics and issues on ICT adopted and the challenges faced. The sample size should also be increased to cover more management staff. Certainly acknowledging that financial institutions are currently adopting ICT in their business operations, the researcher suggests that a further study be carried to establish whether adoption of ICT increases the demand for product or services from commercial banks.

REFERENCES

- Abernathy, W. J. Utterback, J. M. (2005), *Innovation and the Evolution of Technology in the firm*. Harvard University Press, Cambridge, M.A.
- Adeoti, J.O (2005) "*Information Technology Investment in Nigerian Manufacturing Industry: The Progress So Far*", Selected Papers for the 2004 Annual Conference, Ibadan: Nigerian Economic Society, 213-244
- Agarwal,R.&Prasad, J.(1997),*The role of innovation characteristics and perceived voluntariness in the acceptance of information technologies*. Decision Sciences, Summer 1997,vol 28,no 3,pp. 557-582.
- Agboola, A.A (2002), *Information Technology, Bank Automation, and Attitude of Workers in Nigerian Banks*, Journal of Social Sciences, Kamla-Raj Enterprises, Gali Bari Paharwali, India.
- Ayadi A. (2003), *Technological and organizational preconditions to Internet banking implementation: case of Tunisia Bank*. Journal of Internet Banking and Commerce, 11(11): 1-15.
- Ayres, R. U (2008), "Technology: The Wealth of Nations," *Technological Forecasting and Social Change*, vol. 33 No. 2, pp. 189 - 201.
- Balachandher Krishnan Guru, Santha Vaithilingam, Northazlin Ismail, and Rajendra Prasad, (2001) "*Electronic Banking in Malaysia*", A Note on Evolution of Services and Consumer Reactions
- Bank of Uganda (2002), Quarterly Economic Report: Commercial Banking Activities. June 2002 vol.02/2002.

- Battacherjee, W. (2000), "The deployment of temporary production workers in assembly operations: a case study of the hidden costs of learning and forgetting", *Journal of Operations Management*, Vol. 21 pp.689-707.
- Berger A. N. (2003). 'The economic effects of technological progress: evidence from the banking industry'. *Journal of Money, Credit, Banking*, 35 (2): 141-176.
- Branchaeau, J.C. & Wetherbe, J.C. 1990. The adoption of spreadsheet software: testing Innovation Diffusion Theory in the context of end user computing. *Information systems Research*, vol 1 no. 2 pp 115-143
- Brynjolfsson E. and Hitt L.M. (2000). 'Beyond computation: information technology, organizational transformation and business performance'. *Journal of Economic Perspectives*, 14(4): 23-48.
- Carlson J. et al. (2000), *Internet Banking: Markets Developments and Issues. Economic and Policy Analysis, Working Papers, 2000-9*, Office of the Comptroller of the Currency.
- Central Bank of Kenya <http://www.centralbank.go.ke> accessed on 20th January 2012
- Chorafas, Dimitris N. (2000). "Electronic Funds Transfer", Butterworths, London, UK. 1st edn.
- Claessens, S., Glaessner, T. and Klingebiel, D. (2001), *E-finance Emerging Markets: Is Leapfrogging Possible?* Financial Sector, Discussion Paper, The World Bank, Vol. 7.
- Curtin D.P et al, (1998), *Information Technology*, 1st Edition MC Graw-Hill Companies Inc., USA.

