EFFECT OF MOBILE PHONE BANKING ON PERFORMANCE OF COMMERCIAL BANKS IN KENYA

BY

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DECLARATION

I declare that this dissertation is my original work and has not been previously published or submitted elsewhere for award of a degree. I also declare that this contains no material written or published by other people except where due reference is made and author duly acknowledged.

Name:_____   Reg.No:_____

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I do hereby confirm that I have examined the master's dissertation of

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And have certified that all the revisions that the dissertation panel and examiners recommended have been adequately addressed.

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Dissertation Supervisor

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ABSTRACT

Globalization is making the financial world more interconnected and organizations are continuously coming up with financial products that are very innovative. The world has also been taken by storm through financial interconnectivity and information technology which has now engulfed data transfer across all spheres putting the command in the hands of individuals through mobile handsets. This has gone to change the way business is done bringing with it speed, efficiency and effectiveness which transmits into economic growth and development. Various initiatives use the mobile phone to provide financial services to those without access to traditional banks everywhere in the world. Mobile banking services give a high potential to expand financial services particularly payment services to the poor. The services also provide a cost effective and convenient way to access bank accounts. The general objective of my study was to investigate the effect of mobile phone banking on performance of Commercial banks in Kenya. The population of my study was the 43 Commercial banks operating in Kenya as at 31st December 2014 with the sample being 10 in number. The sample size was 200 respondents. Descriptive research method was employed. To determine the reliability of the tools employed, the Cronbach's alpha test was conducted. To determine the linear relationship between all the study variables, Spearman's Rank Correlation Coefficient was used. Tests to determine violation of OLS assumptions were carried out. Results presented in the regression model summary indicated that the R squared for the regression was 0.458.The ANOVA indicated that F value was 29.532 and was significant at 95% confidence level. Results showed that storage of monies for safe keeping and transfer of monies from one owner to another were not a significant predictor of performance of banks. However, exchange of forms of money through mobile banking and investment of monies had a significant effect on performance of banks. The main recommendations were that apart from KCB and Equity, the other commercial banks in Kenya should come up with products and services similar to CBA'S Mshwari and that local commercial banks in Kenya should diversify their investments before technology pushes them out of business. A future researcher can conduct a research with the aim of determining the effects of mobile payments on other business organizations.

Keywords: Performance, Banks, Mobile Banking, Additive Model, Transformative Model, Technology Acceptance Model.

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DEDICATION

I dedicate this thesis to my parents Mr. and Mrs. Philemon Abong'o Arodi. They had been a

great source of encouragement during my study period. They provided financial and emotional

support and always remembered me in their prayers.

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LIST OF ABBREVIATIONS AND ACRONYMS

ANOVA   Analysis of Variance

BBK   Barclays Bank of Kenya

BEM   Book Entry Money

CCK   Communication Commission of Kenya

CFC   CFC Stanbic Holdings

CO OP   Cooperative Bank of Kenya

CRB   Credit Reference Bureau

DTB   Diamond Trust Bank group

DTMs   Deposit Taking Micro Finance Institutions

EQTY   Equity Bank group

EXC   Exchange of forms of Monies

ES   Efficiency structure

F   Frequency

GSM   Global System for Mobile Communication

HFCK   Housing Finance company of Kenya

ICT   Information and Communication Technology

INV   Investment of Monies

IT   Information Technology

KCB   Kenya Commercial Bank Group

M-Banking   Mobile banking

M-Payments   Mobile Payments

M-Money   Mobile Money

M	Means
MVNO	Mobile Virtual Network Operator
NBK	National Bank of Kenya
NIC	National Industrial Credit Bank
OLS	Ordinary Least Squares
PC	Personal Computer
PIN	Personal Identification Number
PER	Performance of banks in Kenya
SCBK	Standard Chartered Bank of Kenya
SD	Standard Deviation
SME	Small Medium Enterprise
SMS	Short Message services
SSA	Sub Saharan Africa
STO	Storage of Monies
T%	Total percentage
TAM	Technology Acceptance Model
TF	Total Frequency
TRA	Transfer of monies
USSD	Unstructured Supplementary Services Data
VIF	Variance Inflation Factor
$\overline{X}$	Mean

OPERATIONAL DEFINITION OF TERMS

Performance: Performance can be defined as the attainment of set goals using resources efficiently and effectively (Schroeder, 2012).

Bank: According to the banking act cap 488 of the laws of Kenya, a bank is a corporate body which engages or proposes to engage in banking business and includes the Co-operative bank of Kenya but excludes the Central bank of Kenya. Therefore for a person to conduct banking business in Kenya, one must be a corporate body incorporated under the companies Act Cap 486 of the laws of Kenya (The banking Act Chapter 488, 2010)

Mobile Banking: Mobile banking is a term used for performing banking transactions or acquiring bank account information via mobile devices (McGregor, 2013).

Additive Model: The model of providing financial services through a mobile phone linked to a bank account (Guitterez and Singh, 2013).

Transformative Model: This is where non banks issue electronic currency to offer customers payment services and value Storage services (Guitterez and Singh,2013).

Technology Acceptance Model: This is a theoretical model that explains how users come to accept and use a technology (Davis,1989).

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Mobile banking is a system that allows customers of a financial institution to conduct a number of financial transactions through a mobile device such as mobile phone or personal digital assistant. According to Guitterez and Singh (2013) mobile banking is the use of mobile phones to conduct financial and banking transactions. According to Klein and Mayer (2011) mobile banking is the use of mobile phones to make financial transactions. Mobile banking can also be defined as the use of a mobile phone to carry out transactions on one's bank account. The bank account must be linked to the phone number of the customer.

Mobile banking represents a key area of financial innovation in recent times and is a major contributor to financial inclusion. Developing countries have a high rate of financial exclusion. According to Kent and Klapper (2012) half of adults in the world have not accessed bank accounts formally. This figure raises among low middle income individuals among developing countries. However, more than a billion of those who do not have formal bank accounts own a mobile phone. For this reason, there is a potential to reach the traditionally undeserved population portions (Guitterez and singh, 2013).

According to Donner and Tellez (2008) the spread of mobile phones across the developing world is one of the most remarkable technology stories of the past decade. They add that voice calls and text messages has been made part of the daily lives of millions of first time telephone owners. According to Porteous (2006) there are probably more people with mobile handsets than with bank accounts across the developing world. Mobile phones provide financial services to the unbanked using various initiatives. These services include remittances, small payments, and go by various names, including mobile banking, mobile transfers, and mobile payments (Donner and Telez, 2008).

Mobile banking has enabled a financial revolution to take place. In the late 1990's in Kenya, opening a bank account was not easy. One had to show evidence of a strong liquidity position. Nowadays, due to competition in the banking industry and competition by other entrants in the market, almost everybody whether coming from Kibera and Mathare slums or the up market areas of Nairobi can own a bank account. This has been enabled or made easier through the use of mobile phones. There are more people with mobile phones than with bank accounts in the developing world (Porteous, 2006) and therefore this has enabled financial inclusion.

Mobile phone banking is a form of branchless banking. These schemes are coming up everywhere in the world. Another form of branchless banking schemes is by use of point of sale devices across shops but mobile banking seems to be growing faster than these forms of payments. An example of mobile money is M-pesa in Kenya. M-pesa has enabled financial inclusion to previously undeserved citizens. M-pesa's partnership with many banks has enabled mobile phone banking to take place.

Mobile money has resulted in reduced costs of cash access and convenient means of payment. This is advantageous especially to communities that had previously no access to formal means of exchange (Klein and Mayer,2011). Mobile banking also provides communities access to individual networks, merchants and institutions from which they were previously excluded. The potential to reach service providers like insurance for health, lending products and savings products has substantially increased since the advent of mobile banking.

Mobile banking also facilitates development of trust relations. Mobile banking permits record keeping. It provides instantaneous transactions record. Transactions can also be easily traced which makes it different from past situations where cash transactions were unverifiable and anonymous Klein and Mayer (2011). Mobile technology through mobile phone banking has enabled financial transactions in poor countries particularly payments and savings. This in turn increases revenues for banks through transaction costs. Mobile phone banking clearly distinguishes between payments and banking. According to Klein and Mayer (2011), mobile phone banking transactions has four components. These are exchanges of forms of money, keeping money safe, money transportation and money investments. Donner and Telez, (2013) describe this components as storing of values in an account linked to the handset, converting cash in and out of the stored value account and transferring stored value between accounts.

Mobile phone banking have all the markers of an innovation waiting to be diffused to or adopted by a subset of mobile users in the developing world (Rogers, 1983). Rogers' model studies diffusion from a change communication framework to examine the effects of all the components involved in the communication process on the rate of

adoption. Rogers (1996) identified the differences both in people and in the innovation. The model provides the guidelines for the change agents about what attributes that they can build into the innovation to facilitate its acceptance by the intended adopter. One challenge with mobile banking is complexity; even simple handsets have features buried deep in menu structures. If navigating an M-banking interface is difficult for experienced mobile users with bank accounts, even greater is the difficulty for first-time users in the developing world, many of whom will have only been using a mobile for a year or two (Cracknell, 2004;Peevers,Douglas and Jack,2008).

However, the challenges may run deeper than interface design. People coming to banking for the first time via the mobile handset require a command of abstract concepts about invisible or virtual money. Beliefs, misunderstandings, habits, and concerns must be addressed if people who are used to storing money in cash are asked to store it in a handset; the analogy remains strained the mobile is not yet a wallet Chipchase, Persson, Piippo, Aarras and Yamamoto(2005)

Up until July 2014, the mobile money market size was about 26 million users with the values transferred up to that date being kshs. 190 billion, the dominant telecommunication company in Kenya was and has been Safaricom with its Mpesa services. The number of mobile payment agents upto that date totaled 120781 while the number of transactions was 74 million CBK Reports (2014). M-money providers have partnered with commercial banks such as Equity Bank, I&M Bank, Kenya Commercial Bank, Barclays and Co-operative bank to offer mobile based financial products that aim to reach the unbanked (OkiroandNdung'u,2013).

1.1.1 Contextual overview of mobile phone banking in Kenya

In the recent past, due to technology and market changes, banks have seen the need to come up with mobile phone banking products. Mobile networks in Kenya that have offered m-money services include M-pesa by Safaricom, Orange money by Orange, Yu-cash by Essar, and Airtel money by Airtel. Other mobile money companies in Kenya are Mobikash and Tangaza pesa. Mobile phone banking services provides easy access to one's account from time to time and from anywhere, the services takes convenience to the next level as one can perform real time transactions over the mobile phone by use of various commands, funds can be transferred to your account, to other accounts within the same bank and to accounts in other banks, one can check his/her account balance and mini statement, transfer funds from bank account to mpesa account and vice versa, purchase airtime, pay utility bills, order account statement, order cheque books and for some banks, it is accessible when one is on the mobile provider's roaming facility.

The history of mobile money started with mpesa in Kenya which was introduced in March 2007 and has since shown tremendous growth since its inception. In developed economies, mobile banking made its first appearance in the year 2001. Additive model is the model of providing financial services through a mobile phone linked to a bank account while transformative model is where non-banks issue electronic currency to offer customers payment services and value storage services (Guitterez and Singh, 2013). The Technology acceptance model which is an information systems theory that models how users come to accept and use a technology (Davis, 1989) also applies here. The TAM suggests that when users are presented with a new technology, a number of factors influence their decision about how and when they will use it. As mobile phone usage and

levels of technology increase, the growth in demand for banks to offer mobile banking services to its customers continue.

1.1.2 General Performance in the banking sector in Kenya

According to CBK reports (2013) the Kenyan banking sector registered an improvement in performance with the size of assets, loan and advances, deposit base and profits before tax improving. The number of bank customer deposits and loan accounts increased. The banking sector aggregate statement of financial position also expanded. Deposit base grew, the number of deposit accounts increased and capital levels and shareholders' funds increased. Profitability also increased. The components of expenses were staff costs, interest on deposits and others.

1.1.3 Mobile Phone Banking and Performance of Commercial Banks in Kenya

Mobile phone banking products in Kenya include Mshwari by CBA and Safaricom, the recently launched Equitel by Equity and Airtel, Patacash by Post bank, Hello money by Barclays, Mobibank by KCB and Pesapap by Family bank among others. Mshwari was launched in November 2012. On day one of its launch 70, 000 people subscribed for it's services. Within the first 100 days, it had 32000 new customers and one million customers in 41 days. By April 2013, 3 million customers had subscribed. The high number of registrations shows that indeed this was technically feasible and commercially viable. It is yet to be seen if the other mobile phone banking products in the market will significantly improve commercial banks performance as it has been seen with CBA'S Mshwari.

1.2 Statement of the Problem

Telecommunication companies have come up with products that are somehow similar to banks products which have made them to take up some of the market share of banks. To

guarantee survival, the banks have to act by offering higher products and services that compete with these products and joining the telecommunication companies in the game. Key players like Safaricom have dominated the mobile money market and banks need to get a share of the cake by partnering with mobile phone companies to introduce mobile phone banking. The needs of customers keep changing and banks need to adapt to these technological advancements. Also, according to CBK data (2013) the popularity of mobile phones for financial transactions is rising while the use of ATM's is falling.

