EFFECTS OF INFORMATION COMMUNICATION TECHNOLOGY ON FINANCIAL PERFORMANCE OF COMMERCIAL BANKS IN KENYA

BY

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A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTERS OF BUSINESS ADMINISTRATION, SCHOOL OF BUSINESS, UNIVERSITY OF NAIROBI

DECEMBER 2017

DECLARATION

STUDENT'S DECLARATION

This research project is my original work and has not been presented for a degree at any other university.

Signature……………………………………… Date ……………………...

KARIUKI EPHANTUS MWANGI

D61/80822/2015

This research project has been submitted for examination with my approval as the;

Signature ……………………………………… Date ……………………...

DR. MIRIE MWANGI

ACKNOWLEDGEMENT

I will begin by acknowledging the almighty God who has given me good health, finances and knowledge as I was undertaking this research proposal. I bless His name for He has been good to me. I would also special appreciation and gratitude to my lecturers especially Dr. Mirie Mwangi for passing the necessary knowledge required in the course of doing this project. Also, let me pass special thanks to my classmate Martin Muthuiya and Philemon Omondi for always being generous whenever I called them for assistant.

DEDICATION

I dedicate this research project to my wife Regina Mwangi and my son Godfrey Kariuki for the moral support given in the course of my studies. They have been installment and patient within the course of my studies. They have also given me inspiration and motivation at every stage carrying out this. I would also want to thank my wife for her understanding as I was pursuing my research project.

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LIST OF ABBREVIATION

ATM	**:**	Automated teller machine
CBK	**:**	Central bank of Kenya
DOI	**:**	Diffusion of Innovation
NIM	**:**	Net Interest Margin
ICT	**:**	Information communication technology
ROE	**:**	Return on equity
ROA	**:**	Return on assets
TAM	**:**	Technology acceptance mode

ABSTRACT

This research project had the purpose of finding the effect of information communication technology on financial performance of commercial banks in Kenya. Information and communication technology is important to the banking industry in Kenya. The banking sector is vital for the growth of economy of a nation. Qualitative research design was employed in this study. The population of study was the 43 registered commercial banks in Kenya. Data collection sheet was used as the instrument of data collection. The information was gathered from the audited financial report which were readily available at the Central Bank of Kenya. SPPS and excel were used to analyze the data collected. The research discovered that information communication technology has improved the financial performance of commercial banks in Kenya. As a results the market share has been increased plus it has assisted the commercial banks to remain competitive. Information communication technology also assists to improve the liquidity of commercial which lowers dependability of depositors therefor improving on earnings and return. This helps improve of efficiency and profitability of the commercial banks especially in the emerging banks. The study discovered there is need to invest more on information communication so as to increase the commercial banks financial performance. The fast pace growth and development of information communication technology in the Kenya banking sector has resulted into improvement in efficiency in operation and also in service delivery. Commercial banks have become competitive by enhancing staff training and growth as well as research and development in technology. Thus the study concludes that among the ICT employed by commercial banks, mobile banking had the most positive influence on the financial performance.Based on the study findings, the study recommend that commercial banks should reduce investment in ATMs and internet banking as this was found to have negative influence on financial performance. In this case therefore the researcher recommends that commercial banks should keep investing and also using the mobile banking in their daily operations. This is due to the fact that the people who owns mobile phones are increasing day by day.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Banking industry has remained to be among the vital sectors of the financial institutions in most countries (San & Heng, 2013). The financial sector of an economy has a significant contribution towards mobilizing savings and using the mobilized savings in financing the most productive sectors of economic (Alkhazaleh & Almsafir, 2014). As such, commercial banks are important to the financial segment of the economy especially the growing economies ones where capital markets are not well developed and strong.

In economies where the capital markets are still developing, banking institutions serve as a vital source of finances for enterprises (Ntow & Laryea, 2012). Therefore, good performance of the bank is usually measured as per its profitability levels and has been essential to shareholders, customers as well as for banks continued survival and expansion (Nkegbe & Yazidu, 2015).The Kenyan banking industry is vital to Kenyan economy and plays a crucial financial intermediary function. In Kenya banks play a crucial role in national growth and such roles are growing day-by-day (Wanjiru & Njeru, 2014). The Kenyan banking sector plays the function of financial intermediation between borrowers and savers that entails the mobilization of capital from individuals with surplus cash and channeling the funds to the deficit economic units (Kimutai & Jagongo, 2013).

Ongori and Migiro (2010) argue that ICT has resulted into a revolution on the banks performance and on customer service. To keep up with the dynamics of the external environment, banks are investing in ICT as a way of moving to a knowledge-based society which is a key driver towards achieving economic growth of a country (San-

Jose, Ituralde, and Maseda, 2009) According to Harold and Jeff (1995) institutions that offer financial should change their old policies in order for them to be relevant today and tomorrow. They explain that the most critical limitation in the banking industry in modern time is failure of management to include ICT in their strategic plan.

Woherem (2000) explains that banks that change their payment method and embraces technology have the likelihood to grow and beat competition. He advices banks to look into customer service delivery. Due to ICT banks in Nigeria has experienced much growth. To this extent therefore commercial banks in Nigeria have experienced much growth associated with ICT development. For survival, market share, maintenance and global relevance there is need for exploration of the pros of ICT. According to Laukkanen & Pasanen (2007), commercial banks and financial institutions that previously were dependent on on physical branches are adopting mobile baking as a way of enhancing branchless network. In this case therefore banking operating cost has reduced. ICT is therefore the answer to giving clients flexible banking through ATM, mobile and internet banking.

1.1.1 Information Communication Technology

ICT can be used to refer to a process of automation of controls, process output of information by means of computer, software's, ATMS, credit cards and other devices and equipments (Khalifa 2000). According to Irechukwu (2000) there has been a revolution in banking. Some of the services that have been revolutionalised include transaction processing, account opening, and recording among others. ICT has facilitated self-services including account opening on online platform. Information communication system also informs customers on receipt of cheque books, debit cards and credit cards. The communication technology usually concentrate with tangible devices and also software's that connects computer hardware and aid in transfer of data and information from one area to another (Laudon and Laudon; 2001).