- Dabholkar, P. and R. Bagozzi,(2002). An attitudinal model of technology-based self service: *Moderating effects of consumer's traits and situational factors*. *J. Acad. Market. ScL*, 30: 184-201
- Davenport, T. H.; Prusak, L. (1998) Telecommuting innovation and organization: a contingency theory of labor process change". *Social Science Quarterly*, Vol. 74 No.2, pp.367-85.
- Davis, F. D (1989) Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, Minneapolis (MN), v. 13, n.3, p.319-339,
- Davis, F. D.; Bagozzi, R. P.; Warshaw, P. R (1989). User acceptance of computer technology: a comparison of two theoretical models. *Management Science*, Ann Arbor (MI), v.35, n.8, p.982-1003,
- Daniel. E . M .and H.M. Wilson, (2003)"*The Role of Dynamic Capabilities in E-Business Transformation*," *European Journal of Information Systems*, Vol. 12: 82-296,
- DeYoung, R. (2005), *The Performance Internet- based Business Models: Evidence from the Banking Industry*. *Journal of Business*, Vol. 78, No. 3, pp. 893-947.
- DeYoung, Robert, (2007/ "*The Financial Performance of Pure Play Internet Banks*", *Economic Perspectives*, Federal Reserve Bank of Chicago,25(First Quarter),60-75.
- DeYoung, Robert, (2001 a/ "*The Financial Performance of Pure Play Internet Banks*", *Economic Perspectives*, Federal Reserve Bank of Chicago,25(First Quarter),60-75.

- DeYoung, Robert, (2001b). *"The Financial Performance of Pure Play Internet Banks"*, Economic Perspectives, Federal Reserve Bank of Chicago,25(First Quarter),60-75.
- Dillon, A.; Morris, M (1996). User acceptance of new information technology: theories and models. Annual Review of Information Science and Technology, Medford (NJ), v.31,p.3-32.
- Economides N. and Salop, S (1992), *Competition and integration among complements, and netM'ork market structure*. The Journal of Industrial Economics, XL (1): 105-123.
- Egesa, A. (2006). *Customer Adoption of Tele-banking Technology in Kenyan Banks*. Unpublished MBA project University of Nairobi
- Egland, K, Furst K., Nolle D, and Robertson D.(1998), *Banking Over the Internet*, Office of the Comptroller of the Currency Quarterly Journal, Vol. 17, No. 4.
- Essinger, James, (1999) *"The Virtual Banking Revolution"*, The Customer, The Bank and the future. 1st ed., International Thomson Business Press, London, UK.
- FarrellJ and Saloner G. (1985), *Standardization, compatibility and innovation*. Rand Journal of Economics, 16 (1): 70-83.
- Fishbein, M. & Ajezen, I (1979). Belief, Attitude, Intention and Behaviour: *An Introduction to Theory and Research Reading, MA: Addison. Wesley*.
- Fishbein, M., Ajzen, F. (1975), "Case study: the synergism of telecommuting and office automation", *Sloan Management Review*, Vol. 41 No.2, pp.85-96.

- Furst, K., Lang, W. and Nolle, D (2002), *Internet Banking, Journal of Financial Services Research*, Vol. 22, pp. 95-117.
- Gerstenfield, A. Woltzel L. (2007), "Strategies for Innovation in Developing Countries," *Sloan Management Review*, Fall, pp. 57 - 68.
- Haq, M. F. (2005), *The Role of Information System in Islamic Banking-*. An Ethnographic Study, University of London
- Hassan, M.K and Bashir, A. H. M. (2003), "*Determinants of Islamic Banking Profitability*", Paper presented at the Economic Research Forum (ERF) 10th Annual Conference, Marrakesh-Morocco, 16-18 December
- Hawkins, J, (2001).The banking industry in the emerging market economies: Competition, consolidation and systemic stability: *Journal of Finance*, 1 (November), 277-296
- Hernando, I and Nieto, M. J. (2007), *Is the Internet Delivery Channel changing Banks' Performance?* The Case of Spanish Banks, *Journal of Banking & Finance*.
- Inyaga, A. (2002). *The utilization of information and communication technology in the management of University of Nairobi*. Unpublished MBA project University of Nairobi
- Kamotho A. D. (2008), *Mobile Phone Banking: Usage Experiences in Kenya*. Unpublished MBA project University of Nairobi
- Kihumba W. (2008), *Determinants of Financial Innovations and its effects on banks performance in Kenya*. Unpublished MBA project University of Nairobi