Kenya is still heavily cash based, therefore, ATM use would never be eliminated but would rise modestly in the short run with an expected stagnation at some stage as direct electronic transfers become popular. The mobile money business is so serious that even competitors are feeling the "heat". According to the daily nation of Friday July 31 (2015) in an article with the title Safaricom advised to split its revenue arms, Airtel, Safaricom's competitor felt that Mpesa should be a national platform that is independent for mobile users to freely choose their network of choice as opposed to insisting that one has to use a Safaricom line to access Mpesa. In the same article, a controversial dominance regulation if passed by parliament will compel Safaricom to maintain separate books of accounts for Mpesa, Mobile phone services and Infrastructure.

Numerous related researches have been carried out. Mattilla (2002) did a research on factors affecting adoption of mobile banking services and reported that the respondents valued independent usage of mobile banking services. Based on Mattilla's findings, a model of the factors affecting adoption of mobile banking services was formed with perceived risk and external factors such as social system, time, and demographics of adapter and communication channels being the dimensions of the model. Okiro and Ndung'u (2013)

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did a study on the impact of mobile and internet banking on the performance of financial institutions in Kenya. The findings were that various challenges face mobile banking among them being slow transaction processing, service provider system delays, high cost of transactions, daily withdrawal limits and frauds.

According to the study by Donner and Tellez (2008), on mobile banking and economic development, a conclusion was that mobile banking system reminds us that in developing societies, understanding the role of mobile mediation between social and economic transactions must be sometimes included simultaneously. According to Mbiti and Well (2011) who did a study on the impact of Mpesa in Kenya, the introduction of Mpesa, a mobile money transfer system, led to considerable reduction in competitors prices. Klein and Mayer (2011) did a research on mobile banking and financial Inclusion and among the conclusions was that Mpesa usage increases the probability of being banked. Some of these studies have been done in other economies which have different operating environment from that in Kenya. Relatively little scholarly research explores the effect of mobile phone banking systems on performance of commercial banks in Kenya. This study therefore seeks to fill some knowledge gap in the research literature.

1.3 General Objective of the Study

The general objective of my research was to examine the effects of mobile phone banking on the performance of commercial banks in Kenya.

1.3.1 Specific Objectives

1) To assess the extent to which the mobile phone banking component storage of monies for safe keeping has affected performance of commercial banks in Kenya.

2)   To find out the extent to which mobile phone banking transfers has affected commercial banks performance in Kenya.

3)   To investigate the extent to which exchange of forms of monies of mobile phone banking i.e. book entry money and cash money has affected commercial banks performance in Kenya.

4)   To evaluate the extent to which the investment of mobile phone banking has affected commercial bank performance in Kenya.

1.4 Research questions

1)   To what extent has the mobile phone banking component ''storage of monies for safekeeping'' affected commercial bank performance in Kenya?

2)   To what extent has mobile phone banking transfers affected commercial bank performance in Kenya?

3)   To what extent has exchange of forms of monies of mobile phone banking affected commercial bank performance in Kenya?

4)   To what extent has the investment of mobile phone banking affected commercial bank performance in Kenya?

1.5 Justification of the Study

This research was justified by the advantages and disadvantages brought by mobile phone banking services in the financial sector, while the merits were clearly apparent to all consumers of financial services, the challenges were not apparent.

1.6 Significance of the Study

The study will be useful to the management of the banks in Kenya. The government will use the findings to develop policy guidelines to be used by banks and other financial

institutions and also mobile phone service providers. The central bank as the regulator of banks can use the research to forecast what is likely to happen in the sector and initiate laws and regulations to protect banks. Interested scholars in the field of mobile banking and bank performance can use this research as a reference point. This research will point out areas that need further investigation.

1.7 Scope of the Study

This study was limited to the relationship between mobile phone banking and their effect on the performance of commercial banks in Kenya. Performance was further limited to efficiency in cost. The study was also limited to the banking institutions in Kenya.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter addresses the theoretical framework guiding the study, empirical literature, summary of literature review, research gap and the conceptual framework.

2.2 Theoretical Review

This section reviews theories that will guide the study. The theories governing mobile banking adoption and the performance of commercial banks in their operations are mentioned. Particularly, the section looks at:

2.2.1 The Innovation Diffusions Theory

The innovation diffusions theory explains individual intentions to adopt a technology as a modality to perform a traditional activity (Okiro and Ndungu,2013). This theory was applied by Mattila (2002) when she studied factors affecting the adoption of mobile banking services. The critical factors that determine the adoption of an innovation are relative advantage, compatibility, complexity, trialability and observability. Rogers (1995). His framework provided a standard classification scheme for describing the perceived attributes of innovations in universal terms (Rogers, 1995). In the Rogers' model diffusion is studied from a change communication framework to examine the effects of all the components involved in the communication process on the rate of adoption. Rogers (1996) identified the differences both in people and in the innovation.

Diffusion is defined in the Rogers' model as a process by which an innovation is communicated through certain channels over time among the members of a social system. The definition indicates that innovation is the target, the means is communication

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channels, and communication is the process. The adopters can be an individual, groups, or organization at different levels of social system, the context of innovation is a social system and it is a change over time (Rogers, 2003). Rogers (2003) defined the rate of adoption as the relative speed with which an innovation is adopted by members of a social system.

Rogers (2003) defined relative advantage as the degree to which an innovation is perceived as being better than the idea it supersedes. Another motivation factor in the diffusion process is the compatibility attribute. In some diffusion research, relative advantage and compatibility were viewed as similar, although they are conceptually different. Rogers (2003) stated that compatibility is the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters. A lack of compatibility in IT with individual needs may negatively affect the individual's IT use (McKenzie, 2001; Sherry, 1997). If an innovation is compatible with an individual's needs, then uncertainty will decrease and the rate of adoption of the innovation will increase. Thus, what the innovation is called should be meaningful to the potential adopter. What the innovation means also should be clear. This is part of the complexity attribute.

Rogers (2003) defined complexity as the degree to which an innovation is perceived as relatively difficult to understand and use. As Rogers stated, opposite to the other attributes, complexity is negatively correlated with the rate of adoption. Thus, excessive complexity of an innovation is an important obstacle in its adoption. Another attribute of innovation is trialability. According to Rogers (2003), trialability is the degree to which an innovation may be experimented with on a limited basis. Also, trialability

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is positively correlated with the rate of adoption. The more an innovation is tried, the faster its adoption is. Reinvention may occur during the trial of the innovation then, the innovation may be changed or modified by the potential adopter. Increased reinvention may create faster adoption of the innovation. The last characteristic of innovations is observability. Rogers (2003) defined observability as the degree to which the results of an innovation are visible to others. Similar to relative advantage, compatibility and trialability, observability also is positively correlated with the rate of adoption of an innovation.

In summary, Rogers (2003) argued that innovations offering more relative advantage, compatibility, simplicity, trialability and observability will be adopted faster than other innovations. Rogers does caution, getting a new idea adopted, even when it has obvious advantages, is difficult, so the availability of all of these variables of innovations speed up the innovation diffusion process.

2.2.2 Financial Intermediation Theory

According to financial intermediation theory, financial institutions exist to mediate between the surplus and deficit units in an economy by facilitating the transfer of resources. However, this needs to be done in an economic way so as to minimize the operating costs and maximize the revenues for these banks. Financial intermediation theory brings out the role played by mobile banking in the financial intermediation process by enabling the accessibility of banking services over the mobile phone. While the modern economics theory puts into perspective the changing times and adaption to the environment.

The role of the financial intermediary is essentially seen as that of creating specialized financial commodities. These are created whenever an intermediary finds that it can sell

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them for prices which are expected to cover all costs of their production, both direct costs and opportunity costs. Financial intermediaries exist due to market imperfections. As such, in a perfect market situation, with no transaction or information costs, financial intermediaries would not exist.

Intermediation is the process whereby potential borrowers are brought together with potential lenders by a third party, the intermediary. Financial institutions, in intermediating between the surplus and the deficit units bring sustained economic development. The role of financial intermediaries includes risk reduction, aggregation, maturity transformation and financial intermediation. By lending to a wide variety of individuals and businesses, financial intermediaries reduce the risk of a single default resulting in total loss of assets. By pooling many small deposits, financial intermediaries are able to make much larger advances than would be possible for most individuals. Most borrowers wish to borrow in the short term whilst most savers are unwilling to lock up their money for the long term. Financial intermediaries, by developing a floating pool of deposits, are able to satisfy both the needs of lenders and borrowers.

Diamond and Dybvig (1983) analyse the provision of liquidity that is transformation of illiquid assets into liquid liabilities by banks. In their model identical investors or depositors are risk averse and uncertain about the timing of their future consumption need. Without an intermediary all investors are locked into illiquid long term investments that yield high pay offs to those who consume later. Financial intermediation can also be termed as a process which involves surplus units depositing funds with financial institutions who then lend to deficit units. Bisignano (1992) identified that financial intermediaries can be distinguished by four criteria. First, their main categories of liabilities or deposits are

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specified for a fixed sum which is not related to the performance of a portfolio. Second, the deposits are typically short-term and of a much shorter term than their assets. Third, a high proportion of their liabilities are cheques which can be withdrawn on demand and fourthly, their liabilities and assets are largely not transferable. The most important contribution of intermediaries is a steady flow of funds from surplus to deficit units.

2.2.3 Modern Economics Theory

The modern economic theory consist of price theory or microeconomics, macroeconomics, money and banking, international economics, public finance, economics system, economics of development and planning and economics of welfare. In the modern economy, most money takes the form of bank deposits but how the creation of bank deposits take place is often misunderstood. The main way is through the making of loans by commercial banks. Whenever a loan is made by a bank, a matching deposit is simultaneously created in the bank account of the borrower thereby new money is created.

Bank lending creates deposits, they do not only receive from savings of households and lend back. If banks are to remain profitable in the competitive banking system, they have to limit their lending. Prudential regulation constrains the bank activities in order to maintain financial system resilience. Households and companies who receive money created by new lending may take actions affecting money stock like using it to repay existing debts. The ultimate limit on money creation is monetary policy. Banks have to ensure that the ultimate limit on money creation in the economy is consistent with low and stable inflation.

Rather than containing reserve quantity, central bank implements monetary policy by setting the reserve price. In reality, banks decide how much to lend depending on the

profitable lending opportunities available to them which will depend on interest rate set by CBK. The lending decisions determine how many bank deposits are created by the banking system. Amount of bank deposits in turn influence how much CBK money banks want to hold in reserve to meet public withdrawals, make payments to other banks or meet regularly liquid requirements. Broad money is a measure of the total amounts of money held by households and companies in the economy. Broad money is made up of bank deposits. In the modern economy, those bank deposits are mostly created by commercial banks themselves. Commercial banks create money in the form of bank deposits by making new loans. For example, to someone taking out a loan to buy a house, their bank account is credited with the amount of the loan. At that moment, new money is created. The repayment of bank loans destroys money. If a consumer pays his credit card in full at the end of the month, its bank would reduce the amount of deposits in the consumer account by the value of the credit card bill thus destroying all the newly created money. Deposit creation or destruction also occurs anytime the banking sector including the CBK buys or sells existing assets for example banks buying and selling government bonds. In the modern economy, there are three main sets of constraints that restrict the amount of money that banks can create.

Firstly, banks themselves face limits on how much they can lend. Individual banks have to lend profitably in a competitive environment. Money creation is also constrained by the behavior of the money holders, households and businesses, households and companies receiving newly created money might respond by destroying the money immediately through repayment of existing loans. The ultimate constraint on money creation is monetary policy. Mobile companies in Kenya started offering products which

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somehow compete with products of banks in Kenya. It is the work of the central bank of Kenya to create prudential guidelines and to regulate the services. For example, the money from customers' deposits is kept in a separate account. Part of the market share of banks has been taken up through transaction fees on Mpesa and commission based services like Mshwari and Mbenki. However, this is good news since it builds Kenya's economy.

2.3 Theoretical discussion of Independent and Dependant Variables

This section discusses the variables that the study is made up of. It explains each of the four independent variables and the dependant variable.

2.3.1 Storage of Monies for Safe Keeping

Traditionally, individuals kept monies safe by keeping it in a hidden place and guarding it. Modern systems of finance delegate safe keeping through a safe deposit box. Safe keeping can be delegated through opening an account in a bank or a non bank such as Mpesa. This facilitates investing and transferring of monies in that the customer can transfer monies directly from his or her Mpesa account to his/her bank account for safekeeping and investment purposes. Records are created to establish who owns the account and how gaining of access to the account takes place. Banks and non banks have rules and regulations governing them. The government also implements policy to regulate them. Account information is kept in backups in case of theft or destruction. Mpesa keeps depositors money separate from the telecommunication companies' account. This is necessary for safeguarding purposes. Cash merchants carry out account registration (Klein and Mayer, 2011).

Safaricom is not authorized to operate as banks neither are other telecommunication companies in Kenya. The money circulated on Mpesa is deposited at

the Commercial Bank of Africa in a physical bank Account. CBA monitors Mpesa daily transactions. Transactions are made or carried out by use of virtual information (Omwansa, 2009). He further asserts that moving around with cash though unsafe is convenient and suggests the option of current accounts as safe though not convenient especially where access to bank branches is limited. When one walks around with their virtual money, they can withdraw cash anytime at a minimal fee. In addition, no one can access a stolen mobile phone without the correct Personal Identification Number or PIN. Mpesa therefore provides both convenience and safety (Omwansa, 2009)

Storage of monies for safe keeping and depositing of monies are different terms that can be used interchangeably because of their similarities. When one deposits money with Mpesa or with a bank, the Agent or bank keeps the physical monies in exchange for virtual information or as a credit entry in the customer's account if it is a bank. The monies are therefore stored and kept safe. Mobile phones can be used to store values in an account linked to a handset (Donner and Tellez, 2013). According to Donner and Tellez, (2013) M-banking and M-payment systems enable users to store value/currency in an account accessible via the handset. Secondly, mobile phones can be used to convert cash in and out of the stored value account and thirdly mobile phones can be used to transfer stored value between accounts.

