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Effect of mobile banking investment on financial profitability - A Case of Tier one banks in Kenya

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Effect of Mobile Banking Investment on Financial Profitability: A Case of Tier One Banks in Kenya

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DECLARATION

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other university. To the best of my knowledge and belief, the dissertation contains no material previously published or written by another person except where due reference is made in the thesis itself.

Catherine Waiganjo

June 2018

Approval

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DEDICATION

I dedicate this research project report to my life partner Kimani Kinuthia who always pushes me to greater heights and pushes me beyond limits I thought I could not go beyond. To my daughter Genesis Kimani may this show you that you can achieve what you decide to achieve despite your circumstances. To my parents, Mr. and Mrs. Waiganjo Gichuki, who have always been with me in my life journey guiding and supporting, I love you.

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ABSTRACT

The movement from traditional branch banking to mobile banking has caused banks to come up with strategies to attract more customers and retain existing ones. The desire to reduce both operational, administrative cost and competition has driven banks to adopt mobile banking. Technological advancements in the area of telecommunications and information technology have continued to revolutionize the banking industry. The Kenyan banking sector has witnessed many changes since the beginning of digital transformation. While the rapid development of information technology has made some banking tasks more efficient and cheaper, technological investments are taking a larger share of bank's resources. There is a paucity of published work on the effect of mobile banking investment on financial profitability of Tier I commercial banks, particularly in the context of developing countries in the dynamic African region and specifically in Kenya. This study intended to bridge this gap in the knowledge that exists. The main objective of this study was to evaluate the effect of mobile banking investment on financial profitability in Tier 1 Commercial Banks in Kenya. The study employed a descriptive research design. The unit of study for the research was tier one banks in Kenya. The survey was administered to 190 participants as a representative sample of the entire population. The data for this study was collected using a self-administered questionnaire. Another type of data that was used is secondary data which will be derived from the previous studies and Tier I commercial banks' financial statements. The quantitative data collected from respondents was analyzed using Statistical Package for Social Sciences (SPSS) to produce descriptive analysis and inferential statistics. Qualitative data obtained from the open-ended questions in the questionnaire was analyzed thematically. The study concluded that: Monthly value moved through mobile banking, and that the number of users of mobile banking do influence financial profitability of the banks to a very great extent. Therefore, this study concluded that there exists a positive association between perceived increased customer base, mitigating fraud and cybercrime, investing in security systems, and risk management practices that suggest that when one increases, financial profitability of the banks increase. The study recommends need for policy makers to consider mobile banking in their formulation of policies because of the technological developments and the expected switch from physical branch networks to technologically supported banking channels. There is also a need to conduct a study on the challenges faced in the adoption of mobile banking in commercial banks in Kenya.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS AND ACRONYMS

3G	-	Third Generation
ANOVA	-	Analysis of Variance
ATM	-	Automated Teller Machines
CBA	-	Commercial Bank of Africa
CBK	-	Central Bank of Kenya
CGAP	-	Consultative Group to Assist the Poor
CRB	-	Credit Reference Bureaus
DTB	-	Diamond Trust Bank
EFT	-	Electronic Funds Transfer
ICT	-	Information and Communication Technology
IT	-	Information Technology
M-banking	-	Mobile banking
NHIF	-	National Health Insurance Fund
OTP	-	One time passwords
PDA	-	Personal Digital Assistants
SMEs	-	Small and Medium Enterprises
SPSS	-	Statistical Package for Social Science

DEFINITION OF TERMS

Mobile banking	Any transaction, involving the transfer of ownership or rights to use goods and services, which is initiated and/or completed by using mobile access to computer- mediated networks with the help of an electronic device
Profitability	Ability of a company to use its resources to generate revenues more than its expenses
Risk	Possibility of loss or injury
Risk Management	The process of identifying, assessing and controlling threats to an organization's capital and earnings
Security	Freedom from, or resilience against, potential harm from external force
Technology	The purposeful application of information in the design, production, and utilization of goods and services, and in the organization of human activities
Tier I Bank	A bank with a weighted composite index of 5 per cent and above and classified as a large bank

CHAPTER ONE

INTRODUCTION

1.0 Introduction to the Study

Chapter 1 looks at the background to the study, statement of the problem, objectives of the study, research questions, significance of the study, scope of the study and limitations of the study. Chapter 2 delves into the literature available on mobile banking and discusses the impact on the study with an aim to establish the gap which defines the study. Chapter 3 introduces the design that was used for the research, and then discussed the population of study, sampling method and the sample size that were used. Chapter 4 discusses the key issues related to data presentation, analysis and interpretation have been discussed and presents responses from all staff in mobile banking, finance and sales staff in the banks regarding 'Effect of mobile banking investment on Profitability'. Lastly, Chapter 5 provides summary of the findings, discussions, conclusions and recommendations of the study based on the research findings presented in Chapter 4.