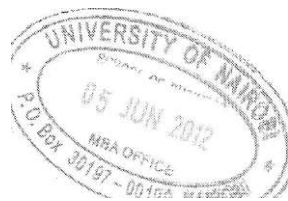
- Kothari C.R (1990). *Research Methodology method & Techniques* - Second. Edition
- Kozak S. 2005. 'The role of information technology in the profit and cost efficiency improvements of the banking sector'. *Journal of Academy of Business and Economics*, February 2005.
- Laudon, D.P. and Laudon, J.P. (1991): *Business Information System: A Problem Solving Approach*, New York, HBJ, College Publishers.
- Lee, Y. et al (2003). *The technology acceptance model: past, present, and future*. Communications of the Association for Information Systems, Atlanta (GA), v. 12, n.50, p.752-780. 2003.
- Maina (2010), *A survey on impact of ICT on Business Value Creation in Kenya Banking Sector*. Unpublished MBA project, University of Nairobi.
- Moore, G.C & Benbasat, I.(1991). Development of an instrument to measure perceptions of adopting an information technology innovation. *Information systems Research*, vol 6, no 2 pp. 144-176
- Muhasa, C. (2005). *Technological innovation, employee attitudes, job design use adoption and perceived organization performance in Kenya*. Unpublished MBA project University of Nairobi.
- Mugenda O and Mugenda A, 2003, *Research Methods Quantitative and Qualitative Approaches*, Nairobi acts Press.
- Mwangi M. K. (2007) *Factors Influencing Financial Innovations in Kenya's Securities Market*: Unpublished MBA project, University of Nairobi.

- Pack, H; Westphal, L. E. (2006), "Industrial Strategy and Technological Change: Theory versus Reality," *Journal of Development Economics*, vol. 22.
- Rogers, E.M (1983), *Diffusion of Innovations*, 3rd edition. New York, NY: The Free Press
- Rose, Peter S. (1999), *Commercial Banking Management*, 40 ed., Irwin/McGraw-Hill, Boston, USA.
- Saunders, M, Lewis, P.and Thomhill, A. (2007), *Research Methods for business Students*.4th ed.London: Prentice Hall.
- Saythe, M. (2005), *The Impact of Internet Banking on Performance and Risk Profile Evidence from Australian Credit Unions*. *Journal of Banking Regulation*, Vol. 6, pp. 163-174.
- Siam, A. Z. (2006). *Role of the Electronic Banking Services on the Profits of Jordanian Banks*. *American Journal of Applied Sciences*, 1999-2004.
- Simpson, J. (2002), *The Impact of the Internet in Banking Observations and Evidence from Developed and Emerging Markets Telematics and Informatics*, Vol.19, No. 4, pp. 315-330.
- Sindi, B. (1997), "Information aspects of new organizational designs: exploring the non-traditional organization", *Journal of the American Society for Information Science*, Vol. 49 No. 13, pp. 1224-44.
- Sharelson, R. J. (1981). *Statistical reasoning for the behavioral science*& Boston: *Financial Times Prentice Hall*.

- Solow. R. (1987), *Technical Change and the Aggregate Production Function*, *Review of Economics and Statistics*, 39: 312-320.
- Shu W. and Strassmann P.A. (2005). 'Does information technology provide banks with profit?' *Information & Management Journal*, 42: 781-787
- Sullivan, R. J. (2000), *How has the adoption of Internet Banking affected Performance and Risk at Banks? A look at Internet Banking in the 10th Federal Reserve District*, Federal Reserve Bank of Kansas City Financial Industry Perspective, pp. 1-16.
- Taylor, S. & Todd, P. (1995) (b). *Understanding information technology usage: a test of competing models*. *Information Systems Research*, June 1995, vol.6 no 2, pp 144-176.
- Turban E et al., (2008) *Information Technology for Management: Transforming Organizations in the Digital Economy*, 6th edition.
- Venkatesh, V., Davis, F. D (2000). *A theoretical extension of the technology acceptance model: four longitudinal field studies*. *Management Science*, Ann Arbor (MI), v.46, n.2, p. 186-204,
- Whitten J. L., Bentley L.D. and Dittman K.C. (2004.) *System Analysis and Design Methods*, 'McGraw-Hill, New York.