A set of SMS messages, menu commands and pin commands are usually used (Donner and Tellez, 2013). The act of depositing monies through the phone offers convenience to the customer. Mobile phone banking is a relatively new technology with storage of monies for safekeeping being one of the mobile banking components. In mobile phone banking, adopters are the banks and the customers in that the banks will

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offer the products and the customers will choose whether or not to consume it. The banks adopt in order to store and keep the monies safe while customers adopt due to convenience. If an innovation is compatible with individual needs, uncertainty decreases and the rate of adoption increase (Rogers, 2003).

2.3.2 Transferring monies

Traditional ways of transporting money were walking or running long distances and delivering and giving to friends and relatives or to bus drivers . Modern ways that came up include credit transfers, western union, swift, check clearing system and the latest being mobile money technology. According to Omwansa (2009), several forms of payments can be done using mobile phone systems for instance paying school fees, sending pocket money , paying for consumables, making informal loan repayments, submitting contributions in funds drives, paying public transport and keeping money safe in a virtual checking account. All this forms of payments involve transferring monies from one owner to another. When one receives book entry money via Mpesa, one does not need to travel a long distance to withdraw the monies (Omwansa 2009). Mpesa agents are within reasonable distance of many schools, homes and are also located in some supermarkets.

According to Klein and Mayer (2011) the issue is reliability and integrity of the transport mechanism. Specific financial regulation is not required for the movement of money across physical distance, however when money is moved across national borders, there is concern because local currency may be exchanged into foreign currency. The by passing of a bank clearing system is a fundamental advantage of a modern payments system (Klein and Mayer, 2011). Mobile payment systems offers a way of moving money

from place to place and present an alternative to the payment system offered by banks like western union, money gram and swift transfers. One of the challenges of this component of transferring monies from one owner to another is that it may be a little bit complex for first time users. Rogers (2003) proposes attributes of innovation which decrease uncertainty about the innovation. One of the attributes is complexity. According to Rogers 2003, complexity is defined as the degree to which an innovation is perceived as relatively difficult to understand and use. Complexity is negatively correlated with the rate of adoption. Thus complexity of an innovation is an obstacle in its adoption. Banks in Kenya have helpdesks, hotlines and customer service representatives to assist in case customers experience difficulties when carrying out mobile banking transactions/transfers.

2.3.3 Exchanging forms of monies

In mobile banking, the categories of monies are book entry money (BEM) or Cash money. Exchanges of forms of money can be compared to Deposits and withdrawals in modern day banking. A deposit is a sum of money placed or kept in a bank account, usually to gain interest. Users make their transactions using virtual information. When a user wants to withdraw cash, he or she goes to an agent authorized to keep cash and can give them the equivalent monies for the electronic values they transmit to the agent (Omwansa, 2009). Agents accept deposits and load them into a customer's mobile account, the customer can then deposit directly into his or her bank using the Mpesa paybill functionality. Agents can also serve as points for withdrawing cash whereby the customer first withdraws from his or her bank account to Mpesa and then from Mpesa to physical cash.

When a customer performs a mobile banking transaction, the parties concerned get confirmation of the transfer from the service provider in this case the telecommunication company. Mobile money schemes in Kenya include Mpesa, Orange money, Airtel money and Mobikash among others. The contractual relationships could be between customer and cash merchant, between merchant and wholesaler and between merchant, wholesaler and service provider (Klein and Mayer 2011).

According to Donner and Telez, (2008).The aspect of exchanging forms of money is referred to as converting cash in and out of the stored value account. Upon comparing this component of mobile banking to the innovation diffusions theory, it can be seen that it has almost all the characteristics described by (Rogers, 2003). The innovations diffusions theory is developed by Rogers (1983). The critical factors that determine the adoption of an innovation are relative advantage, compatibility, complexity, trial ability and observation ability. The theory explains individual intentions to adopt a technology as a modality to perform a traditional activity Rogers (1995).

When an innovation is new, it is first tried and tested. When the pilot test succeeds, it is released into the market. According to Rogers (2003), trial ability is the degree to which an innovation may be experimented with on a limited basis. Trial ability is positively correlated with the rate of adoption. The more an innovation is tried, the faster its adoption. Mobile banking is a reinvention from mobile money. Reinvention occurs during the trial of an innovation. The users in this case the customers are the ones to be involved in the trial. The different forms of money can be seen as shown by the text messages on their handsets after use of various commands and passwords. According to Guitterez and Singh, (2013), the model of providing financial services through a mobile phone linked to a bank account is referred to as the additive

model. On the contrary, when non banks issue electronic currency to offer customers payment services, this is referred to as transformative model (Guitterez and Ssingh, 2013). Depending on the contractual relationships, both the additive model and transformative model can be seen through this component of mobile banking.

2.3.4 Mobile banking Component of Investing Monies

According to Orina (2011) capital budgeting which investment falls under is the planning process used to determine whether a firms long term investments are worth pursuing. Formal methods used in capital budgeting are payback period, accounting rate of return, net present value techniques, profitability index and internal rate of return (Orina,2011).A cost benefit analysis is usually carried out in investment appraisal. If the benefits outweigh the costs, then the project is viable. Banks need to partner with mobile phone companies in order to reduce their operating costs, to be efficient in service delivery and to share in the profits of this new and rapidly growing technology. The decisions to venture into these partnerships show that indeed mobile phone banking is commercially feasible and economically viable.

Technology and innovation often catch on ahead of regulation. In Kenya, in the year 2007, nearly two million users were registered with Safaricom's Mpesa system within a year of its nationwide rollout (Ivatury and Mas, 2008; Vaughan, 2007; Donner and Tellez 2011). These were huge numbers which banks could not afford to ignore. Actually, when Mpesa started, Safaricom only agreed to partner in the project. The innovation began at Vodafone, Safaricom's parent company in the UK (Omwansa (2011).Other partners were Faulu Kenya, a leading microfinance institution and the Commercial Bank of Africa (CBA) which provided the traditional banking infrastructure. The aim of this project was to improve financial services to people in East Africa. Sokotele was later launched by Celtel, now Airtell where they partnered

with K-Rep bank. According to Omwansa (2011) several banks have embraced mobile banking technologies enabling customers to access their bank accounts via mobile phones.

By investing Mpesa net balances in a bank, Banks benefit. The CBK has asked Safaricom to diversify investment by depositing Mpesa monies in two banks (Mayer and Klein, 2011) and has decreed that the interest be paid to charity. Mshwari loan services is benefitting Commercial bank of Africa, thus it's an investment. When customers deposit through mobile banking, the bank deposits grow thus enhancing investments. When bank customers withdraw their monies held in the bank through the phone, banks earn income in the form of withdrawal fees.

Mpesa acts mainly as a conduit of deposits for banks and is subject to the prudential rule, namely to invest money only in safe instruments in a somewhat diversified set of regulated banks. The birth of mobile money in Kenya was a clear indication of investments avenues. This can be easily observed by the number of customers registering for mobile money services every day. No wonder banks have also developed an interest in this area. This can easily be seen thus fulfilling the characteristic of observability in innovation diffusion. According to Rogers, (2003) observability is the degree to which the results of an innovation are visible to others. Observability is positively correlated to the rate of adoption of an innovation.

2.3.5 Performance Direction

Barney (1997) recognizes controversy on different opinions of performance among organizational researchers. Moullin (2008) equates performance to the economic efficiency and effectiveness of an activity. Similarly, Daft (2007) recognizes efficiency and effectiveness as a performance indicator as an organization strives to achieve its goals. None the less, he puts more emphasis on the result, achievement of set goals. Richardo (2009) simplifies performance as the

ability of an organization to achieve its goals and objectives and tends to ignore the how efficiency and effectiveness of the process.

Ricardo (2009) further identifies various concepts as key performance measures. These measures include result oriented behavior and relative measures, education and training, concepts and instruments, management development and leadership training. He points out these concepts as the necessary skills and attitudes of performance management. To this end, performance assumes both a qualitative and a quantitative shape. In this study performance will take the direction of cost efficiency. Rumble (1997) defines efficiency as the ratio of output to input.

Performance measurement in this study aims to establish how well banks are doing in relation to mobile phone banking technology. Responsibility Accounting is a term used to describe decentralization of authority with the performance of decentralized units measured in terms of accounting results. With a system of responsibility accounting there are three types of responsibility centers: cost centre, profit centre and investment centre. This study will focus on cost centre. Cost accounting is that part of management accounting which establishes budgets and standard costs and actual costs of operations, processes, departments or products and the analysis of variances, profitability and social use of funds. In a cost centre, the manager has control over controllable costs where the principal performance measures are variance analysis and efficiency measures. The difference between an actual result and an expected result is a variance. When total difference between standard and actual results is analyzed, the process is called variance analysis.

2.4 Empirical Review

This section discusses past research findings and studies related to the topic '' effect of mobile phone banking on performance of commercial banks in Kenya.''

2.4.1 Related Studies in Developing Economies

Several studies have also been conducted, Al-Jabri, (2012) studied mobile banking adoption by looking at the application of diffusion of innovation theory. This study sought to investigate a set of technical attributes and how they influence mobile banking adoption in a developing nation, like Saudi Arabia. The study used diffusion of innovation as a base-line theory to investigate factors that may influence mobile banking adoption and use. More specifically, the objective of this research was to examine the potential facilitators and inhibitors of mobile banking adoption.

The study was guided by six hypothesis including: relative advantage having a positive effect on mobile banking adoption; Complexity having a negative effect on mobile banking adoption; Compatibility having a positive effect on mobile banking adoption; Observability having a positive effect on mobile banking adoption; Trialability having a positive effect on mobile banking adoption; and perceived risk having a negative effect on mobile banking adoption. The findings suggest that banks, in Saudi Arabia, should offer mobile banking services that are compatible with various current user requirements, past experiences, lifestyle and beliefs in order to fulfill customer expectations. With better mobile banking support and provision of variety of services, the more useful customers perceive mobile banking to be and to increase their level of adoption. Hence, bank's attention should focus on understanding customer behavior and designing reliable mobile banking systems that will meet their needs and provide useful and quality services. In addition, banks should focus on communicating information that emphasizes

the relative advantage and usefulness of mobile banking compared to other banking channels like physical presence to the bank or using ATM machines.

Banks must seek to reduce risk perceived by their customers by offering specific guarantees protecting them and taking their complaints seriously and urgently. Kigen (2010) studied the impact of mobile banking on transaction costs of microfinance institutions where he found out that by then, mobile banking had reduced transaction costs considerably though they were not directly felt by the banks because of the then small mobile banking customer base. Kigen (2010) sought to determine the impact that mobile banking bore on transactional costs of microfinance institutions. Wambari (2009) studied mobile banking in developing countries using a case of Kenya.

This study sought to establish the importance of mobile banking in the day to day running of small businesses in Kenya and to understand the challenges involved in using m-banking as a business tool and appreciate the advantages and disadvantages therein. This study elaborated that the adoption and use of mobile phones is a product of a social process, embedded in social practices such as SMEs Practices which leads to some economic benefits.

According to Koivu (2002), the uptake of mobile phone in Kenya has been unprecedented. Mobile banking in Kenya affects performance of organization behavior and decision making of the entire economy. The trend of continued reliance on mobile devices to execute monetary transaction is steadily gaining momentum. Mobile banking is one innovation which has progressively rendered itself in pervasive ways of cutting across numerous sectors of economy and industry. Zimmerman (2010) discovered that mobile banking in the developing world was an object of skepticism among financial insiders. While proponents argued that cell phones could revolutionize personal finance in poorer countries, regulators warned of money

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laundering and most bankers worried that low customer balances wouldn't be worth transaction costs. Ching et al (2011) studied the factors affecting Malaysian mobile banking adoption from the point of an empirical analysis.

This study aimed at extending the Technology Acceptance Model (TAM) to investigate mobile banking acceptance in Malaysia. More specifically, the objective of this study was to examine the relationships between constructs of perceived usefulness, perceived ease of use, social norms, perceived risks, perceived innovativeness, and perceived relative advantages towards behavioral intention in adopting mobile banking. The findings of this study revealed that perceived usefulness, perceived ease of use, relative advantages, perceived risks and personal innovativeness were the factors affecting the behavioral intention of mobile users to adopt mobile banking services in Malaysia. Meanwhile, the social norms were the only factor found to be insignificant in this study. Munaye (2009) studied the application of mobile banking as a strategic response by equity bank Kenya limited to the challenge in the external environment. Munaye (2009) reviewed the concept of mobile banking as a strategic response where its effects on financial performance were not considered. Tiwari, Buse and Herstatt (2006) studied mobile banking as business strategy: impact of mobile technologies on customer behavior and its implications for banks.

The study sought to examine the opportunities for banks to generate revenues by offering value added; innovative mobile financial services while retaining and even extending their base of technology-savvy customers. Kingoo (2011) studied the relationship between electronic banking and financial performance of commercial banks in Kenya where he paid keen attention on the microfinance Institutions in Nairobi. He looked at the wider electronic banking whereas this study will only concentrate on mobile phone banking.