1.1 Background to the Study

Profitability is the efficiency of a company at generating more earnings than expenses incurred over the same period under consideration. The introduction of mobile banking has revolutionized and redefined how banks are operating. It has increased the competition amongst banks as they are offering more modern ways of banking and efficient services which determine the effect on the banks profitability and it has led to decreased costs especially on labor costs which positively influence profits generated. Profit is the goal of commercial banks and all the strategies designed and activities performed thereof are meant to realize this objective. Profitability is the ability to make profit from all the business activities of an organization, company, firm, or an enterprise. It measures management efficiency in the use of organizational resources in adding value to the business (Soyemi, Ogunleye & Ashogbon, 2014). Profitability is the relationship of income to some balance sheet measure which indicates the relative ability to earn income on assets. Irrespective of the fact that profitability is an important aspect of business, it may be faced with some weakness such window dressing of the financial transactions and the 4 use of different accounting principles (Aduda & Gitonga, 2011).

Mobile banking (m-banking) is a term used for performing banking transactions via mobile device such as mobile phones (Anyasi & Otubu, 2009). Tiwari, Buse and Herstatt (2006) define mobile banking as any transaction, involving the transfer of ownership or rights to use goods and services, which is initiated and/or completed by using mobile access to computer- mediated networks with the help of an electronic device. They further indicate that mobile banking refers to provision and availability of bank-related financial services with the help of mobile telecommunication devices. The scope of offered services may include facilities to conduct bank and stock market transactions, to administer accounts and to access customized information from the bank. Mobile banking is most often performed via short message services (SMS) or mobile internet but can also be used by special programs called clients downloaded to the mobile device (Al-Jabir, 2012). According to Saleem and Rashid, (2011), M-banking refers to the use of mobile telecommunication devices to offer banking services. For example, customers can use mobile phones or personal digital assistants (PDAs) to withdraw money from their bank.

The financial services industry has recently been open to historic transformation. The movement from traditional branch banking to mobile banking has caused banks to come up with strategies to attract more customers and retain existing ones. The desire to reduce both operational, administrative cost and competition has driven banks to adopt mobile banking. However, cost reduction is only realizable with an increase in customer adoption (Saleem & Rashid, 2011). Technological advancements in telecommunications and information technology have continued to revolutionize the banking industry. The delivery of financial services has experienced major changes during the past few years. A feature of the banking industry across the globe has been that it is increasingly becoming turbulent and competitive thereby forcing commercial banks to innovate for survival. Banks, aided by technological developments, have responded to the challenges by adopting new strategies which emphasize on attempting to build customer satisfaction through offering better products and services and at the same time to minimize operation costs (Asongu, 2012).

In order to be in line with the changes in the operating environment, it is apparent that banks in Kenya and other financial institutions have to embrace mobile banking in meeting customer demands. Providing banking through internet has proven fruitful in terms of cost control by

employing automated ways of transacting other than the traditional method of labour intensive therefore higher productivity and profitability. Consequently, growing partnership in financial institution and other service providers has led to an increase in m banking as customers can transact and clear utility bills through their mobile (Mutua, 2015).

Banking was in the recent past meant for a few people in Kenya especially due to high bank fees, untailored bank products and services and limited geographical reach (Chogi, 2006). The developments in the banking sector have seen increased number of users of banking services. Several banks have innovated various M-banking products for example, Equity bank-Eazzy Banking, KCB-Mobibank, Cooperative bank-M-Coop Cash, Barclays Bank-Hello Money, Commercial bank of Africa-M-shwari, Diamond Trust Bank-DTB Touch and Stanbic Bank - NOW.

Mobile banking investments in commercial banks have helped banks in a number of ways. For example, the adoption and investment in new technologies improves efficiency, leads to growth in customer base, reduce transactions costs and time, improve service delivery and general improvement in performance and hence growing businesses and increased profitability which has encouraged a cashless society. The service delivery evolution has been witnessed by customers moving away from the traditional interpersonal service encounter to technology-based self-service which provides benefits to both the bank, as it reduces the transaction costs leading to increase in profits and to the customer as there is increased convenience, (Asongu, 2012).