In financial sector, ICT is viewed as a way of making known of new technologies, markets, financial tools and markets which enables accessibility of information and ways of transacting (Solans, 2003). Lerner (2009) explains that ICT is not only important to finance industry but also to other business. According to Akamavi (2005) ICT recently has resulted in some changes in financial markets and institutions. Some of these changes include fewer regulations, increased cost of developing technological products and competition. Some of the ICT used in commercial banks of Kenya include;

The term an automatic teller machine is used to a computer device which has record-keeping system and cash unit which allows clients to use a card and a personal identification number to gain access to bank services twenty four hours a day. The ATM offers varies services to customers which include cash withdrawal, cash deposit, cash advance, payment of bills, mini-statement and others. Most of the ATMs are located in towns, malls outside the banks in institution, airports and so on. Banks usually use the ATMs to ensure that they have a competitive advantage (Rose 1999).

Internet banking can be defined as the usage of telecommunication and internet networks to offer products and services which have been value added to a given customer. In some instances online banking allows aggregation of accounts to allow monitoring of accounts in one time by customers regardless of the fact that they are on their own bank or other financial institutions. Internet has changed the financial information. It connects a bank's head office to its various branches (Miklasewska, 1998).

Mobile banking; it is also called m-banking. It refers to the process of performing banking transactions by means of communication device such as phones (Anyasi & Otubu, 2009). The extent of services offered include trading in stock market, access to data and information, operate accounts and so on. Leow (1999) states that there are numerous advantages of mobile banking to both the bank and the customers, the cost of operating mobile banking is minimal as compared to the cost of installing ATMs. Mobile banking also ensures convenience, saves time as well as cutting cost.

1.1.2 Financial Performance

Financial performance can be used to refer to the results of a firm over a specific period of time and is usually expressed in terms of the overall profits or losses incurred over the specific period under evaluation (Bodie, Kane and Marcus, 2005). The Profit is the major objective of commercial banks. The plans should be designed and activities performed in a way that is meant to realize this grand goal. Without this grand goal most organization will not survive.

Return on Equity (ROE); refers to a ratio that measures the amount of return a firm generated as compared to the shareholder equity. ROE shows what investors get out of their investment. A firm with greater ROE has the ability to generate income from within than that with lower ROE. In this case therefore, the higher return on equity a firm has the more its ability to generate profit generation Khrawish (2011).

Return on Asset; it is a ratio which is used to measure net profit to total asset (Khrawish, 2011). It reflects the rate at which the bank is able to earn revenue using fixed assets. In this case therefore return on assets shows how a firm is efficient in using its fixed assests to generate income. The ratio also indicates management ability to generate income using the available resources (Khrawish, 2011).

Net Interest Margin (NIM); A higher NIM margin shows a better returns and stability of a bank. In this case therefore it is one of the vital measures of ability to be profitable. Despite the above when net interest margin is higher it could mean that there is riskier leading practices that could result into a lot of loan loss Khrawish (2011). When there is a lot of loan loss the impact is that the profitability of an organization is reduced.

1.1.3 Information Communication Technologies and Financial Performance

Barney (1991) in his resource based theory argues that when an organization is in possession of strategic resources it is able to compete well as compared to its competitors. These competitive advantages usually assists a firm earn more profits and hence improve financial performance. The growth of an organization is achieved by a strategic resource. In this case there ICT can be counted as one of the strategic resource that commercial banks need to grow and compete effectively.

According to Davis (1989) in his technology acceptance theory he argues pervasiveness is the extent of believing that using a ICT will result to improved performance. In this case therefore acceptance of a given technology has bipolar results. The acceptance of a given technology by the user will definitely result to efficiency in carrying out a given task and hence an increase in productivity and performance.

Rogers (1995) in his diffusion of innovation theory argues that when an innovation is superior to its predecessor it is said to have a relative advantage. With realization of relative advantage of a given technology by a user, they will tend to accept and adopt it. When ICT is adopted pros such as convenience, easy access and affordability are reported by customers. To this extent therefore customer are likely to adopt an ICT when they experience its advantages (Roberts and Amit, 2003). This as a result will lead to improvement of financial performance.

One of the key improvements arising from the use of ICT in commercial banks is the reduction of overhead costs. The costs associated with the maintenance of physical branches, marketing and labor can reduced to a large extent through adoption of ICT (Hernado and Nieto, 2007). To this extent therefore ICT helps in ensuring efficiency in the usage of resources. When an organization uses its resources efficiently, it is able to minimize cost and hence increase profitability and financial performance as a whole.

1.1.4 Commercial Banks in Kenya

There are forty three licensed commercial banks in Kenya of which in three banks government holds majority shares, 40 are privately owned, 15 were foreign-owned and 25 were locally owned. Among the 43 banks in Kenya two of the banks (chase bank and imperial bank) are under liquidation due to liquidity problems and unethical bank practices (CBK annual report, 2016 report). Banks must ensure that there is sufficient money to be borrowed by the investors.

Majority of banks are investing in ICT. The fast growth of ICT has made some of the functions of the banks more efficient and cheaper; this has increased deposits, sales and performance of these firms. Most commercial banks in the developing economies are adopting internet banking. Usage of ICT has brought changes that are resulted to reduction in cost, efficiency and convenience to clients (Muyoka, 2014). The reduction in cost has resulted to many commercial banks growth in profitability and hence sound financial performance.

The increased demand for information communication technology in banks has attracted attention in the banking sector in Kenya. Banks have resulted into deployment of information communication and technology banking innovation such as ATM, internet banking, mobile banking, and others (Juma, 2012). To this extent therefor every bank is working to improve its information communication technology.

1.2 Research Problem

Lately, there have been a tremendous increase in the use of information communication and technology more importantly in the banking sector. Information communication technology usually has various products such as security investment, internet banking and electronic payments (Berger 2003). The financial institutions can improve earnings by delivering high quality services to clients. According to recent research ICT has shown promising effect on bank performance. Usually, operational expenses have been cut down by the use of Information technology thus improvement in performance. It has been noted that through the use of ICT services have been standardized, self-services transaction have been made possible by use of internet and mobile banking. In this regard therefore information communication technology will assist banks concentrate on important transactions like investment banking and personal trust services.

In spite of numerous advantage of ICT, debate on how it increases financial performance need to be evaluated. Berger (2003) discovered that ICT adoption can result into lowering of operating cost as a result quality of services in improved. This research concentrated on the link between ICT and cost reduction, productivity and improved quality of services. The research found out that ICT usage enables reduction in cost, increased productivity and better service delivery.

Solow (1987) noted that information communication technology can affect performance negatively and therefor reduce on productive and efficiency hence lowering performance. The same paradox have been elaborated by Turban, et Automation of office was widely believed to be increasing productivity. However, the growth accounts didn't seem to confirm the idea. Between the year 190 and 1990 machine growth was very. In this case therefore this paradox in productivity caused a lot of contradictions. In this case therefore technology is being associated with diminishing returns in terms of the growth of the economy. According to a survey conducted in the USA by Shu and Strassmann (2005), between the year 1989 and 1997 it was discovered that despite the relevance of technology in productivity, chance of it increasing earnings of a bank are minimal.