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Tchouassi (2012) sought to find out whether mobile phones really work to extend banking services to the unbanked using empirical lessons from selected sub- Saharan Africa countries. This study sought to discuss how mobile phones could be used to extend banking services to the unbanked, poor and vulnerable population. The study noted that poor, vulnerable and low-income households in Sub-Saharan Africa (SSA) countries often lacked access to bank accounts and faced high costs for conducting basic financial transactions. The mobile phone presented a great opportunity for the provision of financial services to the unbanked. In addition to technological and economic innovation, policy and regulatory innovation was needed to make these services a reality.

Donner and Tellez (2008) did a study on mobile banking and economic development where they sought to link adoption, impact, and use. The study established that through offering a way to lower the costs of moving money from place to place and offering a way to bring more users into contact with formal financial systems, M-banking/M-payments systems could prove to be an important innovation for the developing world. However, the true measure of that importance required multiple studies using multiple methodologies and multiple theoretical perspectives before answering the questions about adoption and impact.

2.4.2 Related Studies in Developed Economies

Mattilla (2002) did a research on factors affecting adoption of mobile banking services and applied the innovation diffusions theory. In her study, she asserts that demanding and knowledgeable customers assume that providers of banking service acting in an environment that is technologically driven will continue keeping up with development, apply further technological innovation in service offerings and ease up lives of customers.

McGregor (2013) did a study titled Mobile banking: Increasing Access to Financial services. Her research analyzed how this technology helps unbanked and under banked populations decrease financial risk and gain entry to more secure financial services. The results in this thesis indicated that consumers could increasingly turn to mobile phones to meet personal financial needs when banking services are not generally available. This is referred by Klein and Mayer (2011) as the transformative model. In the same study, titled mobile banking and financial inclusion, the importance of mobile banking is indicated as threefold: Firstly, providing financial services in locations without banks. Secondly, it raises important regulatory and competition policy issues and thirdly, by splitting and separating financial services into its component parts, it gives important conceptual insights into the nature of financial services.

2.5 Research Gap

Some of these studies have been done in other economies which have different operating environment from that in Kenya. Relatively little scholarly research explores the effect of mobile phone banking systems on performance of banks in a developing country. This study therefore seeks to fill some knowledge gap in the research literature.

2.6 Summary of Literature Review

This chapter looked at the theoretical framework where it discussed the theories on which the study is found: Innovation diffusions theory, financial intermediation theory and modern economics theory. It further provided literature on the four objectives which also are also the components of mobile banking transactions. It also defined performance using the definition of various scholars and mentioned the direction which performance will take. Lastly, it looked at empirical review where it discussed previous related studies done by different scholars in Africa and Europe.

2.7 Conceptual Framework

The conceptual framework assessed the research variables derived from literature to test whether there are significant   relationships between the independent variables and the dependant variables.

FIGURE I

Conceptual Framework Model

Independent Variables   **Dependent Variable**

| Storage of monies for safe keeping |

| Transfer of monies from one owner to another |

| Exchanging forms of monies |

| Investment of monies |

| Performance- Efficiency in cost |
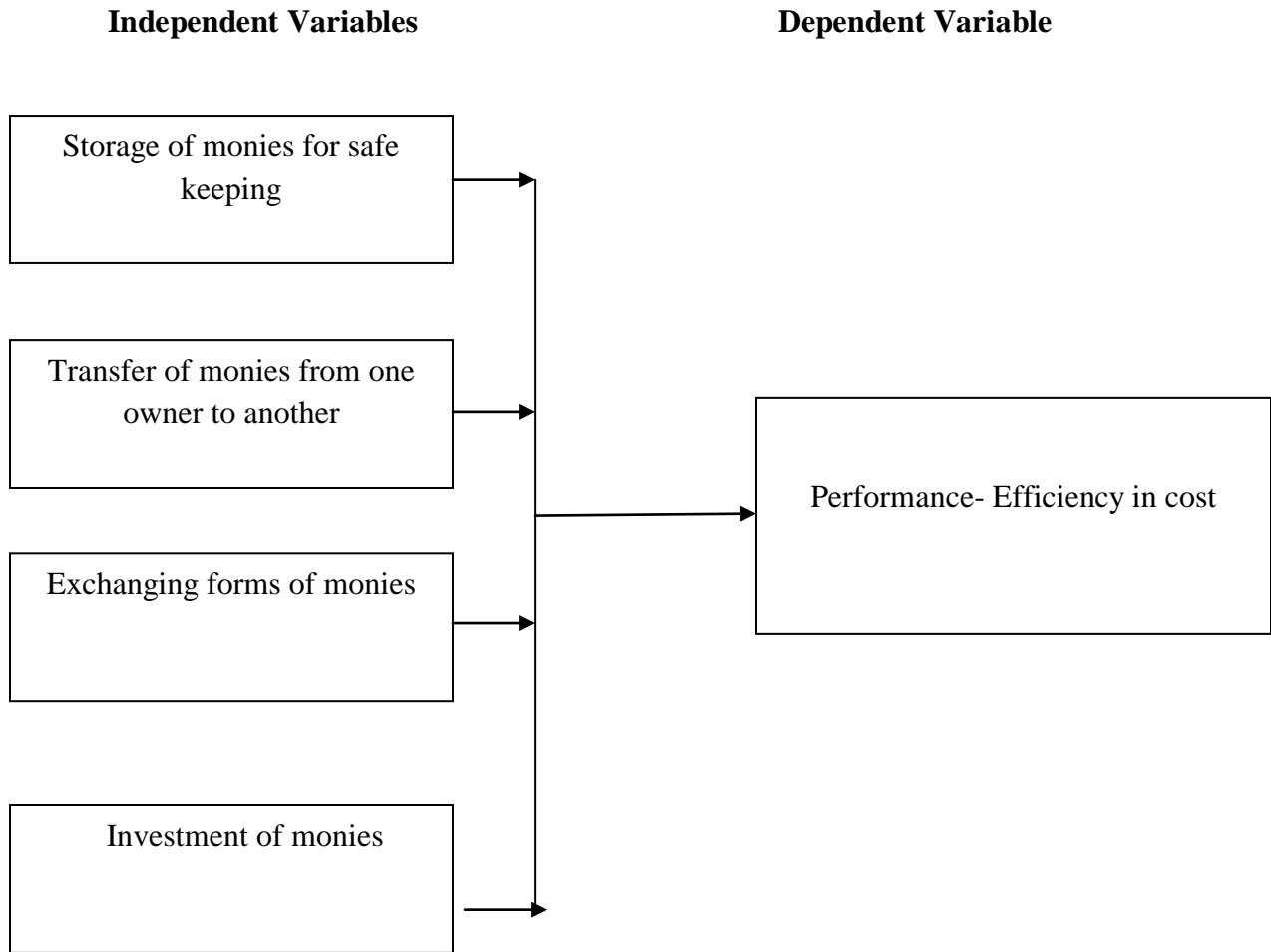
2.8 Operationalization of Variables

Table 1 below presents how the variables will be operationalized.

TABLE 1
Operationalization of Variables

Variable	Indicator	Measurement	Question
Storage of Monies for safe keeping	• Efficiency and effectiveness in costs • Social use of funds.	-Likert scales 1 - 5	1 to 8
Transfer of Monies from one owner to another	• Efficiency in costs of operations and processes.	-Likert Scales 1 -5	1 to 9
Exchanging Forms of Monies.	• Cost efficiency.	-Likert Scales 1-5	1 to 6
Investment of Monies	• Profitability.	-Likert Scales 1-5	1 to 7
Performance	• Analysis of Variances. • Establishment of budgets, standard costs and actual costs of operations, processes, departments and products.	-Likert Scales 1-5	1 to 11

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presented a description of the research methodology which was used in the study. It included various sources of data and target population. It covered the research design, sampling frame, sampling methods, sampling technique, sampling procedures, data collection methods and techniques and data collection instruments and procedures which were used in addressing the study objectives. It set out various stages and phases that were followed in completing the study.

3.2 Research Design

The study will adopt a descriptive research method. Descriptive Research Design according to Kothari (2004)   is one that seeks to explain the particular characteristics of an individual, group or a phenomenon. It describes the special features attributable to a particular phenomenon and concerns special predictions with specific narration of facts regarding the phenomenon. A clear definition of the problem must therefore be stated so that appropriate measurement tools and techniques are identified to be used in the study. Descriptive research can also be described as the process of collecting data in order to test the hypothesis or answer questions concerning the current status of the object in study.

Descriptive research design is more appropriate because the study seeks to build a profile about the effect of mobile phone banking on the performance of commercial banks in Kenya. This study design was used to obtain current status of the phenomena and describe what exists with respect to variable. A   descriptive study was preferred to simple data as the researcher was able to investigate the relationship between two or more variables.

3.3 Target Population

Target population is the population to which a researcher wants to generalize the results of a study. Mugenda and Mugenda (2003) describe a population as a complete set of individuals, cases or objects with some common observable characteristics. It is that which conforms to a given selected specification. A population can also be defined as a set of people, services, elements, and events, groups of things or households that are being investigated.

As at 31st December 2014, the banking sector comprised of the Central Bank of Kenya, as the regulatory authority, forty three banking institutions , seven representative offices of foreign banks, eight Deposit-Taking Microfinance Institutions (DTMs),one mortgage finance company, one hundred and eight Forex Bureaus and two Credit Reference Bureaus (CRBs) (CBK, 2014). The target population in this study will consist of the 43 Commercial banks operating in Kenya as at 31ST December 2014.A population is considered to be normally distributed or statistically significant when n>30% (Mugenda and Mugenda,2004).The population is therefore right for the study since n is greater than 30%.Also, according to Bank supervision annual report (2014) the total number of bank employees in 2013 was 34059. The number of employees in the banks that were randomly selected for this study were 18000 employees. This comprises approximately 53% of the total population. Out of the 18000 employees of the selected banks in my study, 10800 employees were stationed within Nairobi offices. This comprises 60 % of the total population stationed within Nairobi. Out of those stationed within Nairobi, 1213 are stationed at the headquarters. The study was conducted within Nairobi where a research sample of 200 employees who form approximately 17 per cent of this accessible population was arrived at. An accessible population of 1213 was therefore used to be representative of the global population which is assumed to constitute of similar elements.

3.4 Samples and Sampling Procedure

Purposive sampling technique was adopted since only 10 out of the 43 commercial banks operating in Kenya were   selected. Purposive sampling is where the researcher makes a deliberate judgment on where to collect his or her data. Purposive sampling, also known as judgmental, selective or subjective sampling, is also a type of non-probability sampling technique. Non probability sampling focuses on sampling techniques where the units that are investigated are based on the judgment of the researcher. The justification for purposively choosing the 10 banks was because the size (10) is a manageable number and all of them are accessible either physically or through their email addresses. The sample of 23 % of the population that is (10) out of (43) multiplied by 100 per cent for this study was drawn from selected financial Institutions as illustrated in the table below. The sample of 23 % was adopted because it was representative and it gave accurate results. Sampling methods that were used included stratified random sampling.

3.5 Sample Distribution

TABLE 2

Sample Distribution

SYMBOL	FINANCIAL INSTITUTION	SAMPLE SIZE	PERCENTAGE %
BBK	Barclays Bank of Kenya	20	10
CBA	Commercial Bank of Africa	20	10
DTB	Diamond Trust Bank group	20	10
EQTY	Equity Bank group	20	10
HFCK	Housing Finance company of Kenya	20	10
NIC	National Industrial Credit Bank	20	10
KCB	Kenya Commercial Bank Group	20	10
NBK	National Bank of Kenya	20	10
SCBK	Standard Chartered Bank of Kenya	20	10
CO-OP	Cooperative Bank of Kenya	20	10
TOTAL		200	100

3.6 Instrumentation and Data Collection

Questionnaires were used for the study. In this study, closed ended questionnaires were used. The questionnaires were administered to a stratified sample of bank employees and were delivered to the respondent bank by the researcher by drop and pick later method. In each bank, 20 questionnaires were administered. Kenya has 43 registered commercial banks. These banks have branches in Nairobi. Further, the banks have several departments like ICT, Human

resources, Credit control, Marketing, Operations, Legal and Finance. For the purpose of this study, the researcher used stratified and purposeful method to select two departments which were Finance and Operations. The choice of finance department is advised by the fact that it is in charge of financial statements preparation and therefore the most knowledgeable in this field.

The Operations department was selected because these are the users of mobile banking and the people in direct contact with customers. A total of 200 questionnaires were distributed. Primary data was collected. Primary data refers to the information a researcher obtains from the field. The primary data collected was classified as quantitative or numerical and qualitative. To discover the effects of mobile phone baking on performance of commercial banks in Kenya, factor analysis was employed. The data collection tool was divided into six sections labeled alphabetically. The first section consisted of general questions, the second, third, fourth and fifth sections consisted of closed ended questions and related to all the independent variables. The sixth section also consisting of closed ended questions related to the dependant variable. There was also space for respondents to give their opinion on anything related to the topic not covered by the data collection tool.

3.7 Pretesting the Research Questionnaire

The questionnaires were administered to five commercial banks in Kenya randomly sampled from the list in Appendix I. Four copies of the questionnaire were distributed per financial institution to provide the assessment. The respondents were free to make comments on the questionnaire concerning difficult wording, limited options or missing options. The 20 respondents used for pretesting did not participate in the main study.