Commercial banks play a key role in the economic resource allocation of any country as they channel funds from depositors to investors on a day to day basis. This role is possible when the bank can generate necessary income to cover operational cost they incur in the whole process. Furthermore, for a sustainable intermediation role of commercial banks, they need to be profitable since profits rewards investors for their investments in turn encourages additional investment and brings about economic growth of a country. On the other hand, poor banking performance can lead to banking failure and crisis which have negative effect on the economic growth of a country (Marshall, 2009).

Nyanchama (2015), indicated that profits of banks are majorly from the fees they charge for services provided and from interest earned on the banks assets such as loans and securities they

hold. To drive customer loyalty and bank profitability, banks will have to understand customer willingness to pay by looking keenly on proper pricing of their products and services at the same time provide secure, accessible and differentiated products and services to serve different customer needs. The common measures of banks profitability include return on assets (ROA), return on equity (ROE), Net Interest Margin (NIM), Market power, efficiency and capitalization. The ability of banks to deliver products and services in the most effective and efficient manner, will therefore be the key to performance.

Use of financial innovation can contribute to improved bank performance by increasing banks market share, expand products range and customized products, improving service delivery, reducing banks overheads and transaction related costs and increasing the geographical reach all of which contribute to profitability (Lee, Lee & Kim, 2009). Nyanchama (2015) suggested that e-banking is driven largely by the prospects of operating costs minimization and operating revenues maximization. A comparison of online banking in developed and emerging markets revealed that in developed markets lower costs and higher revenues are more noticeable.

The application of information and communication technology concepts, techniques, policies and implementation strategies to banking services has become a key concern to all banks and indeed a requirement for local and global competitiveness banking (Nyanchama, 2015). The degree of competition in the banking industry matters for the efficiency of production of financial services, the quality of financial products and the degree of innovation in the sector (Claessens, 2009). Banks need to have sufficient capital and be diversified enough to absorb major shocks whilst remaining sufficiently competitive to provide consumers with reasonably priced services. They also must ensure that they improve their network coverage, have quality connections and reduced costs as a way of gaining a competitive advantage in the market (Kigen, 2010). Although the rapid development of information technology has made some banking services more efficient and cheaper, technological investments are taking a larger share of banks resources. Regardless of the many concerns on banking innovations, a positive relationship exists between mobile banking and bank performance. This study intends to examine the effects of mobile banking investments in financial profitability in Commercial Banks in Kenya with a case study of the Tier 1 commercial banks.

1.1.1 Banking Industry in Kenya

The Kenyan banking sector registered a robust performance in the past few years (Ochieng, 2016). The total net assets in the banking sector stood at Kshs. 3.7 trillion as at 31st December 2016. There were 23 local private commercial banks and 3 local public commercial banks which accounted for 65.1 percent and 3.9 percent of total net assets respectively. A total of 13 commercial banks were foreign owned and accounted for 31.0 percent of the sector's assets (CBK, 2017). All banks are regulated by the Central Bank of Kenya. The Capital Markets Authority has additional oversight over the listed banks. All banks are required to adhere to certain prudential regulations such as minimum liquidity ratios and cash reserve ratios with the Central Bank (Ochieng, 2016).

As at 31st December 2017, the banking sector comprised of the Central Bank of Kenya, as the regulatory authority, 43 banking institutions (42 commercial banks and 1 mortgage finance company), 8 representative offices of foreign banks, 12 Microfinance Banks (MFBs), 3 credit reference bureaus (CRBs), 15 Money Remittance Providers (MRPs) and 80 foreign exchange (Forex) bureaus. Out of the 43 banking institutions, 40 were privately owned while the Kenya Government had majority ownership in 3 institutions. Of the 40 privately owned banks, 26 were locally owned (the controlling shareholders are domiciled in Kenya) while 14 were foreign-owned (many having minority shareholding). The 26 locally owned institutions comprised 25 commercial banks and 1 mortgage financier. Of the 14 foreign-owned institutions, all commercial banks, 10 were local subsidiaries of foreign banks while 4 were branches of foreign banks. All licensed microfinance banks, credit reference bureaus, Forex bureaus and money remittance providers were privately owned (Cytonn Investments Bank Report, 2017).