Locally, Muyoka (2014) researched on the link between mobile banking and financial performance of commercial banks in Kenya. Outcome of this research revealed that banks that used mobile banking did well financially as compared to those that did not. Mobile banking brought about more deposit being made plus more transaction being experienced. Juma (2012) conducted an investigation on how the ICT contribute to the growth of commercial banks in Kenya. He found out those commercial banks in Kenya that embraced ICT experience more growth.

Aduda and Kingoo (2012) researched about the impact electronic banking to financial performance in the commercial Banks in Kenya and found out that is a optimistic correlation between electronic banking and bank performance. However, the study had a research gap since not investigate other the effect of other technologies such as mobile banking and ATM on financial performance. The research question, therefore, is; what is the effect of information communication and technological on the financial performance of commercial banks in Kenya?

1.3 Objectives of the Study

The research will be having general objective and the specific objectives.

1.3.1 General objective

Effect of information communication technology on financial performance of commercial banks in Kenya will be the general objective.

1.3.2 Specific objective

1. To determine the effect of automated teller machines on financial performance of commercial banks in Kenya.
2. To find out the effect that mobile banking has on financial performance of commercial banks in Kenya.
3. To find out the effect of internet banking on financial performance of commercial banks in Kenya.

1.4 Value of the Study

The outcome of the research is significant to various commercial banks in Kenya. It will provide insight on how the variables being studied affect the performance of their organizations. They will be able to appreciate how financial performance of their company is influenced by the variable under study. The study will also enable management especially those in banking sector to understand the ICT to concentrate on so as to optimize their performance. It will also provide insights regarding the importance of implementing information communication technology among the banking industry to achieve performance of firms.

Kenya bankers association, Central bank of Kenya and other policy makers will also find this study beneficial to them. Conclusions and findings of this study will guide them on investing on ICT to ensure efficiency and effectiveness in service delivery hence overall improvement in financial performance. Furthermore, researchers and other scholars will use this study to find more research gaps that they can study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews the literature concerning this study. The chapter starts by reviewing the theories that informed the discussion on information communication technology. It will then focus on the empirical studies that discuss the link between information communication technology and financial performance of commercial banks.

2.2 Theoretical Review

This part will look into the several theories that try to highlight the outcome of information communication technology on the financial performance of commercial banks. To this extent therefore there are various theories and models that relate ICT and financial performance. Several theories which include; resource based theory, technology acceptance model, and diffusion of innovation theory.

2.2.1 Resource Based Theory

According to Barney (1991) in his resource based theory when an organization is in possession of resources that are strategic in nature, it has a competitive advantage over it rival. As a result the firm is able to enjoy high profit. Wernerfelt (1984) also argues that resources that are strategic in nature are an important asset. Prehalad and Gary (1990) states that, firms align their resources, skills and expertise into core competence to gain a competitive edge against their competitors. Core competencies in this case are the activities that an organization does better than its competitors (Chi, 1994).

A strategy acts as an integral part of the organization's goals and objectives in a firm, strategy acts as a plan of action that links together a firm main objective, action and policies towards achieving the vision and the vision (Barney and Clark, 2009). A strategy that is well aligned to an organisation goals and objectives play an essential role of assembling and allocation of firm's wealth into a productive cause putting into consideration the firm's capabilities, external environment and contingent moves by their competitors. Mintzberg (1994) defines a strategy as a plan of actions that is designed to achieve certain goals and objectives.

2.2.2 Technology Acceptance Model

Davies (1986) was the main proponent of this model. Cracknell (2004) posits that firms are adopting technology to cope with the dynamics of the external environment. This model has been tailored in a manner that can accommodate changes for improved costs reduction and efficiency. Technology Acceptance Model (TAM) deals with perceptions instead usage (Davis, 1989).

The factors to consider are: Perceived usefulness (PU). According to Davis, it is the extent of one perception that results to improved performance (Britton and McGonegal, 2007). The TAM was proposed by Davis et al. (1989), this model expounds on the attitude behind the objective to use technology or a service. Acceptance is the first process in technology use and has a bipolar implication. First, acceptance is a precursor to adoption and hence this theory complements the preceding theories.

Acceptance model dictates the attitude and perception of the users which eventually affects efficiency of use and hence performance. Strategic adoption as well as operational efficiency and hence productivity of systems are a function of acceptance of the technology. It is thus plausible to conclude that without acceptance, the rest of the theories would be redundant and invalid. Though acceptance is an initial phase, it is also an attitude shaping facet that influences adoption and effectiveness of use (Davis, 1989).

2.2.3 Diffusion of Innovation Theory

Rogers' (1995) highlight the use of upcoming technologies. Rogers defines diffusion as 'the way of communicating innovation in a given time period to a given society' (Rogers, 1995). An innovation can be defined as idea that is taken to be different and new (Rogers, 1995). An idea is seen as different or new when t it has brought some changes or improvement. Rogers (1995) states that when an innovation is superior to its predecessor it is said to have relative advantage.

On the other hand, the term complexity according to Rogers (1995) is the extent whereby an innovation is seen as difficult to use and understand. Compatibility can be defined as the extent in which a given innovation relates with beliefs, needs and values of the adopters. On the other hand the term trialability can be used to refer to the degree in which with a limited basis an idea can be experiment. Last but not the least observability, refers to the degree to which innovations can be seen. Rogers (1995) further explains that this theory is important considering that it elaborate as to why commercial banks come up with a given technology.

2.3 Determinants of Financial Performance of Commercial Banks

2.3.1 Cost of Operations

Firms that are able to minimize their costs of operations are considered to be more efficient and it is also expected that they post higher profits margins than their counterparts that have higher costs of operations (Athanasoglou, et al., 2008). The costs associated with the maintenance of physical branches, marketing and labor can reduced to a large extent through adoption of ICT (Hernado and Nieto, 2007).

2.3.2 Ownership Status

Ownership status of the bank is another firm specific factor that has in the recent past drawn a lot of attention from researchers in financial management who are interested in the evaluating the determinants of the financial performance of commercial banks (Bonin, Hasan and Wachtel, 2004). In developing countries like Kenya, literature shows that foreign ownership brings in several advantages to the performance of commercial banks such as improved technology, risk management expertise, improved knowledge on corporate governance as well as increased competitiveness.