3.8 Validity and Reliability

Bechtold (1959) defined validity as the extent to which an instrument measures what it purports to measure. Content validity is the key type of validity for this study. Content validity focuses on the degree to which the instrument fully assesses or measures the construct of interest. To measure validity, each of the pretest respondents rated the questionnaire on a scale of 1 to 5 where 5   showed the level of agreement with the factor in question. The   respondents were free to make comments on the questionnaire concerning difficult wording, limited option or missing options. Reliability on the other hand is a measure of the extent to which a data measuring instrument relays consistent results over several trials. The Cronbach's alpha (α) test which is an extension of Kuder-Richardson Formula (KR-20) test was used to test reliability of the instruments. An alpha coefficient greater than 0.7 ($\alpha > 0.7$) should lead to the acceptance of the instrument hence or   otherwise rejected. Kent (2001).

A high α coefficient according to Mugenda & Mugenda (2003) implies that there is homogeneity of data. A low coefficient means there is no homogeneity which implies that the instrument being used for the study is not quite suitable for the job.

TABLE 3

The Cronbach Alpha coefficient interpretation of results

Cronbach's alpha coefficient(α)	Internal consistency
$\alpha \geq 0.9$	Excellent
$0.9 > \alpha \geq 0.8$	Good
$0.8 > \alpha \geq 0.7$	Acceptable
$0.7 > \alpha \geq 0.6$	Questionable
$0.6 > \alpha \geq 0.5$	Poor
$0.5 > \alpha$	Unacceptable

Source: Kent (2001) pp 222

3.9 Data Analysis and Presentation

A qualitative analysis of the likert responses from the questionnaire was done using the mean and standard deviation to determine the extent to which each of the variables affect the performance to the responding banks and then tabulated. For each of the banks, the equally weighted average mean of the likert response for each of the variables was found. Multiple regression analysis was used to analyze the data. This model was used by Kimani (2012).The multiple regression equation was of the form;

$$Y = \beta_0 + \beta_i X_i + \beta_{ii} X_{ii} + \beta_{iii} X_{iii} + \beta_{iv} X_{iv} + \varepsilon \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (i)$$

Where,

Regression equation explanation.

$Y =$	Performance of banks in Kenya.
β_0	Constant term
β	Sensitivity of Y to variable X_1, X_2, X_3, X_4
X_i	Storage of monies for safe keeping variable
X_{ii}	Transfer of monies from one owner to another variable
X_{iii}	Exchange of forms of money i.e. book entry money to cash money and vice versa.
X_{iv}	Investment of monies Variable.
ε	The error term

The t-test at 95 % confidence level was used to test the statistical significance of the regression constants C and $\beta_i, i = 1, 2, 3.$ The F-test at 95 % confidence level was used to determine whether

the regression relationship between the dependent and the independent variables is a statistically significant strong relationship between the variables. This test helped to test whether there is a strong relationship between mobile phone banking and performance of the commercial banks. The coefficient of determination R^2 and the adjusted R^2 was used to determine the level of strength at which the variation in the independent variables explains the variation in the dependent variable. Analysis was done using SPSS 21.

To test for the strength of the model and the effects of mobile phone banking on the performance of commercial banks in Kenya, the researcher conducted an Analysis of Variance (ANOVA). On extracting the ANOVA statistics, the researcher looked at the significance value. The study was tested at 95% confidence level and 5% significant level. If the significance number is found to be less than the critical value, then the conclusion is that the model is significant in explaining the relationship.

CHAPTER FOUR

DATA ANALYSIS AND FINDINGS OF THE RESULTS

4.1 Introduction

This chapter provides an in-depth analysis of the research findings of the study. It details the analysis of storage of monies for safe keeping variable, transfer of monies from one owner to another variable, exchanging of forms of monies variable that is book entry money and cash money, investment of monies variable and performance variable focusing on efficiency in cost. The main study involved the administration of questionnaires to 180 respondents working in the banking sector. Primary data was gathered from the questionnaires. The chapter ends with investigating whether the independent variables, namely, storage of monies for safekeeping, transfer of monies from one owner to another, exchange of forms of monies and investment of monies have any effect on performance of Commercial banks in Kenya.

4.2 Response Rate

The study sought to gather information from employees of finance and operations departments among 10 randomly selected commercial banks in Kenya. The research was designed to gather information from 200 respondents.

Out of the 180 questionnaires sent out in the final study, 145 were correctly filled and returned, 17 were rejected because they were incomplete and 18 were not returned. This implies that the 145 respondents whom data was obtained from represented 80.55. % of the total respondents.

Mugenda and Mugenda (2003) stipulate that a 50% response rate is adequate, 60% is good and 70% and above is rated very good. Based on this assertion, the response rate was very good.

TABLE 2
Response Rate

	Questionnaires Administered	Questionnaires Correctly Filled and returned	Percentage of successful response
Respondents	180	145	80.55%

4.3 Data Reliability and Pilot test results.

To test the reliability of the data collection instruments prior to the research, the researcher conducted a pilot study on a pilot unit composed of 20 respondents who would not be included on the final study. This enabled the researcher to make any necessary changes that would facilitate the selection of effective and efficient data collection instruments. Based on the Cronbach alpha coefficients obtained in the pilot study as shown in table 5, it was sufficient to conclude that the instruments used for data collection sufficiently measured the variables under study.

Construct validity was ensured using factor analysis. Reliability of the instruments on multiple items variables (e.g. storage of monies for safe keeping, transfer of monies from one owner to another, exchange of forms of monies, investment of monies and performance were tested using the Cronbach Alpha (α).The higher the value, the higher the level of reliability of the instrument. Cooper& Schindler (2008) indicated that an alpha value of at least 0.7 is reliable.

TABLE 5

Cronbach Alpha

	N	Cronbach Alpha (α)
Storage of monies for safe keeping	5	0.82
Transfer of monies from one owner to another	5	0.85
Exchange of forms of monies	5	0.78
Investment of monies	5	0.83
Performance	5	0.88

From table 5 above, the data instrument was therefore reasonably acceptable as depicted by Cronbach Alpha (α) values that were more than 0.7

4.4 Descriptive Statistics

After testing the reliability of the research instruments, the next part of the data analysis began by giving the descriptive statistics as shown below.

4.4.1 General Information

In this section, data is represented in graphs and tables. The level of education and position of the Individuals in the organization are explained. It also shows in tabular format the availability of mobile banking services and products in the commercial banks in Kenya.

FIGURE 2

Level of Education
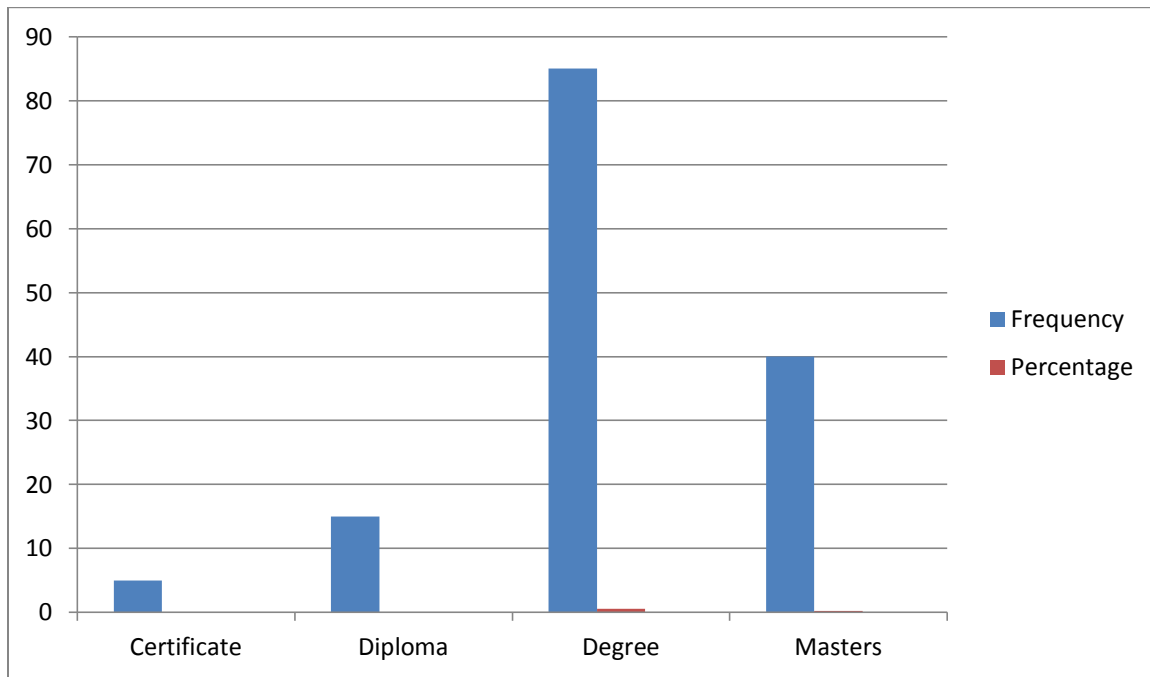
Source: Respondents data analysis

As it can be seen from   the graph above, majority of the respondents, that is 85% had acquired undergraduate education and only 5% of   the total respondents had college certificate education. This shows that the majority of the respondents had an idea of what mobile phone banking entailed.

FIGURE 3

Position in Organization
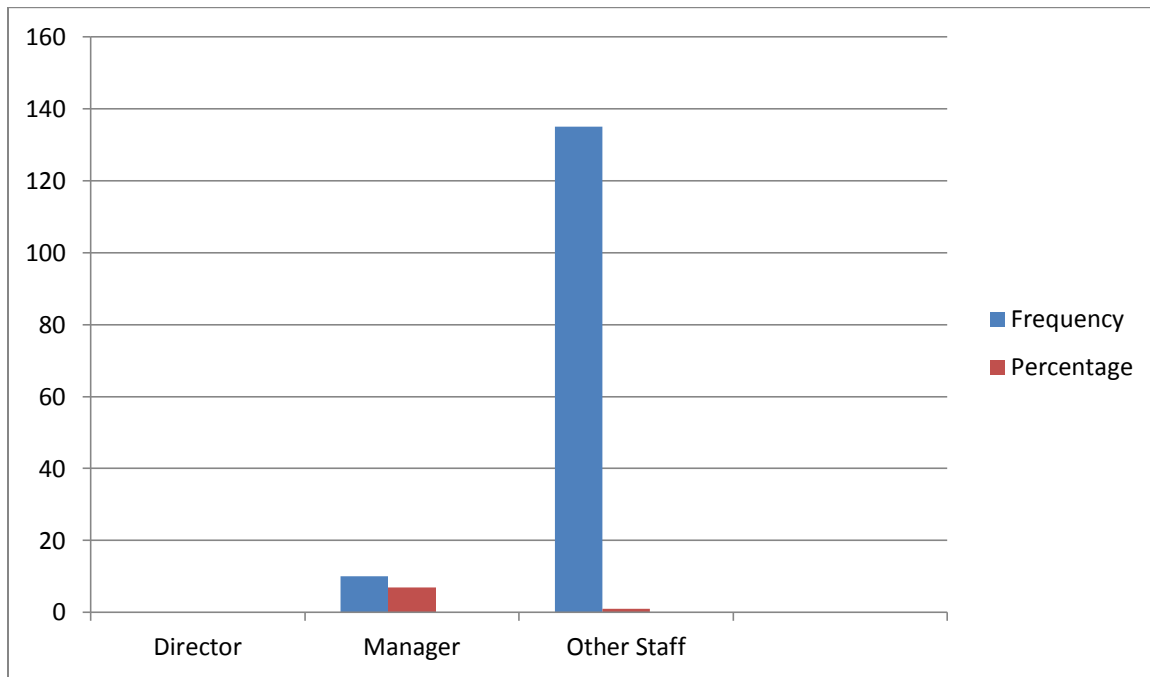
Source: Respondents data analysis

Referring to the graph above, 93% of the respondents consisted of other staff where else 7% were the managers. This indicated that a good percentage of respondents were those who deal directly with mobile phone banking clients.

TABLE 6

Availability of Mobile Banking Services/Products

	Frequency	Percentage
Yes	145	100%
No	0	0%
Total	145	100%

Source: Respondents data analysis

Referring to the table above, all the banks in the survey indicated that they offer mobile phone banking services to their clients. This indicates that the technology of mobile phone banking is growing at a high rate in Kenya.

4.5 Findings of results of Descriptive statistics.

This section discusses the results for the descriptive statistics of mean, frequency and standard deviation for the dependent and each of the independent variables.

4.5.1 Storage of Monies for safekeeping

Since in arriving at the means, we get decimals, a key for interpretation of means was created. The mean range was between 1 to 5 and the lowest range being between 1 to 1.80 with the response mode indicator being not at all and the interpretation indicator being very low. It was followed by a mean range of between 1.81 to 2.60 with the response mode indicator being to a little extent and the interpretation indicator being low. Third last on the key for interpretation of means was a range of between 2.61 to 3.40 with the response mode indicator being to a moderate extent and the interpretation indicator being moderate.

The second highest on the key for interpretation of means was a range of between 3.41 to 4.20 with the response mode indicator being to a great extent and the interpretation indicator being high. The highest on the key for interpretation of means was a range of between 4.21 to 5.00; the response mode indicator being very great extent and the interpretation indicator being very high. This is shown in table 7 as follows.