Kenyan commercial banks are classified into three peer groups (also known as Tiers) using a weighted composite index that comprises net assets, customer deposits, capital and reserves, number of deposit accounts and number of loan accounts. A bank with a weighted composite index of 5 per cent and above is classified as a large bank (Tier I Bank). A medium bank (Tier II Bank) has a weighted composite index of between 1 per cent and 5 per cent while a small bank (Tier III Bank) has a weighted composite index of less than 1 per cent. For the period ended 31st December 2015, there were 7 large banks with a market share of 58.21 per cent, 12 medium

banks with a market share of 32.42 per cent and 21 small banks with a market share of 9.24 per cent (CBK,2017).

The Top Tier I Banks in Kenya include Kenya Commercial Bank, Equity Bank, Co-operative Bank, Standard Chartered Bank, Barclays Bank, Commercial Bank of Africa (CBA), Stanbic Bank and Diamond Trust Bank (DTB), (CBK, 2018). Tier 1 banks have been purposively chosen for this study because of their asset base and because they are the largest banks in Kenya.

1.2 Statement of the Problem

Some theories support the effect of level of investment in mobile banking on profitability of commercial banks in Kenya. The theory of financial intermediation is supported by the adoption of agency banking by banks that has seen more customers' access to fast, efficient and convenient banking services by extending geographical reach of banks (Nyanchama, 2015). Attracting more customers means banks will increase their profits. The diffusion of innovation theory talks about the mobile banking innovation by banks and explains how it effects on profitability and competitiveness of commercial banks. Through innovation banks have integrated with mobile phones service providers who have many customers and they can take advantage to attract these customers to the mobile banking platform in turn increase their profits and at the same time it will have a negative effect on costs.

The banking sector in Kenya has experienced turbulent times following the collapse of many banks in the 1990s only financial institutions that are able to adapt to the changing environment and to new ideas and business methods will survive. In 2012, CBK allowed regulated deposit taking microfinance institutions to operate not only through 8 third party agents but to operate licensed agencies as a way of facilitating further financial deepening. To minimize their operational costs, commercial banks have adopted internet banking, agency banking and mobile banking where customer can access their accounts on their personal computers, mobile phones and through numerous mobile agents opened countrywide. Level of investments in mobile banking have led to increased customer base in banks, reduced fraud and cybercrime, as well as ensuring the commercial banks have set up very high technical and advanced security systems to help reduce risks that arise with mobile banking and technology. All these models are geared

towards leveraging the operating costs of commercial banks. But how well do these models influence the profitability of banks?

The effects of technology in banking can be both positive and negative from a financial perspective. On one hand, banks may reap profits because of investment in efficient technologies (Magutu, Mwangi & Ongeri, 2009). While on the other hand, there may be losses in the short run due to high costs of implementation, system failures, maintenance and training (Siam, 2006). As the commercial banks in Kenya adopt mobile money technology in their ways of doing business, such key issues as cost of m-banking services, system security, speed of service and skills requirement need to be investigated with a view of establishing their overall effect on the performance of commercial banks. Commercial banks must improve and invest in very good technology to ensure that they also reap good profits from the mobile banking.

A number of studies carried out on mobile banking and financial profitability such by Mabwai, (2016); Nyanchama, (2015); Kathuo, (2015); Mutua, (2015); Kithaka, (2014); Amugongo, (2013); Harelimana, (2017); Maina, (2012); Jalang'o, (2015); Mwange, (2013) and Mutua, (2012) have failed to give detailed insights on the effect of mobile banking investment on financial profitability of Tier I Commercial banks in Kenya. Although the studies among others attained their objectives, they did not delve into the effect of mobile banking investment on financial profitability of Tier I Commercial banks in Kenya. There is a paucity of published work on the effect of mobile banking investment on financial profitability of commercial banks, particularly in the context of developing countries in the dynamic African region and specifically in Kenya. This study intended to bridge this gap in knowledge that exists by giving contributions towards financial profitability of banks using mobile banking investments.

1.3 Research Objectives

1.3.1 General Objective

The main objective of this study was to evaluate the effect of mobile banking investment on financial profitability in Commercial Banks in Kenya.