This advantages results into improved performance of the commercial banks in terms of improved efficiency in cost management which results in improved financial performance (Athanasoglou, Brissimis and Delis, 2008). It is therefore clear that foreign ownership leads to better financial performance of commercial banks in developing countries. Some of the empirical studies show that there is no significant negative effect of either government or private ownership on the financial performance of commercial banks (Bonin, Hasan and Wachtel, 2005).

Some studies on the other hand show that privately owned commercial banks post better financial results than government owned banks due to the improved efficiency associated with the private sector (Dietrich and Wanzenried, 2008). This means that the ownership of a commercial bank particularly in the developing countries like Kenya influences their financial performance in one way or another.

2.3.3 Size of Bank

A bank with more assets is able to make huge investments in technology and other input factors which increase the firm's efficiency as well as its customer base. In Kenya for example, one of the largest commercial banks when it comes to assets (Kenya Commercial Bank) has entered into various partnerships with Safaricom and other mobile networks to develop a mobile money transfer platform which has enabled to increase its revenues in a significant manner and thus its profitability (Ongore and Kusa, 2013).

2.3.4 Capital Adequacy and Liquidity

A bank with high liquidity is preferable due to its ability to execute these functions and thus make more money (Athanasoglou, et al., 2008). Commercial banks however have to establish a limit for the lowest cash reserves they can hold in order to ensure that customers are served smoothly. The Central Bank of Kenya, which is the institution given authority to control the commercial banks in kenya normally requires that commercial banks keep a certain amount of cash reserves as a way of protecting the interests of the depositors (customers) against losses since this is essentially their money (Central Bank of Kenya, 2013).

2.3.5 Credit Risk

Aduda and Gitonga (2011) studied how credit risk may affect profitability of commercial banks. The findings were that credit risk affects profitability to some extent. Nawaz and Munir (2012) found that credit risk management affected banks' profitability. They suggested that when coming up with credit policy, the management should be cautious and ensure the polies are favorable to financial performance.

2.3.6 Macro Economic Determinants

Commercial banks do not operate in a vacuum and this therefore means they are influenced by the conditions of the external environment. An economy with favorable macro- 20 economic conditions will give room for business to thrive and this also means that commercial banks will benefit from the increased business activities and thus improved profitability (Bodie, et al., 2005) Delis et al (2008) on the other hand used a linear regression model to evaluate the data collected from commercial banks in 80 countries. The empirical findings depicted an optimistic influence of macro-economic factors on the financial performance of commercial banks on selected nations.

2.4 Empirical Studies

Irechukwu (2000) conducted a study in Nigeria where when release a change in banking services due to. The banking services included; account opening, recording, and transaction processing and customer account mandate. Research concerning e-banking has concentrated on how technology has impacted on banks performance. For a firm to survive in a knowledge based economy it must be innovative.

Through enhancing new technologies by commercial banks they can improve their performance. Commercial banks should therefore grow their service delivery in e-commerce age (Agboola, 2001). Furst, Lang, and Nolle (2002) The ICT facilities comprise of; ATMs, MICR, smart cards, funds transfer, electronic data interchange, mobile banking, transfer, and among others (Agboola, 2002). ICT has provided self-service facilities that assist clients open accounts all by themselves. The self-services enable clients to order their cheque books, credit and debit cards and so on (Agboola, 2004).

According to Agboola (2004), ICT has become vital in strategy implementation, coming up with policies and so on global competition. ICT assist managers in planning and making available products and services in banking industry. Agboola (2004) further states that innovative components have been developed accelerate the delivery of services. In this case therefor when there is improvement in service delivery performance is also improved.

Lawrence (2004) in his paper titled "Customer Focus in Banking Services" had emphasized on importance of customer relationship management. One of the objective of banks should be to acquire new client and retain the existing ones. The banking industry must therefore use technology efficiently putting in mind the cost of product and services. To keep customers ICT should be used to do strategic marketing in older to optimize profit. According to DeYoung, Lang, and Nolle (2007), internet usage have increased community banking in U.S.A and hence high profitability improve. In a related research, Hernando and Nieto (2007) argue that that is associated with high profitability due to low cost. Both scholars conclude that internet banking works hand in hand with bank branches.

Gakure & Ngumi (2013) carried out study on whether bank ICT innovation influence net gains of commercial banks in Kenya. They concluded that development of technology in banks had a significant influence on bank profitability. To this extent therefore bank information communication and technology in this study is crucial in explaining the profits of commercial banks in Kenya. In Kenya for example, the banks revenue and ability to cut cost have improved due to technology such as agency banking, mobile banking and internet banking.

2.5 Conceptual Framework

A concept can be defined as a thought derived from a given scenario. The main goal of a conceptual framework aligns and describes concepts that are significant to a given research and depict the relationship between them. This research aims to find out the effect of ICT on financial performance of commercial banks of Kenya. The main ICT adopted by Kenyan commercial firms include ATMs, mobile banking and internet banking (Kombo and Tromp 2009)