TABLE 7

Key for interpretation of means

Mean range	Response mode	Interpretation
4.21-5.00	very great extent	Very high
3.41-4.20	great extent	High
2.61–3.40	moderate extent	moderate
1.81-2.60	little extent	low
1.00-1.80	not at all	very low

The respondents were asked to indicate their level of agreement that the factors in sections B to E of the questionnaire affected the performance of the Commercial banks in Kenya. The last table, that is section F of the questionnaire required the respondent to rate their performance based on the eleven dimensions listed in it. A five point Likert scale was used in which 1 was = not at all, 2 = little extent, 3 = Moderate extent, 4 = Great extent and 5 = very great extent.

As shown in Table 8, the banks generally indicated that storage of monies for safe keeping affected their performance to a moderate extent with an average mean (M = 3.766) among the eight elements in the questionnaire, the item in storage of monies for safe keeping with the highest impact on performance was account opening is easier with mobile banking with a standard deviation (S = 0.744) and a mean (M = 3.972) which showed a high level on the likert scale interpretation.

It was followed by the factor stating that internal financial policies strictly observe conditions set by the CBK that produced a standard deviation (S = 0.716) and a mean (M =

3.959) great extent level of interpretation on the likert scale, third highest means among the factors was record keeping is better (M =3.834) and a standard deviation (S = 0.745), fourthly there is increased liquidity position (M=3.766) and (S = 0.791),fifthly non introduction of mobile banking products affects performance of the bank with a standard deviation (S = 0.837) and a mean (M=3.724), sixthly, due to mobile banking, monies are more secure in the bank (M =3.710) and standard deviation (S = 0.881).Under this variable, Performance was least affected by the fact that due to mobile banking, the value of deposits in the bank had increased, with a mean of (M = 3.462) and standard deviation (S = 0.697) which was high on the likert scale interpretation. All the other factors also had means that were high on the likert scale interpretation.

TABLE 8

Storage of monies for safe keeping

Storage of monies.	f	%	f	%	F	%	f	%	f	%	TF	T%	SD	mean
Likert scale	1		2		3		4	5						
Increased deposits	0	0	7	5	74	51	54	37	10	7	145	100	.69	3.462
Increased Loans	0	0	3	2	67	46	46	32	29	20	145	100	.81	3.697
Increased liquidity position	0	0	2	1	60	41	53	37	30	21	145	100	.79	3.766
Bank performance affected	1	1	3	2	61	42	50	34	30	21	145	100	.84	3.724
Monies more secure	3	2	2	1	59	41	51	35	30	21	145	100	.88	3.710
Record keeping better	1	1	1	1	45	31	72	49	26	18	145	100	.75	3.834
Account opening easier	0	0	0	0	42	29	65	45	38	26	145	100	.74	3.972
Set conditions observed	0	0	1	1	37	25	74	51	33	23	145	100	.72	3.959
Grand Mean														**3.766**

4.5.2 Transfer of Monies from one owner to another

This subsection analyzes the effect of transfer of monies from one owner to another variable on the performance of the Commercial banks in Kenya. In all the Commercial banks, as shown in Table 9 transfer of monies from one owner to another affected performance to a great extent with an average mean (M = 4.036) for all the nine items. Their performance was most strongly affected by competitiveness in the banks due to mobile banking technology (M = 4.276) and

standard deviation (S = 0.777), secondly, queues in the banking hall have reduced (M = 4.256) and standard deviation (S = 0.724).

Thirdly, Mobile banking technology offers convenience with a mean (M =4.241) and a standard deviation of (S = 0.68), fourthly, efficiency in service delivery with a mean (M = 4.179) and a standard deviation (S = 0.714), fifthly, mobile banking technology eliminates distance as a barrier to banking with a mean (M = 4.09) and a standard deviation (S = 0.686), sixthly, banks operational costs reduced with a mean (M=4.076) and a standard deviation (S = 0.765). Seventhly, mobile phone banking transaction costs lower than transport costs to and from the bank had a mean (M=4.034) and a standard deviation (S = 0.570).

The second last factor that least affected performance was the factor that due to mobile phone banking there is no dependence on branch network. This had a mean (M=3.626) and a standard deviation (S= 1.05).Their performance was least affected by factor number five in the questionnaire which stated that there was a reduction in staff costs (M = 3.545) and standard deviation (S=0.527).

TABLE 9

Transfer of monies from one owner to another

Transfer of monies	*F*	*%*	*f*	*%*	*f*	*%*	*F*	*%*	*f*	*%*	TF	T%	SD	Mean
Likert scale	1		2		3		4		5					
Reduced queues	0	0	1	1	21	15	63	43	60	41	145	100	.724	4.256
Competitiveness	0	0	1	1	26	18	50	34	68	47	145	100	.777	4.276
Efficiency	0	0	0	0	26	18	67	46	52	36	145	100	.714	4.179
Transaction costs lower	0	0	0	0	21	14	98	68	26	18	145	100	.570	4.034
staff costs reduced	0	0	1	1	65	44	78	54	1	1	145	100	.527	3.545
No branch network dependence	12	8	0	0	44	30	63	44	26	18	145	100	1.047	3.626
Banks operational costs reduced	1	1	1	1	28	19	71	50	44	30	145	100	.765	4.076
Elimination of distance	0	0	3	2	19	13	85	59	38	26	145	100	.686	4.09
Convenience	0	0	1	1	17	12	73	50	54	37	145	100	0.68	4.241
Grand Mean														4.036

4.5.3 Exchanging Forms of Monies

This subsection analyzes the exchange of forms of monies variable. Table 10 indicates that all the commercial banks were to great extent affected by exchange of forms of monies variable with an average mean (M = 3.831) for the six items in this section of the questionnaire. They indicated that their performance was most affected by the factor that deposits and withdrawals through the use of mobile phone banking has helped to reduce banks printing costs (M = 4.359); standard deviation (S=0.723) followed by the factor that deposits and withdrawals through the use of mobile phones has enabled minimum operating and maintenance costs (M = 4.048) and

standard deviation (S = 0.691), response of deposits and withdrawals through the use of mobile phones has helped to reduce general administrative expenses (M = 3.883) and standard deviation (S= 0.854).

Fourthly, deposits and withdrawals through this media has helped to reduce staff costs with a mean (M=3.676) and a standard deviation (S = 0.897),fifthly, exchange of forms of monies through mobile phones has helped to reduce premises and equipment costs (M=3.552) and a standard deviation (S=0.857).Under this variable, their performance was least affected by the factor that deposits and withdrawals through the use of mobile phones has helped to reduce depreciation and amortization expenses (M = 3.469) and standard deviation (S =0.928)

TABLE 3
Exchange of Forms of Monies

Exchange of money forms	F	%	F	%	f	%	f	%	f	%	TF	T%	SD	Mean
Likert scale	1		2		3		4		5					
Reduction in														
Printing costs	0	0	0	0	21	15	51	35	73	50	145	100	.723	4.359
Operating costs	0	0	0	0	31	22	76	52	38	26	145	100	.691	4.048
Staff costs	2	1	1	1	74	51	33	23	35	24	145	100	.897	3.676
Premises & equipment costs	1	1	11	7	61	42	51	35	21	15	145	100	.857	3.552
Administrative expenses	0	0	0	0	62	43	38	26	45	31	145	100	.854	3.883
Depreciation & Amortization expenses	0	0	24	17	49	34	52	35	20	14	145	100	.928	3.469
Grand Mean														**3.831**

4.5.4 Investments of Monies

This subsection analyzes the investment of monies variable. Table 11 indicates that all the commercial banks were to a great extent affected by investment of monies with an average mean (M = 4.047) for the seven items in this section of the questionnaire. They indicated that their performance was most affected by the factor that the bank generates income from transaction fees with (M = 4.531) and (S= 0.635); the benefits of mobile banking in my bank far outweigh the costs (M = 4.462) and (S= 0.613) and business relationship with telecommunication companies enhanced (M = 4.41) and (S=0.619).

The fourth most factor that affected performance under this variable was increased level of trust with stakeholders due to partnership with telecommunication companies with a mean (M=4.372) and (S=0.676), fifth in number was increased financial intermediation due to mobile banking deposits (M=4.317) and (S=0.752) The second least factor that affected performance was increased deposits as a result of this mobile banking component (M=4.159) and (S=0.955). Their performance was least affected by factor number three which stated that my bank offers soft loans to mobile banking clients thus generating loan processing fees (S=1.78) and (M = 2.076), a little extent, this could have been due to the fact that only three commercial banks in Kenya that is Kenya Commercial Bank, Commercial Bank of Africa and Equity Bank give soft loans on their mobile banking products while the rest do not.

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TABLE 4

Investments of Monies

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Investment of monies	f	%	f	%	f	%	F	%	f	%	TF	T%	SD	$\overline{X}$
Likert scale	**1**		**2**		**3**		**4**		**5**					
Increased deposits	1	1	9	6	23	16	45	31	67	46	145	100	.96	4.2
transaction fees	0	0	1	1	8	5	49	34	87	60	145	100	.64	4.5
Income fees from soft loans	106	73	0	0	0	0	0	0	39	27	145	100	1.8	2.1
Increased intermediation	1	1	3	2	10	7	66	45	65	45	145	100	.75	4.3
Enhanced relationships	0	0	1	1	7	5	68	47	68	45	145	100	.62	4.4
Increased trust Level	1	1	0	0	10	7	67	46	67	46	145	100	.68	4.4
Benefits outweigh costs	0	0	0	0	9	6	60	42	76	52	145	100	.61	4.5
Grand Mean														**4.1**

4.5.5 Performance

This subsection analyzes the performance variable. As shown in Table 12 the commercial banks indicated that their performance was affected to a great extent with an average mean of (M = 4.003) for the eleven items analyzed in the questionnaire for this section. Performance was best as indicated by; number of complaints about inefficiencies or excessive paper being few (M = 4.2) and (S =0.716);followed by mobile banking alerts have helped to minimize frauds, this in turn can be a saving in terms of compensation costs (M = 4.145) and (S = 0.666); the bank can withstand external pressure to generate short term results at lower costs (M = 4.124) and (S = 0.686); shorter time being taken to complete transactions (M=4.09) and (S=0.686); few errors reported by outside auditors (M=4.09) and (S =0.716); formal reviews before plans are approved based on costs being low (M =4.076) and (S = 0.625); number of registered users growing at a rate higher than rate at which costs are rising (M = 4.069) and (S = 0.625); high variation from

budget estimates (M=4.041) and (S=0.725); high output delivered on schedule (M = 4.013) and (S = 0.726); low deviations from cash plan (M=3.897) and (S=0.856). Performance was least indicated by; percent of loan advances outstanding is low with a standard deviation (S = 0.554) and (M = 3.3) though on the likert scale, this was to a moderate extent.

TABLE 5
Performance

Performance Likert scale	F 1	%	f 2	%	f 3	%	f 4	%	f 5	%	SD	$\overline{X}$
low% deviations from cash plan	2	1	5	4	34	23	69	48	35	24	0.9	3.9
Errors reported few	0	0	2	1	25	17	76	53	42	29	0.7	4.1
Few inefficiencies complaints	0	0	1	1	20	14	73	50	51	35	0.7	4.2
low loan advances	0	0	0	0	109	75	29	20	7	5	0.6	3.3
Output delivered on schedule high	0	0	1	1	34	23	72	50	38	26	0.7	4.0
High budget estimates variation	1	1	1	1	26	18	80	55	37	25	0.7	4.0
High growth rate of registered users	0	0	2	1	25	17	79	55	39	27	0.7	4.1
Shorter time to complete transactions	0	0	1	1	25	17	79	54	40	28	0.7	4.1
Bank withstanding pressure	0	0	0	0	20	14	87	60	38	26	0.7	4.1
Formal reviews low	0	0	0	0	23	16	88	61	34	23	0.6	4.1
Alerts helping to minimize frauds	0	0	0	0	23	16	78	54	44	30	0.7	4.1
Grand Mean												**4.0**

4.6 Further Data Analysis

In this section, data is analysed   further using econometrics methods of correlation between study variables, regression analysis , predictor variables and diagnostic tests for OLS assumptions.

4.6.1 Correlation between Study Variables

The linear relationship between all the study variables was sought. This was to establish how the variables correlated. Since the study had utilized ranked data, Spearman's Rank Correlation coefficients were used. Results are as presented in Table 13. The results reveal that there was

significant and moderate positive correlation between transfer of funds and performance of commercial banks ($r = 0.428$; $p < 0.05$). Further results indicate that there was weak positive correlation between performance of commercial banks and investments of funds ($r = 0.277$; $p < 0.05$) and also a weak positive correlation between exchange of funds and bank performance ($r = 0.185$; $p < 0.05$). However, the study results indicate that storage of monies did not have any significant effect on performance of banks ($r = 0.026$; $p > 0.05$) and there was no correlation between performance of commercial banks and storage of monies since the correlation coefficient is close to zero.

TABLE 13

Correlation Matrix

		PER	STO	TRA	EXC	INV
PER	Correlation Coefficient (r)	1.000				
	Sig. (2-tailed)	.				
	N	145				
STO	Correlation Coefficient (r)	.026	1.000			
	Sig. (2-tailed)	.755	.			
	N	145	145			
TRA	Correlation Coefficient (r)	$.428^{**}$	$.295^{**}$	1.000		
	Sig. (2-tailed)	.000	.000	.		
	N	145	145	145		
EXC	Correlation Coefficient (r)	$.185^{*}$	.060	.125	1.000	
	Sig. (2-tailed)	.025	.472	.134	.	
	N	145	145	145	145	
INV	Correlation Coefficient (r)	$.277^{**}$	$.763^{**}$	$.689^{**}$	$.323^{**}$	1.000
	Sig. (2-tailed)	.001	.000	.000	.000	.
	N	145	145	145	145	145
**. Correlation is significant at the 0.01 level (2-tailed).						
*. Correlation is significant at the 0.05 level (2-tailed).						