APPENDICES

APPENDIX 1: LETTER OF INTRODUCTION



APPENDIX 2: LISTED COMMERCIAL BANKS IN KENYA

1. African Banking Corporation
2. Bank of Africa
3. Bank of Baroda
4. Bank of India
5. Barclays Bank of Kenya
6. CFC Bank
7. Charterhouse Bank
8. Chase Bank
9. Citibank
10. City Finance Bank
11. Co-operative Bank of Kenya
12. Commercial Bank of Africa
13. Consolidated Bank
14. Daima Bank (under Statutory)
15. Development Bank of Kenya
16. Diamond Trust Bank
17. Dubai bank
18. EABS Bank
19. Euro Bank
20. Equitorial Commercial Bank
21. Equity Bank
22. Family Bank
23. Fidelity Commercial Bank
24. Fina Bank
25. Giro commercial Bank
26. Gurdian Bank
27. Habib AG Zurich
28. Habib Bank
29. Imperial Bank

N

30. Investment and Mortgages bank
31. Jamii Bora Bank
32. K Rep bank
33. Kenya Commercial Bank
34. Middle East Bank
36. National Bank of Kenya
37. National Industrial Credit Bank
38. Oriental Commercial Bank
39. Paramount Universal bank
40. Prime Bank
41. Southern Credit bank
42. Stanbic bank
43. Standard Chartered bank
44. Trans-National Bank
45. Victoria Commercial Bank
46. Eco Bank

Source :(CBK, 2012)

APPENDIX 3: QUESTIONNAIRE

SECTION A: BACKGROUND INFORMATION OF THE RESPONDENTS

1. What is your total experience in the banking industry (please tick inside the relevant brackets).

1 year { }

2 - 5 years { }

5 - 10 years { }

Over 10 years { }

2. How long have you worked with your current bank?

1 year { }

2 - 5 years { }

5 - 10 years { }

Over 10 years { }

3. Kindly indicate your job designation.

Finance manager { }

Business manager { }

IT manager { }

Others please specify { }

4. Please indicate the level of education.

Diploma { }

First Degree { }

Advanced Diploma { }

Masters Degree { }

SECTION B: ICT AND FINANCIAL PERFORMANCE

5. To what extent does this bank make use of the following technological innovations in its operations? Use a scale of 1 to 5 where 1 is to a very great extent and 5 is to no extent.

Technological innovation	1	2	3	4	5
Mobile banking technologies					
Electronic money transfer					
Internet banking transactions					
Electronic Data Interchange					
ATM deposits and withdrawals					
Smart cards					
Other (specify)					

6. Would you agree that the adoption of ICT is very important in the improvement of capital adequacy of commercial banks?

Strongly Agree ()

Agree ()

Neither Agree nor Disagree ()

Disagree ()

Strongly Disagree ()

Please give reasons for your answer

7. How would you rate the importance of financial innovations in the improvement of the capital adequacy in the organization?

Very high ()

High()

Moderate ()

Low ()

Neglible ()

Please explain

8. To what extent has ICT improved the capital adequacy of the bank?

Very great extent ()

Great extent ()

Moderate extent ()

Low Extent ()

No extent ()

Please explain....

9. Would you agree that the adoption of ICT has led to an improvement in the liquidity of commercial banks?

Strongly Agree ()

Agree ()

Neither Agree nor Disagree ()

Disagree ()

Strongly Disagree ()

Please give reasons for your answer

10. Would you agree that the adoption of ICT had contributed to the improvement of asset quality of commercial banks?

Strongly Agree ()

Agree ()

Neither Agree nor Disagree ()

Disagree ()

Strongly Disagree ()

Please give reasons for your answer

11. Would you agree that the adoption of ICT is very important in the improvement of earnings of commercial banks?

Strongly Agree ()

Agree ()

Neither Agree nor Disagree ()

Disagree ()

Strongly Disagree ()

Please give reasons for your answer

12. Do you agree that commercial banks are adopting ICT to improve their operations?

Strongly Agree ()

Agree ()

Neither Agree nor Disagree ()

Disagree ()

Strongly Disagree ()

Please give reasons for your answer