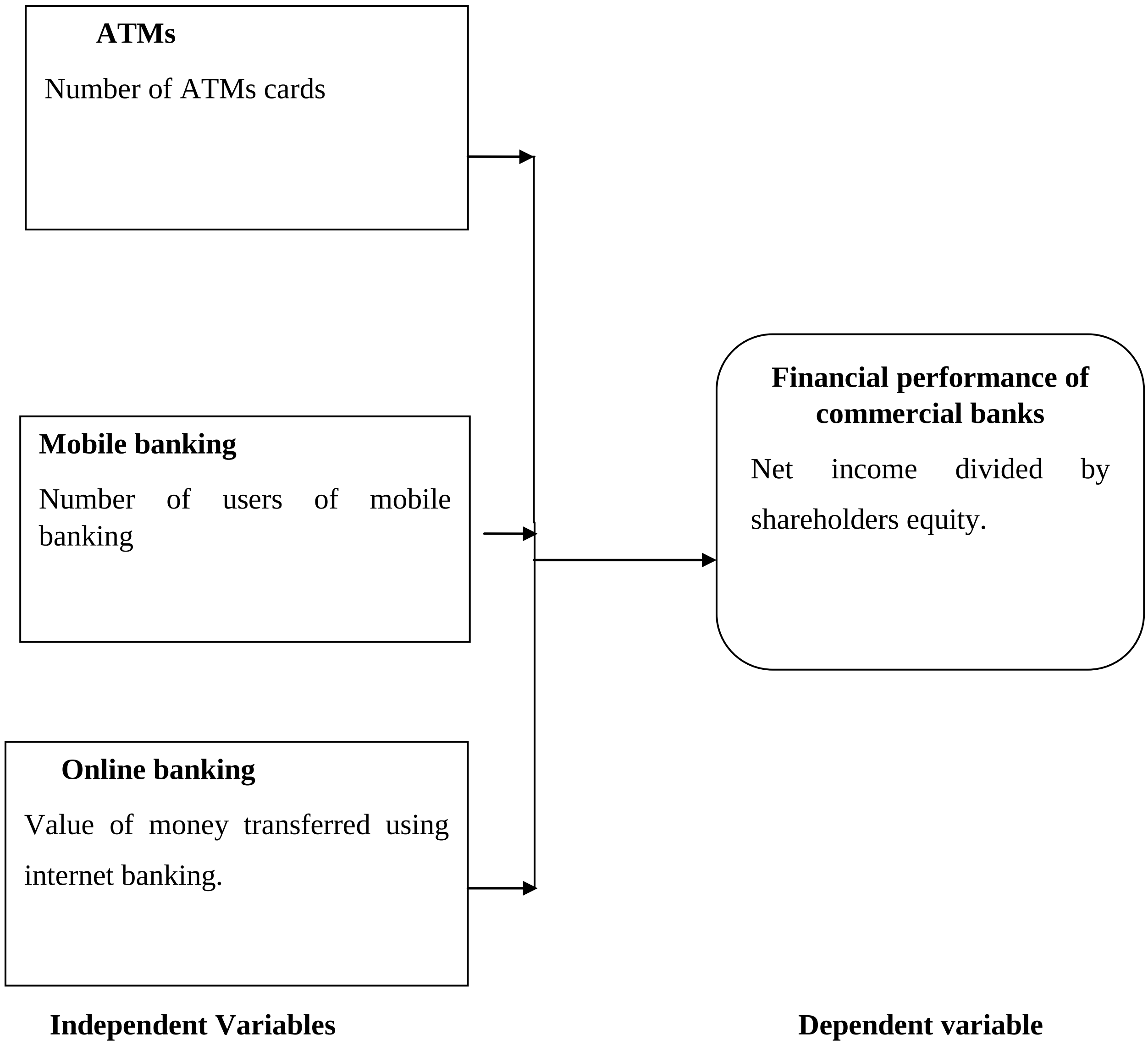

Figure 2.1: Conceptual framework

2.6 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 effect 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 existence of an optimistic link between ICT and financial performance of financial institutions such as banks. The wealth of firms is usually affected by technology (Ayres 2008. To this extent therefore, there need to find out the influence of technology on banks. Not many studies that have been carried out to find out the effect of technology on financial performance regardless of the fact that many banks have been adopting technology.

The available written materials gives light concerning how technology is being put into use. The studies done to other companies may not be very usefully in relating the effect of technology on banks considering the fact that the companies operate in context that are different from those of commercial banks. For reason, the aim of this research is to find out the impact of ICT on financial performance of commercial banks in Kenya.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This section highlights different aspect among them the methodology that was employed. It also describes the research design that was used, the sample design that was employed, how data was collected and finally but not the list how this data was analyzed.

3.2 Research Design

Research design can be described as a procedure explaining how the data was collected and later analyzed. This is usually done with the focus of answering a given the research questions (Creswell 2009). This research work made into use the descriptive research design reason being the fact that it highlights a characteristic behavior on one variable because of another variable (Kothari, 2005). This kind of design was appropriate in establishing the effect of ICT on financial performance of commercial banks in Kenya. The study made into use a cross-sectional study since it seeks to observe data over a five year period. According to Kothari (2005) a cross sectional study depicts the characteristics that exist in a group or any other relationship that exists, but it cannot be used to determine any relationship that may exist.

3.3 Population

Kothari (2004) notes that population is a total collection of elements with apparent characteristics which can be used to make inferences. A population can be define as group of cases where the sample is derived from (Saunders 2007) .All the forty three commercial banks that are licensed to operate in Kenya formed the population under study.

3.4 Sample Design

The sample size is the part of the target population that was selected by the researcher for the purpose of data collection. The study adopted a census study of all the banks. Census study is appropriate in cases where we have small population. When the population is not large the sample work may inadequately represent the whole population.

3.5 Data Collection

The nature of the data collected was secondary. This was enabled by the fact that this data was quantitative. A 5 year period is good enough to discover the trend in a given data (Kieso, et al., 2007). The previous similar research done had also analyzed data from the 5 years period. In this case therefore the five years period data was collected from the year 2012 to 2016. In this study, the data that was collected was specifically related to the number of ATMs cards issued, number of users of mobile banking and the value of money transferred via internet banking.

3.6 Validity and Reliability

The term validity can be defined as the length in which a count, signal or technic of data collection consist of characteristic of being true and fair beyond reasonable doubt Jary,D.& Jary,J. (1995). Joppe (2000) refers to reliability as the degree in which consistence and accuracy of results is seen as a representation of the rest of the population. Reliability can be said to exist if similar results can be produced with the whole population under study. Simon (2013) defines Data validation as a process which ensures the correspondence of the final (published) data with a number of quality characteristics. Identity check method will be used to ensure validity of data.

3.7 Data Analysis

In the analysis of the data collected, the researcher should find out the statistical data analysis tools. Data collected was cleaned, sorted and coded using SPSS and MS Excel. Research findings were presented in form of tables, tabulations, mean, and standard deviation and co-efficient of variation was used to present the data. Minimum, maximum, mean and standard deviation was employed in determining the trend between the variables. Regression analysis was applied in establishing the relationship between the variables under investigation.

3.7.1 Regression Model

The study adopted a regression model to discover the effect of information communication technology on financial performance of commercial banks in Kenya.

$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e$

Y = is the financial performance which was measured using net income divided by shareholders equity.

X_1 = represents number of ATMs cards

X_2 = No of users of mobile banking

X_3 = is internet banking which was determined by the value of money transferred using internet banking.

β_0 = is the regression gradient showing change in Y as a result of change in X.

€ = Is the error term at 5 % confidence level

3.7.2 Test of Significance

This study used the coefficient of determination (R^2) to evaluate the level to which variation in information communication technology (independent variables) explained the variances in financial performance. A multicollinearity test was used to determine the extent to which the independent variables were correlated. Normality test were also conducted by using skewness and kurtosis measures

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This section discusses, does analysis, and provides results of the findings. The analyzed data was presented in the form of mean, standard deviation, coefficient of variation and tables. It presents analysis of the data to determine the effect of information communication technology on financial performance of commercial banks in Kenya. This section also gives the findings of the study.