4.6.2 Regression Analysis

Regression analysis was performed at 95 % confidence level to test the statistical significance of the independent variables (Storage of monies for safe keeping, transfer of monies from one

owner to another, exchange of forms of monies and investments of monies) in explaining the dependent variable (Performance of banks in Kenya). The average ratings for the questions in each variable were used as the measures of the variables which enabled input into SPSS Version 21 that enabled the multiple regression analysis. The variables included were Storage of monies for safe keeping (STO), transfer of monies from one owner to another (TRA), exchange of forms of monies (EXC), investment of monies (INV) and Performance of banks in Kenya (PER).

In order to establish the goodness of fit of the regression model generated, a coefficient of determination R squared was generated. A model fits the data well if the differences between the observed values and the model's predicted value are small and unbiased. The R Squared measures the goodness of fit of a regression model and varies between 0 and 1.A value close to zero indicates that the model is not a good predictor over the mean model and one indicating perfect prediction. The results are shown in   table 14 below.

As presented in the table, R Squared is 0.458 meaning that mobile phone banking or the four independent variables (Storage of monies for safe keeping, transfer of monies from one owner to another, exchange of forms of monies and investment of monies) explains 45.8% of the variation in performance (cost efficiency).The other 54.2% of variations in performance is caused by chance or other factors not explored in this research and therefore further research should be conducted to determine other variables affecting cost performance of commercial banks. The correlation coefficient, R, also presented in table 14 shows that the R value was 0.517. A correlation of between 0.4 - 0.5 is moderately strong hence we conclude mobile phone banking and performance has a moderately strong relationship.

TABLE 14

Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.517	.458	.443	.38585
a. Predictors: (Constant), INV, EXC, TRA, STO				

Source: Research findings

Table 15 presents analysis of variance which indicates the variance from the regression and variance from errors. The table further indicates that F value was 29.532 and was significant at 95% confidence level. This indicates that the model was statistically significant and provided important predictive power.

TABLE 15

Analysis of Variance of the Regression

Source	Sum of Squares	Df	Mean Square	F	Sig.
Regression	17.601	4	4.400	29.532	.000
Residual	20.843	140	.149		
Total	38.444	144			
a. Dependent Variable: PER					
b. Predictors: (Constant), INV, EXC, TRA, STO					

Source: Research Findings

Table 16 presents the t tests. These indicate whether the independent variables had any significant effect on the dependent variable. Results in Table 16 show that storage of monies for safe keeping was not a significant predictor of performance of banks ($\beta = 0.248$; $p > 0.05$; $t = 1.53$). This indicates that any change to the money stored for safe keeping through mobile phone banking is not expected to have any significant effect on performance of banks. This is despite the fact that the coefficient of the storage variable is 0.248 indicating that a unit increase in money being stored for safe keeping would lead to 0.248 increase in performance of banks. This is because this is not significant at 95% confidence level as the significance value 0.128 is above 5%.

Transfer of monies from one owner to another through mobile phone banking was also not a significant predictor of performance of banks ($\beta = 0.219$; $p > 0.05$; $t = 1.221$). This is indicated by the significance value 1.221 which is greater than 0.05. However, change in transfer of monies by one unit would lead to a change in performance by 0.219, though the effect of the transfer is not significant.

Exchange of forms of money through mobile banking had a significant effect on performance of banks ($\beta = 0.246$; $p < 0.05$; $t = 2.987$). This therefore indicates that exchange of money that is facilitated through mobile phone banking significantly affects performance of banks. This indicates that an increase in exchange of money forms by one unit would result to a significant increase in performance of banks by 0.246. Moreover, based on the t-ratio of 2.987, exchange of money through mobile banking had the most significant effect on performance of banks among the independent variables included in the study.

Lastly, investment of monies transacted through mobile banking significantly affected performance of banks ($\beta = 0.231$; $p < 0.05$; $t = 2.517$). The results indicated that a change in

money invested by one unit would result to a significant change in performance of banks by 0.231. Moreover, through the t ratios, investing of money transacted through mobile banking was the second most significant influence of performance of banks (t = 2.517).

TABLE 16

Significance of Independent Variables

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	2.637	.361		7.316	.000
STO	.248	.162	.314	1.530	.128
TRA	.219	.179	.227	1.221	.224
EXC	.246	.082	.358	2.987	.003
INV	.231	.092	.334	2.517	.008
a. Dependent Variable: PE					

(Source: Research Findings)

4.6.3 Predictor Variable and Financial Performance

The regression model

$Y = 2.637 + 0.248 X_i + 0.219X_{ii} + 0.246X_{iii} + 0.231X_{iv}$……………………………………(ii)

is presented in table 16 above. The predictor variable is good for predicting performance because at least 50% of the variables have a level of significance that is less than 5%. The Y intercept, 2.637 represents   the units of performance when there is no mobile phone banking. The gradient or slope are 0.248; 2.219; 0.246 and 0.231 respectively. It means for a one unit increase in mobile banking technology, the expected change in performance is an increase of,

$$Y = 0.248 \ X_i + 0.219 X_{ii} + 0.246 X_{iii} + 0.231 X_{iv}\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\text{(iii)}$$

At least half of these coefficients are significant. Table 16 further shows the results of the linear regression t test. The linear regression t test is used to test the significance of the regression coefficients and has the null hypothesis that the regression coefficients are equal to zero. The null hypothesis is rejected if the p value is less than the significant value. The results show that the t statistic for the constant and gradient 7.316; 1.530; 1.221; 2.987 and 2.517 respectively are significant. At least half of the p values that is values for exchanges of monies and investments of monies are less than the significant level 0.05 hence we reject the null and conclude that coefficients are different from zero hence are significant.

4.6.4 Diagnostic test for OLS Assumptions

Some of the characteristics of a best regression model are firstly, high R Squared value, secondly, no serial correlation, thirdly, no heteroscedasticity and fourthly, residuals are normally distributed. These are also known as OLS assumptions.

Heteroscedasticity. Tests to determine violation of OLS assumptions were carried out. For homoscedasticity, the test was done using Breusch – Pagan/Cook-Weisberg test for heteroscedasticity. Heteroscedasticity is usually not desirable in an estimated regression model. If there is heteroscedasticity in a model, then it can be removed from the model. If p value is more than 5 % , it is not significant to influence the dependant variable. If R squared is high, it means the variables are nicely fitted. If F statistic is less than 5%, it is significant to explain the dependant variable. In the table of significance of independent variables, two of the independent variables EXC and INV were jointly significant to explain the model. If at least 50 % of the independent variables are significant, then the model is acceptable.

The first diagnostic test carried out was the test whether the variances of error terms were constant (homoscedasticity). This test was done using the Breusch-Pagan / Cook-Weisberg test for heteroscedasticity. The test has null hypothesis of constant variance of errors (homoscedasticity) with the alternate hypothesis being errors are not constant (heteroscedasticity). The results are presented in Table 17. The results indicate that there was no heteroscedasticity $(p > 0.05)$ in the residuals of the variables.

TABLE 17

Breusch-Pagan / Cook-Weisberg test for heteroscedasticity

Model	Dependent variable	χ^2- value	p-value
1	Performance of banks	3.53	0.0603

Normality of Residuals. A perfect regression model should have a residual which is normally distributed. Residual means actual dependant variable minus estimated dependant variable. Residual is the gap between actual and estimated. If the residual is normally distributed, the regression model is accepted. A small R squared means a model is not nicely fitted. From the ANOVA table, If F statistic is significant; it is less than 5%. Both the F statistic and R squared talk about joint significance therefore if F statistic is significant, one should not worry about R squared.

The second test that was performed was the test of normality of residuals. This is required for any linear regression as having residuals that are not normally distributed may produce forecasts that are inefficient or biased. Shapiro Wilk was used to test the normality of residuals as the sample size was small (N=145). Results are presented in Table 18. The findings indicate

that all the p values were above 5% indicating that residuals for all the variables were normally distributed.

TABLE 18

Shapiro Wilk Test of Normality

Variable	F-value	P value
STO	1.803	0.192
TRA	1.761	0.218
EXC	1.792	0.211
INV	1.671	0.282

Multicollinearity. If the value of R Squared is high but none of the independent variables are significant or very few independent variables are significant, we can suspect that probably, a model is suffering from multicollinearity. Significance level can also be called p value or Sig value. If p value is less than 5%, then that particular variable becomes significant. A high R squared means that the model is nicely fitted. If the value of VIF is more than 10 or tolerance is more than 0.2, we can say that the model is suffering from multicollinearity.

Tolerance level formula is calculated as 1 divided by VIF while the t statistic formula is calculated as coefficient divided by standard error. t statistic and p values have opposite values all the time. When P value goes up, the variable is not significant. After removing the problem of multicollinearity from a regression model, some of the variables can become significant. Ways of removing multicollinearity include increasing sample size, transformation of Variables and removing variables though removal of variables should be the last option because that variable may be very important to explain the dependant variable. When VIF is less than 10 or tolerance is less than 0.2, we say the model is free from multicollinearity.

The study assessed multicollinearity in the data using variance inflation factor (VIF). Multicollinearity is the high correlation between any two independent variables. The results are

presented in Table 19. For there to be multicollinearity, the VIF of any two variables needs to

be 10 or above. In the study, no variable had VIF of more than 10. Furthermore, the VIFs of

the independent variables were very small. This indicates that no two independent variables were

highly correlated.

TABLE 19

Testing Multicollinearity Using VIF

Variable	Tolerance	VIF
STO	.867	1.153
TRA	.932	1.073
EXC	.936	1.068
INV	.974	1.027

These results lead to a conclusion that mobile phone banking affects the performance of

Commercial banks in Kenya.

Concerning the effect of storage of monies for safe keeping on performance, the finding

was that Storage of monies for safe keeping does affect performance of Commercial banks in

Kenya though not significantly.

Concerning the effect of transfer of monies from one owner to another on performance

the result was that transfer of monies from one owner to another affects performance of

Commercial banks in Kenya, though not significantly.

Concerning the effect of exchange of forms of monies on performance the research

question was validated. Exchange of forms of monies that is mobile phone banking deposits and

mobile phone banking withdrawals affects performance of Commercial banks in Kenya significantly.

Concerning the effect of Investment of monies on performance the research question was validated. Investment of forms of monies positively affects performance of Commercial banks in Kenya

4.7 Interpretation of Findings

This research has found that performance was affected by exchange of forms of monies especially the factor that deposits and withdrawals through the use of mobile phones has helped to reduce printing costs and has also enabled minimum operating and maintenance cost. Investments of monies also affected performance. Generation of Income from transaction fees and the benefits of mobile banking far outweighing the costs had the strongest effect. Storage of monies for safe keeping and transfer of monies from one owner to another also affected performance though not significantly.

The findings indicate that through storage of monies for safe keeping, transfer of monies from one owner to another, exchanging of forms of monies and investment of monies, mobile phone banking improved the performance of commercial banks in Kenya. The findings support those of a related study, Mattilla (2002).The study focused on factors affecting the adoption of mobile banking services. In this study, regular and occasional users named availability of services regardless of time and space and accessibility as reasons to adopt. Other factors named as reasons to adopt were savings in time and effort, similar to shorter time being taken to complete transactions in this study. This factor had a mean (M=4.09) showing that performance was affected to a great extent. Another finding in the study of Mattilla (2002) was that there are savings in the financial costs of conducting banking. This is similar to the factor that stated that

mobile banking transaction costs is lower than transport costs to and from the bank that had a

mean of (M = 4.034) showing that performance of the bank was affected to a great extent.

CHAPTER FIVE

DISCUSSIONS OF RESEARCH FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary Discussion of Research Findings

Theoretical postulation indicated that cost performance of Commercial banks in Kenya improves due to mobile phone banking. The channels through which the improvement is realized include storage of monies for safe keeping, transfer of monies from one owner to another, exchange of forms of monies and investments of monies. This means there should be positive relationships between performance and storage of monies for safekeeping, transfer of monies, exchange of forms of monies and investment of monies. The data was analyzed using descriptive statistics of means, standard deviation and frequency of responses. Correlation analysis, analysis for violation of OLS assumptions and multiple regression analysis was also done.

To determine the linear relationship between all the study variables, Spearman's Rank Correlation Coefficient was used. Tests to determine violation of OLS assumptions were carried out. For homoscedasticity, the test was done using the Breusch-Pagan / Cook-Weisberg test for heteroscedasticity. Shapiro/Wilk was used to test the normality of residuals while multicollinearity was assessed using Variance Inflation factor or VIF.

Results presented in the regression model summary indicated that the R squared for the regression was 0.458 indicating that the four independent variables (Storage of monies for safe keeping, transfer of monies from one owner to another, exchange of forms of money and investment of monies) explained 45.8% of the change in performance of the banks. This indicates that there are other factors that were not included in the model that explained 54.2% of the performance of the banks.

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The ANOVA table presented analysis of variance which indicated the variance from the regression and variance from errors. The table further indicated that F value was 29.532 and was significant at 95% confidence level. This indicates that the model was statistically significant and provided important predictive power.

5.1.1 Storage of Monies for safe keeping objective

Results indicate that majority agreed to a great extent with the statements on storage of monies for safe keeping. This was revealed by a mean score of 3.766.