1.3.2 Specific Objectives

The specific objectives are to:

i. Determine the effect of perceived increased customer base on financial profitability

ii. Evaluate the effect of mitigating fraud and cybercrime on financial profitability

iii. Find out the influence of risk management practices on financial profitability

iv. Establish the effect of advanced security systems on financial profitability

1.4 Research Questions

i. What is the effect of perceived increased customer base on financial profitability

ii. What is the effect of mitigating fraud and cybercrime on financial performance

iii. What is the influence of risk management practices on financial performance

iv. What is the influence of advanced security systems on financial performance

1.5 Significance of the Study

The findings of this research will be very useful to financial managers, analysts and strategy leaders in large peer group banks in Kenya, as it will help guide them on the exact contribution of mobile banking investment on profitability as well as guide them on the necessary levels of mobile banking investments that they need to implement. Additionally, other banks not necessarily in the large peer group will also find the study useful as they will learn from the experiences of large peer group banks.

Kenya Bankers Association which brings together all banks in the country will find the results of this study very useful for their day to day operations and in making relevant policy changes to help its member banks realize financial profitability.

The Central Bank of Kenya will find this study useful in determining regulatory frameworks that it needs to enforce especially those that touch on mobile banking in banks. Mobile banking consultants and service providers will find the results of this study very useful for them as it will aid them to know the specific mobile banking components that they need to sell to banks to help them maintain profitability.

Lastly, students, researchers and consultants will find this study useful as it will generate findings which the parties will compare with their own research outcomes and hence generate a major source of literature on mobile banking and banking.

1.6 Scope of the Study

The population of interest covered by this study consisted of Tier I Commercial Banks in Kenya whose offices are based in Nairobi. The study was carried out within a period of Four (4) months, between January to April 2018.

1.7 Limitations to the Study

During the study, some of the challenges and constraints that the study encountered included: limited availability of information and literature, inaccurate data, poor cooperation by respondents, gathering and interpreting background research and difficulties with getting appointments with interviewees. The study handled the challenge by working extra hours to finish up the project in time. During this study, a continuous, detailed and meticulous research was carried out.

The research came across uncooperative respondents who were unwilling to participate in the study. This challenge was minimized by assuring the respondents that no names of the participants would be used in reference to the study since the purpose of the research was only for academic purposes. The researcher also carried an introduction letter from the university as proof.

Some respondents refused to be interviewed claiming they lack time or challenge of getting most of the respondents in the offices to fill the questionnaires since they were in the field most of the time. The challenge was handled by leaving the forms for them to fill in later when they were back in the office.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter explores the existing literature relevant to the study as presented by various researcher and scholars'. The chapter covers the theoretical review, empirical literature, research gap, summary of the literature review, conceptual framework of variables and the operationalization of the variables. The review includes other scholar's work both at international and local scale. By pointing at the weaknesses and gaps of the previous researches, it will help support the current study with a view of suggesting possible viable measures or ways of filling them.

2.2 Theoretical Review

This section presents the theories upon which the current study is grounded on. This study is grounded on three theories namely the Diffusion of Innovation Theory and the Theory of Financial Intermediation.

2.2.1 Diffusion of Innovation Theory

Diffusion is the process by which an innovation is communicated through certain channels over a period of time among the members of a social system. An innovation is an idea, practice, or object that is perceived to be new by an individual or other unit of adoption. Communication is a process in which participants create and share information with one another to reach a mutual understanding (Rogers, 2009). Mahajan and Peterson (1995) defined the diffusion of innovation as the process by which the innovation is communicated through certain channels over time among members of social systems. This theory examines the adoption and uses of information technology from a diffusion of innovation perspective through mobile banking. Kleijnen, et al (2007) stated that not all innovations are adopted it depends on the level of their input. The Innovation-Decision Process Model suggests that the adoption of an innovation is not a single act, but a process that occurs over time. Potential adopters go through five stages when interacting with an innovation. The first stage is knowledge in which potential adopters find out about an innovation and gain a basic understanding of what it is and how it works. The second stage is persuasion in which potential adopters form a positive or negative impression of the

innovation. It is only in the third stage decision, that the innovation is adopted or rejected. The fourth stage, implementation, occurs when the innovation is used. In the fifth stage, confirmation, the adopter seeks information about the innovation and either continues or discontinues use of the innovation.

This theory sheds light on how users take up technology, for the study, the link that this theory provided was on mobile banking having an effect on increased customer base and its consequent effect on financial profitability.