4.2 Response Rate

In this research secondary data was used. The term secondary data refers to data that is collected for other goal different from those of the researcher. The study targeted all the 43 commercial banks in Kenya but complete data was obtained from 39 commercial, which were fully operating for the period between 2011 -2015. The four banks in which data was not collected from where receivership and under statutory managements and had no complete published financial statements. The 39 commercial banks made up a response rate of 90.8%, which was considered representative of all the commercial banks.

4.3 Data Validity

To ensure validity of the data the identity check method was used where by the profit from the balance sheet was expected to be the same as that in the profit and loss account. Using the same method return on equity was checked to ensure that it was equal to the net income divided by the shareholders equity. The character check was also used to ensure that that non-numerical data was not included in the data analyzed.

4.4 Descriptive Statistics

Descriptive statistics was used to summarize collected data in terms means, standard deviations, coefficient of variation, kurtosis and skewness for each study variable.

Table 4.1 Descriptive Statistic Summary

	N	Minimum	Maximum	Mean	Standard deviation	Co-efficient of variation	Kurtosis	Skewness
ROE (%)	20	24.68	29.79	27.43	2.34	0.09	-1.96	-0.33
No of ATM cards 'millions'	20	2.06	4.64	3.22	0.63	0.20	-0.10	-0.60
No of Users of Mobile baking	20	3.46	7.01	5.29	1.06	0.20	-0.95	-0.16
Value of money transferred internet banking ("m")	20	4.76	8.58	6.23	1.00	0.16	0.12	0.30

Source: Research Findings

Results of table 4.1 shows mean financial performance which is being measured by ROE ratio of the commercial banks in Kenya with maximum and minimum ROE being 29.79% and 24.68% respectively. In this case therefore the range for ROE is 5.11% The measure of distribution of the variables indicate that the return on shareholders' equity, number of ATM cards, number of users of internet banking and the value of money transferred via internet banking all have a normal distribution curve because all have skewness that is out of the (-3,3 and 3.0) interval.

The kurtosis for the return on shareholders' equity, number of ATM cards and number of users of internet banking is less than zero and hence it is a light tail referred to as platykurtic distribution. On the other hand internet banking has a kurtosis which is more than zero which indicate that it has heavier tail also known as leptokurtic distribution.

4.5 Correlation Analysis

This are will show the correlation that exists among the dependent and independent variable and multicollinearity among independent variables.

Table 4.2: Correlation analysis

	ROE	Number of ATMs cards	No of users of mobile	Value of money transferred internet banking
ROE (%)	1			
Number of ATMs cards	0.87	1		
No of users of mobile banking	0.77	0.06	1	
Value of money transferred internet banking	-0.76	-0.37	-0.23	1

Source: Research Findings

The finding on table 4.2 indicates a positive correlation ATM and mobile banking on financial performance of commercial banks in Kenya. ATM cards and Internet banking have a negative correlation on financial performance of commercial banks. The number of ATM cards and mobile banking has a positive correlation. On the other hard the number of automated teller machine cards and the internet banking has a negative correlation. Also mobile baking has a negative correlation with internet banking.

4.6 Regression Analysis and Hypotheses Testing

Discuss the model summary results, the analysis of variance (ANOVA) and the model coefficients.

4.6.1 Model Summary

Table 4.3 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.98	0.95	0.94	0.56

Predictors: (Constant), ATM cards, mobile banking and internet banking

Source: Research Findings

Table 4.3 shows R square which is also referred to as the coefficient of determination. It describes the change in dependent variable that is due to variation in independent variables. In the above table, R squared value was found to be 0.95, This depicts that variation of independent variable accounted for 95% of variation in commercial banks performance. Independent variables being: automated teller machines cards, mobile banking, and internet banking. R is the correlation coefficient and it explains the link between the independent and dependent variables an estimate of 0.98 depict a strong linear link among the dependent and independent variable.

4.6.2 ANOVA

Table 4.4 shows the Analysis of Variance (ANOVA) results.

Model Sum	Sum square	Df	Mean square	F	Sig
Regression	98.78	3	32.92	103.56	0
Residual	5.09	16	0.31		
Total	103.87	19			

a. Dependent Variable: ROE
b. Predictors: (Constant) ATMs , mobile banking and internet banking
Source: Research Findings

In the above table the effect of ICT on financial performance have been shown using regression model which is significant to explain the effects of information communication technology on financial performance of commercial banks in Kenya because the p-value of 0.001 is smaller than significance level value 0.05

4.6.3 Regression Coefficients

Table 4.5 Regression Coefficient

Model	Unstandardized Coefficient		Standardized co-efficient	t	Sig
	B	Std. Error	Beta		
Constant	30.15	0.566		19.03	0.00
ATM	0.21	0.015	0.67	0.96	0.03
Mobile banking	1.37	0.016	1.63	10.9	0.00
Internet banking	-1.49	0.025	-1.79	-10.45	0.00

Source: Research Findings

Results on table 4.5 generates the following equation

Y=30.15 +0.21X1+1.37X2-1.49X3

In the above table 4.5 it displays outcome of regression coefficients. The coefficient for automated teller machine cards is 0.21. In this case therefore it is significant when using alpha of 0.05 considering it has a p-value of 0.03 that is less than 0.05. Mobile banking has a coefficient of 1.37. In this case therefore it is significant when using alpha of 0.05 considering it has a p-value of 0.00 that is less than 0.05. Internet banking has a coefficient -0.49 which is significant when using alpha value of 0.05 considering it has a p-value of 0.00 which is less than 0.05.

4.7 Discussion of Research Findings

The study was set out to investigate the effect of adoption of information communication technology on profitability of the commercial banks and in deed the findings were positive affirming that relationship. This supports other studies which have been carried out in this area. According to a study done by Kozak (2005) who researched on the influence of IT on profit and cost, he discovered that, there was an optimistic link between IT productivity and cost reduction. This study was carried out between the year 1992 and 2003. In another study carried out by Brynjolfsson and Hitt (2000) they found out that IT is a significant contributor to a company's output. In this case therefore they also discovered that the IT employees were more productive as compared to non-IT employees. They also discovered that IT was responsible for 81% marginal increase in output.

In future the ATMs will be relevant in enhancing customer care and relationship. They will also be used as marketing tools. This will allow financial institution take caution of declining profitability by ATMs.The findings concur with (Porter and

Millar, 1985) that information communication technology has resulted into adjustment in industry structure and competition and many firms have used information communication technology to support the creation of new businesses.The use of ATMs has cut service staff in traditional banks, ATM ensures that when working hours are over the customer can continue enjoying the services without the need of human labour or staffing.