The t tests indicated whether the independent variables had any significant effect on the dependent variable. Results showed that storage of monies for safe keeping was not a significant predictor of performance of banks ($\beta = 0.248$; $p > 0.05$; $t = 1.53$). This indicates that any change to the money stored for safe keeping through mobile banking is not expected to have any significant effect on performance of banks. This is despite the fact that the coefficient of the storage variable is 0.248 indicating that a unit increase in money being stored for safe keeping would lead to 0.248 increase in performance of banks. This is because this is not significant at 95% confidence level as the significance value (0.1238) was above 5%.

However, the study results indicate that storage of monies did not have any significant effect on performance of banks ($r = 0.026$; $p > 0.05$).

5.1.2 Transfer of monies from one owner to another objective

In all the commercial banks, transfer of monies from one owner to another variable affected performance to a great extent with an average mean ($M = 4.036$) for all the nine items. Transfer of monies from one owner to another through mobile banking was not a significant predictor of performance of banks ($\beta = 0.219$; $p > 0.05$; $t = 1.221$). This is indicated by the significance value (1.221) which is greater than 0.05. However, change in transfer of monies by one unit would lead

to a change in performance by 0.219, though the effect of the transfer is not significant. The results reveal that there was significant and moderate positive correlation between transfer of funds and performance of commercial banks ($r = 0.428$; $p < 0.05$).

5.1.3 Exchange of forms of monies objective

Exchange of forms of money through mobile banking had a significant effect on performance of banks ($\beta = 0.246$; $p < 0.05$; $t = 2.987$). This indicates that an increase in exchange of money forms by one unit would result to a significant increase in performance of banks by 0.246. Moreover, based on the t-ratio of 2.987, exchange of money through mobile banking had the most significant effect on performance of banks among the independent variables included in the study.

Results indicate that the majority agreed to a great extent with the statements on exchange of forms of monies. This was depicted by a mean score of 3.831 for the six items under this variable. Results indicate that there was a weak positive correlation between exchange of funds and bank performance ($r = 0.185$; $p < 0.05$).

5.1.4 Investments of monies objective

Investments of monies statements were agreed on to a very great extent with a mean score of 4.047. Investment of monies transacted through mobile banking significantly affected performance of banks ($\beta = 0.231$; $p < 0.05$; $t = 2.517$). The results indicated that a change in money invested by one unit would result to a significant change in performance of banks by 0.231. Moreover, through the t ratios, investing of money transacted through mobile banking was the second most significant influence of performance of banks ($t = 2.517$). Further results indicate that there was weak positive correlation between performance of commercial banks and investments of funds ($r = 0.277$; $p < 0.05$)

This research was designed to find out the unique relationship between performance and storage of monies for safe keeping, transfer of monies from one owner to another, exchange of forms of monies and investment of monies among Commercial banks in Kenya. Primary data was collected from the commercial banks using a self-administered structured questionnaire. Regression analysis was done to establish the relationship among the variables believed to be key in mobile phone banking among banks in Kenya.

5.2 Conclusions

From the findings of this research, the following conclusions are made. Performance was most strongly affected by the factor that number of complaints about inefficiencies or excessive paper being few, alerts helping to minimize frauds, bank withstanding external pressure to generate short term results at lower costs, shorter time being taken to complete transactions, few errors reported by outside auditors, formal reviews before plans are approved based on costs being low, number of registered users growing at a rate higher than rate at which costs are rising, high variation from budget estimates, high output delivered on schedule, low deviations from cash plan and percentage of loan advances outstanding being low in that order.

Further, storage of monies for safekeeping affected performance through the following factors, arranged in a descending order. Account opening being easier with mobile banking, internal financial policies strictly observing conditions set by the CBK, record keeping being better, increased liquidity position, non introduction of mobile banking products/services affecting bank performance, monies being more secure in the bank, increase in value of loans and advances and lastly, increase in the values of deposits in the bank.

Performance was to a great extent affected by transfer of monies from one owner to another through the following factors, in descending order. Competitiveness in the banks due to

mobile banking technology, reduced queues in the banking hall, convenience in mobile phone banking technology, efficiency in service delivery, elimination of distance as a barrier to banking, reduction of banks operational costs, mobile phone banking transaction costs being lower than transport costs to and from the bank, no dependence on branch network and reduction in staff costs.

Likewise Exchange of forms of monies affected performance through reduced printing costs, minimum operating and maintenance costs, reduction in general administrative expenses, reduction in staff costs, reduction in premises and equipment costs and reduced depreciation and amortization expenses

Lastly, investment of monies affected performance through generation of income from transaction fees, benefits of mobile banking outweighing the costs, enhanced relationship with telecommunication companies, increased level of trust with stakeholders, increased financial intermediation   and increased value of deposits and income due to loan processing fees. This factor had the least mean (M = 2.076) on one of its factors due to the fact that only three commercial banks in Kenya which are CBA, KCB and Equity offer soft loans on their mobile phone banking product.

5.3 Recommendations

Based on the findings of this study, the following recommendations arise.

5.3.1 Policy Recommendations

Apart from KCB and Equity, the other commercial banks in Kenya should come up with products and services similar to CBA'S Mshwari. Secondly, CBK should set out clear policies concerning how mobile phone funds are kept and handled and who controls the accounts. Thirdly, CCK should come up with fair rules to enable fair competition among

telecommunication service providers. Fourthly,   local commercial banks in Kenya should diversify their investments before technology pushes them out of business.

Results indicate that telecommunication companies have taken up a huge market share of the business of banks. Diversification of Investments and joining telecommunication companies in the game will enable survival of the Commercial banks in the face of stiff competition.

5.4 Suggestions for Further Research

Also given that Kenya has taken the lead in mobile money in the world, the study can be expanded to cover other banks in other continents in order to provide results that will be useful in that context. A study can be done to cover banks in Asia, other countries in Africa, North America, South America, Europe and Australia.

A future researcher can conduct a research with the aim of determining the effects of mobile payments on other business organizations.

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APPENDICES

APPENDIX I

LIST OF COMMERCIAL BANKS IN KENYA

1. African Banking Corporation Ltd.

2. Bank of Africa Kenya Ltd.

3. Bank of Baroda (K) Ltd.

4. Bank of India

5. Barclays Bank of Kenya Ltd.

6. CFC Stanbic Bank Ltd.

7. Chase Bank (K) Ltd.

8. Commercial Bank of Africa Ltd.

9. Consolidated Bank of Kenya Ltd.

10. Co-operative Bank of Kenya Ltd.

11. Credit Bank Ltd

12. Citibank N.A.

13. Development Bank of Kenya Ltd.

14. Diamond Trust Bank Kenya Ltd.

15. Dubai Bank Kenya Ltd.

16. Ecobank Kenya Ltd

17. Equatorial Commercial Bank Ltd.

18. Equity Bank Ltd

19. Family Bank Limited

20. Fidelity Commercial Bank Ltd

21. Fina Bank Ltd

22. First community Bank Limited

23. Giro Commercial Bank Ltd.

24. Guardian Bank Ltd

25. Gulf African Bank Limited

26. Habib Bank A.G Zurich

27. Habib Bank Ltd.

28. Imperial Bank Ltd

29. I &M Bank Ltd

30. Jamii Bora Bank Limited.

31. Kenya Commercial Bank Ltd

32. K-Rep Bank Ltd

33. Middle East Bank (K) Ltd

34. National Bank of Kenya Ltd

35. NIC Bank Ltd

36. Oriental Commercial Bank Ltd

37. Paramount Universal Bank Ltd

38. Prime Bank Ltd

39. Standard Chartered Bank Kenya Ltd

40. Trans-National Bank Ltd

41. UBA Kenya Bank Limited

42. Victoria Commercial Bank Ltd

43. Housing Finance Ltd

Source: (Central Bank of Kenya)

APPENDIX II

INTRODUCTION LETTER

KCA UNIVERSITY

MSC PROGRAMME

TELEPHONE   P.O. BOX ………….

TELEGRAMS: NAIROBI, KENYA

TELEX:

June 10, 2015

The Manager,

Dear Sir/Madam,

RE: COLLECTION OF DATA

I am a student of KCA University, pursuing a Master of Science (Commerce) degree. In partial fulfillment of the requirements for this degree, I am required to carry out a research thesis on a real topic in my area of study. I am conducting a survey to find out the **"Effect of mobile phone banking on the performance of Commercial banks in Kenya''**

I kindly request you to provide the required information to the best of your knowledge by filling out the attached interview guide. The information is strictly for academic purposes only and will be treated in the strictest confidence. A copy of the research project will be made available to you on request. Your kind assistance will be highly appreciated.

Yours faithfully,

Donna M.A. Abong'o

QUESTIONNAIRE

Section A.

This questionnaire is intended to evaluate the effects of mobile phone banking on the performance of banks in Kenya. The information provided is for academic purposes only.

Please answer all questions honestly according to the given instructions

1. Name of the respondent (optional)?...

2. Highest level of education attained?

CERTIFICATE ( )   DIPLOMA( )

MASTERS ()   DEGREE ( )

3. Name of the bank? ....

BBK ( )   NIC ( )

CBA ( )   KCB( )

DTB ( )   NBK( )

EQTY ( )   SCBK( )

HFCK ( )   COOP( )

4. Position in the Company

Director ( )

Manager ( )

Other Staff ( )

5. Does your bank offer mobile banking products/services?

Yes ( )

No ( )

Section B

To what extent do you agree that the following affect the performance of your bank as a result of introduction of mobile phone banking products/services?

Tick the option that best explains your view.

(1= Not at all, 2= little extent, 3=Moderate extent, 4=Great extent, 5=Very great extent)

I) Storage of money for safe keeping	1	2	3	4	5
1. Due to mobile banking, the value of deposits in my bank has increased.					
2. The value of loans and advances in my bank has increased					
3. There is increased liquidity position					
4. Non introduction of mobile banking products/services affects performance of the bank					
5. Due to mobile banking, monies are more secure in the bank					
6. Record keeping is better					
7. Account opening is easier with mobile banking					
8. Internal financial policies strictly observe conditions set by the CBK					

Section C

To what extent do you agree that the following affect the performance of your bank as a result of mobile phone banking products/services?

Tick the option that best explains your view.

(1= not at all, 2= little extent, 3=moderate extent, 4=great extent, 5=very great extent)

ii.)Transfer of monies from one owner to another	1	2	3	4	5
1. Queues in the banking hall have reduced					
2. Competitiveness in the banks due to mobile technology					
3. Efficiency in service delivery					
4. Mobile banking Transaction costs is lower than transport costs to and from the bank					
5. Reduction in staff costs					
6. No Dependence on branch network					
7. Banks operational costs reduced					
8. Mobile banking technology eliminates distance as a barrier to banking					
9. Mobile banking technology offers convenience					

Section D

To what extent do you agree that the following affect the performance of your bank as a result of introduction of mobile banking product/services? Tick the option that best explains your view.

(1= not at all, 2= little extent, 3=moderate extent, 4=great extent, 5=very great extent)

iii) Exchanging of forms of monies i.e. mobile phone banking deposits and withdrawals	1	2	3	4	5
1. Deposits and withdrawals through the use of mobile phones has helped to reduce banks printing costs					
2. Deposits and withdrawals through the use of mobile phones have enabled minimum operating and maintenance costs.					
3. Deposits and withdrawals through the use of mobile phone has helped to reduce staff costs					
4. Deposits and withdrawals through the use of mobile phones has helped to reduce premises and equipment costs					
5. Deposits and withdrawals through the use of mobile phones has helped to reduce general administrative expenses					
6. Deposits and withdrawals through the use of mobile phones have helped to reduce Depreciation and amortization expenses.					

Section E

To what extent do you agree that the following affect the performance of your bank as a result of introduction of mobile phone banking products/services? Tick the option that best explains your view.

(1= Not at all, 2= little extent, 3=Moderate extent, 4=Great extent, 5=Very great extent)

iv) Investment of monies	1	2	3	4	5
1. Due to mobile banking, the value of deposits in my bank has increased.					
2. My bank generates income from transaction fees.					
3. My bank offers soft loans to mobile banking clients thus generating loan processing fees-income					
4. Increased financial intermediation due to mobile banking deposits.					
5. Business relationship with telecommunication companies enhanced.					
6. The level of trust has increased with our stakeholders due to partnerships with telecommunication companies					
7. The benefits of mobile banking in my bank far outweigh the costs.					

Section F

Indicate by a tick (✓) the extent to which you agree with the following statements concerning the performance of your bank as a result of its mobile phone banking services and product.

(1= Not at all, 2= little extent, 3=Moderate extent, 4=Great extent, 5=Very great extent)

v) Performance	1	2	3	4	5
1. Percent of deviations from cash plan is low					
2. Errors reported by outside auditors are few					
3. Number of complaints about inefficiencies or excessive paper are few					
4. Percent of loan advances outstanding is low					
5. Percent of output delivered on schedule is high					
6. Percent variation from budget estimates is high					
7. The number of registered users is growing at a rate higher than rate at which costs are rising					
8. Shorter time is taken to complete transactions					
9. Your bank can withstand external pressures to generate short-term results at lower costs					
10. The number of formal reviews before plans are approved based on costs is low					
11. Mobile banking alerts have helped to minimize frauds. This in turn can be a saving to the bank in terms of compensation costs.					

Any other views e.g. additional comments and difficult wording.

a) _____

b) _____

c) _____