In the research, it was discovered that coefficient for users of mobile banking was 0.77 meaning that number of users of mobile banking positively and significantly influenced the financial performance of commercial banks in Kenya. This correlates with Leow (1999) who states that, there are numerous advantages of mobile banking to both the bank and the customers, the cost of operating mobile banking are minimal as compared to the cost of installing ATMs. Mobile banking also ensures convenience, saves time as well as cutting cost. The finding of this study is also consistent with similar studies in Saudi Arabia that employed the same methodology and ascertained that availability of mobile banking had a positive effect on profit efficiency of Saudi banks. As Nader (2011) puts it the results showed that the most crucial factor of determining efficiency of the profit was the mobile banking and the ATM machines. In this case therefore the results were in line with his idea that presence of mobile banking is what determines profit efficiency rather than any other factor in the study.

According to a research by Maina (2012) which assessed the role of mobile banking to financial performance of commercial banks asset selection, revealed that mobile banking contributed to profitability of commercial banks in terms of cost efficiency, from the findings of the study 70% of financial institutions in Kenya had adopted information communication technology (mobile banking) which enabled them to serve more clients within a shorter time hence boosting the financial performance over time.

The study found a strong negative effect of internet banking on financial performance. The findings are similar to a study carried out in USA by Egland et al.1988. In his study he focused on the US banks that provided internet banking in which he did analysis of their structure and characteristic of their performace. In this study no major difference was noted seen between the banks that offered internet banking and those that did not in terms of efficiency, credit quality and profitability. Furst et al. (2000) discovered that those banks that employed internet banking were more profitable than those that did not. A different view to that of best performance by internet banks was the de novo or new startups internet banks which exhibited low profitability and low efficiency. The researcher concluded that the use of internet banking was a negligible factor in determining banks profitability of commercial banks.

According to a study done by Sullivan (2000) , the mortar banks found at tenth federal reserve district registered more operating cost but was brought done by having a good income from fee. The study also discovered that tentatively that internet banking either helped or destroyed the banks. Sathye (2005) did a research on the effect of on internet banking on performance and risk. This research was done among the big credit unions that were based in Australia. The results of this study were similar to those of Sullivan (200) where it was concluded that the use of internet banking was not one of the tool that contributed to performance among the credit unions in Australia

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This section will give a summary of the findings of this research, conclusions, recommendations, limitations of the study and suggestion of areas, which may require further consideration as far as future research, is concerned. The secondary data in this analysis was taken from year 2012 to 2016. The 43 commercial banks licensed to operate in Kenya comprised the population of the study. The aim of this research is to find out the effect of information communication technology on financial performance of commercial banks in Kenya.

5.2 Summary of Findings

This research was carried out through the use of a descriptive design. The population consisted of all the fourth three commercial banks in Kenya and therefore a census survey was carried out. The study depend on the secondary data which was collected using data collection sheet from the annual audited reports available at the central bank of Kenya. Data was analyzed using multiple regression. One of the variables used in the study was the automated teller machine, which was measured using the number of automated teller machine cards issued. The automated teller machine and financial performance had a turned out to have positive correlation of 0.87. The findings support Simpson (2002) suggestion that ATM is motivated by the need to cut operational cost and maximize revenue.

Relating to mobile banking the study revealed the raise in mobile banking will lead to improvement in the financial performance of commercial banks. The study also found a strong positive correlation between financial performance of commercial banks in Kenya and adoption of mobile banking strategy of funds as shown by the regression coefficient for the number of users of mobile banking was 1.37 at 0.00 levels of confidence meaning that number of users of mobile banking positively and significantly influenced the financial performance of commercial banks in Kenya. Correlation coefficient between mobile banking and financial performance was 0.77 meaning an increase in mobile banking by one unit will increase financial performance by 0.77 units. In this case therefore mobile phone banking can reach those who cannot easily access allows bank. It enables the customers to check their account balances which increase the banks customer, mobile phone banking will be the mobile phone which is easily accessible to large number of customers, mobile banking is convenient to customer as they can perform transaction at their seat which increase the market penetration.

The study also established that with mobile banking, users of mobile phones can perform several financial functions conveniently and securely from their mobile. In this regard therefore clients can pay bills, transfer funds, know where the nearest ATM is, see the recent transaction, make cheque deposit, know the balance in their account, make transfer of cash. I this case the services above are usually available twenty four hours a day, seven days a week and three hundred and sixty five days a year.

The study also established that internet banking affects the financial performance of commercial banks in Kenya. The research also found strong negative correlation between financial performance of commercial banks in Kenya and internet banking(-0.76). The study also found out a significant negative correlation coefficient (Pearson correlation coefficient r = -1.49 Sig. = p – value 0.00). The speed of adopting internet banking has been relaxed due to lack of needed infrastructure and laws to support it (Nyangosi et al 2009).

The study set out to find the effect of adoption of ICT on financial performance of the commercial banks. In this case therefore the reach got a positive results which are in line with the previous research done. According to a research done by Koxak(2005) on the influence of ICT on profit and cost management between the year 1992 and 2003, the research depicted a positive results of IT on productivity and cost savings. In another study carried out by Brynjolfsson and Hitt (2000) they found out that IT is a significant contributor to a company's output. In this case therefore they also discovered that the IT employees were more productive as compared to non-IT employees. They also discovered that IT was responsible for 81% marginal increase in output.

5.3 Conclusion

The adoption of information communication technology is one of the crucial agent in future growth and development of financial sector of the economy especially the developing economies like Kenya. The adoption of in formation communication technology is of vital importance in ensuring that banks remain competitive. In this regard therefore with technology at hand it enables easy in service delivery and improve the standards of service delivery.

The study also found positive correlation coefficient between financial performance of commercial banks in Kenya and ATMS cards usage. The study also revealed that ATM offer financial institutions the opportunity to transform the ATM from a cash dispenser to a customer relationship management platform, helping to improve loyalty among all customers, particularly those who majorly use the ATMs. The study concluded that ATM has negative effect on financial performance of commercial banks in Kenya.

The study also discovered that the effect of internet banking and financial performance of commercial banks in Kenya is strong and negative, there are some cases showing positive relationship. Thus, the relationship between online banking and financial performance of commercial banks in Kenya remains a controversial. These shows there are mixed results about the effect of between internet banking and financial performance of commercial banks in Kenya.

Mobile banking is being used for the purposes of improving financial operations in commercial banks. There are measures that have been employed by the banks to ensure that they beat competition. This is done through staff training and development and investing more resource in technological research and development. Over time the use of mobile banking will enable smooth running of business operation and hence growth in profitability. In this case therefore the study concluded that mobile banking has a positive influence on financial performance and hence there is need to continue investing more in mobile banking.

In order to handle the drawbacks of information communication technology, there is the need to comprehend characteristics of changes that are brought by innovation and demography. ICT cannot successes without us first understanding these changes.

Because of the fact that banks are now able to understand the technological banking aspect, they are now in a position to make good decision on how to change the ICT for the betterment of their organization. To survive in today's competitive environment banks are now using the ICT as part of their strategy to beat this competition.

5.4 Recommendation

According to the findings and conclusion of this study, the following recommendations have been suggested in relation to the effect of information communication technology in commercial banks. There is need for commercial banks to enhance information communication technology since this will provide the benefits of continuous access to vital services and reducing the need for one to go to the banking hall. The use of information communication technology by the banks has prompted agreements to share systems through and 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 information communication usage will lead to increased customer satisfaction due to more choices being 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 attain 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.

Based on the study findings, the study recommend that commercial banks should investment in ATMs and mobile banking as this was found to have positive influence on financial performance. In this case therefore the researcher recommends that commercial banks should keep investing in ATMs and also using the mobile banking in their daily operations. This is due to the fact that the people who owns mobile phones are increasing day by day.

To this extent therefore the coming together of mobile phones and banking activities has changed the operations of commercial banks. For instance Commercial Bank of Africa in collaboration with Safaricom has come up with M-shwari. M-shari enables the subscribers to save money, borrow money and make repayment at the touch/press of the phone. These give users convenience and save them paperwork. This new development in mobile banking have therefore revolutionalised the banking operations and hence growth in profitability.

5.5 Limitations of the Study

The target population in this study consisted of commercial banks that were dully registered with Central Bank of Kenya; this left out the larger population of financial institutions such as SACCOs, insurance companies, micro-finance institutions who have also established adopted ICT in their operations. In this case therefore this limited the scope that information communication technology covers in the financial sector of the Kenya economy.

This study focused on number of ATM cards, users of mobile banking and value of money moved via internet banking and the effect on financial performance of commercial banks in Kenya.. Hence, the scope of the study is commercial banks in Kenya and no other organizations in Kenya since the financial performance of different organizations is influenced by other factors separate from the one used in this study and the ones in the banking sector.

The study also examined the quantitative factors, which influence banks' profitability using data obtained from financial statements and measured using financial ratios. However, accounting data is prepared on standardized procedures, which may leave out qualitative aspects. In addition, accounting ratios may not represent the current situation of the profitability of the banking sector.

5.6 Suggestions for Further Research

The study aimed at determining the effect of adoption of information communication technology on financial performance of commercial banks in Kenya. The study recommends that a further study should be done on the challenges facing the adoption of information communication technology in commercial banks in Kenya. The effect of other ICT variables such as agency banking and its effect no financial performance should be researched on. Also the challenges facing agency banking should be researched.

The study also recommends that further studies should be done on the effect of online banking on other banks operations and customer acquisition. A similar study should also be done whereby the data collection relies on primary data. The study found that mobile banking have a great influence on financial performance than internet banking and automated teller machine therefore a study needs to be conducted to investigate why this is the case. It is therefore further recommended study be conducted from customer's perspective usage of internet banking and automated teller machines.

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. The research also recommends a case study to be done on the same topic which will probably uncover more.

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APPENDICES

APPENDIX I: LIST OF BANKS

1. ABC Bank (Kenya)
2. Bank of Africa
3. Bank of Baroda
4. Bank of India
5. Barclays Bank of Kenya
6. Chase Bank Kenya (In Receivership)
7. Citibank
8. Commercial Bank of Africa
9. Consolidated Bank of Kenya
10. Cooperative Bank of Kenya
11. Credit Bank
12. Development Bank of Kenya
13. Diamond Trust Bank
14. Dubai Islamic Bank
15. Ecobank Kenya
16. Equity Bank
17. Family Bank
18. First Community Bank
19. Giro Commercial Bank
20. Guaranty Trust Bank Kenya
21. Guardian Bank
22. Gulf African Bank

23. Habib Bank AG Zurich
24. Housing Finance Company of Kenya
25. I&M Bank
26. Imperial Bank Kenya (In receivership)
27. Jamii Bora Bank
28. Kenya Commercial Bank
29. Mayfair Bank
30. Middle East Bank Kenya
31. National Bank of Kenya
32. NIC Bank
33. Oriental Commercial Bank
34. Paramount Universal Bank
35. Prime Bank (Kenya)
36. SBM Bank Kenya Limited
37. Sidian Bank
38. Spire Bank
39. Stanbic Bank Kenya
40. Standard Chartered Kenya
41. Trans National Bank Kenya
42. United Bank for Africa
43. Victoria Commercial Bank

APPENDIX II: DATA ANALYSED

Year	Quarter	Net income (ksh "m")	Shareholders' equity (ksh "m")	ROE (%)	NO OF ATMs cards "milllion"	No of users of mobile banking ("m")	Value of money transferred internet banking ("m")
2012	Q1	25,563	85,807	29.79	3.13	4.99	4.76
	Q2	26,211	87,982	29.79	3.38	5.17	4.83
	Q3	27,425	92,057	29.79	3.35	5.46	4.94
	Q4	28,700	96,337	29.79	3.14	5.97	5.35
2013	Q5	29,785	101,011	29.49	3.81	5.50	4.81
	Q6	30,596	103,762	29.49	3.96	5.97	5.59
	Q7	31,893	108,160	29.49	4.07	6.53	6.08
	Q8	33,486	113,563	29.49	4.16	7.01	6.19
2014	Q9	33,047	116,004	28.49	2.90	5.76	5.68
	Q10	34,322	120,479	28.49	2.90	6.08	6.37
	Q11	36,275	127,335	28.49	2.51	6.50	6.81
	Q12	37,501	131,639	28.49	2.06	6.76	6.70
2015	Q13	31,675	128,237	24.70	4.64	4.39	6.45
	Q14	33,350	135,019	24.70	2.75	4.53	6.94
	Q15	33,700	136,435	24.70	2.80	4.96	8.58
	Q16	35,292	142,881	24.70	2.81	5.12	7.62
2016	Q17	35,180	142,574	24.68	3.39	3.46	6.86
	Q18	36,521	148,008	24.68	2.88	3.66	6.44
	Q19	37,556	152,203	24.68	2.95	3.86	6.49
	Q20	38,187	154,760	24.68	2.77	4.02	7.10