2.2.2 The Theory of Financial Intermediation

Financial intermediation occurs when surplus units deposit funds with the financial institutions who in turn lend to deficit units. Financial intermediaries are facilitators of risk transfer and deal with increasingly complex financial instruments and markets. The role of financial intermediaries is that of creating specialized financial commodities (Scholtens & Wenseveen, 2003). This is more likely whenever an intermediary expects to cover both direct and opportunity costs from the price given. However, this needs to be done in an economic way 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 it is good to note that financial intermediation occurs only when the market is imperfect. When markets are perfect and complete, the allocation of resources is pareto efficient and there is no scope for intermediaries to improve welfare (Sullivan, 2000). The contrast between the theory and reality is in risk management. The change in the breadth of the markets available for hedging risk has not led very many individual and corporate customers to manage their own risks; rather it has meant that risk management has now been the central activity of many intermediaries. Cases of informational asymmetries, moral hazards and adverse selection are the main reason why financial intermediaries are important to reduce such risks (Nyanchama, 2015).

This theory shows the situations that lead to financial intermediation and the institutions that are created as a result. These institutions in order to meet the needs, they use tools. The use of tools used depend on aspects such as; mitigation against fraud and cybercrime, risk management

practices applied, and the security systems used. This study is measuring the effect of using mobile banking as a tool for financial intermediation and the various factors that affect it such as fraud, cybercrime, risk management and security systems.

2.3 Empirical Review

2.3.1 Perceived increased customer base and financial profitability

Customer satisfaction, Customer Retention AND Customer Loyalty are important factors in the performance and competitiveness of banks (Keisidou et al., 2013); (Belás, Chocholáková, & Gabčová, 2015). Compliance with the consumers' needs and requirements (Bilan, 2013), comprehensive customer care and the bank customers satisfaction is currently in the centre of attention of researchers and bankers (as it represents an important marketing variable for most of the companies (Munari et al., 2013). Customer loyalty leads to customer retention and eventually leads to increased and improved performance of the banks.

The adoption of new technologies improves efficiency, leads to growth in customer base, reduce transactions costs and time, improve service delivery and general improvement in performance and hence growing businesses and increased profitability which has encouraged a cashless society. The service delivery evolution has been witnessed by customers moving away from the traditional interpersonal service encounter to technology-based self-service which according to Asongu (2012), provides benefits to both the bank, as it reduces the transaction costs leading to increase in profits and to the customer there is increased convenience.

In the current banking sector, characterized by an increasing competition, efficient management of selling additional products and services to existing satisfied customers represents a significant opportunity to improve the financial performance of a commercial bank (Jaroslav and Lenka, 2016). Al-Jabir (2012) who studied mobile banking adoption by looking at the application of diffusion of innovation theory and established that 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. The increase in the number of users shows confidence among mobile banking users. This shows that commercial banks took keen interest in ensuring minimal risk exposure for their customers. Mutua (2015) also found out that the amount of money transacted through mobile banking and number of users maintained a positive increase. There is

also a directly positive relationship between number of mobile banking users and the amount of money moved through mobile banking over the study period.

Mobile banking serves to give the customers a new easier, convenient and quick approach to banking which most commercial banks are competing on to attract the largest customer base and in turn be able to increase profits. 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 banks because of the then small mobile banking customer base. He sought to determine the impact that mobile banking had on transaction costs of microfinance institutions as a way of measuring levels of competitiveness on micro finance institutions who had adopted mobile banking whereas this study is set to determine the effect of mobile banking on competitiveness of Commercial Banks. However, this study considered the effect on financial profitability given that the number of mobile banking customer base has drastically increased compared to the time the study was done.

Bichanga and Ali (2014) found out that electronic cash transfers does impact the expansion of the customer base among the Kenyan banks, through improvements in banking services availability to a bigger customer base across Kenya. They also found out that the implementation of the card systems has contributed towards an expanded customer's numbers by removing or rather address the impediments that hinder the spread of bank services among those exclude by banking institutions in the country. They further called for increased sensitization through all media outlets to create trust and reduce the security concerns and therefore ensure more people are aware of potential fraud among financial sector players.

2.3.2 Mitigating fraud and cybercrimes and financial profitability

Sharma and Panigrahi (2012) posit that fraud entails wrongful or criminal deception intended to result in financial or personal gain. The distinction between mobile frauds from the threats is in the purpose of the act. Mobile banking fraud is expressly concerned with financial deceptions and losses. Therefore, (Mudiri, 2012) defines mobile banking fraud in the context of mobile money as the intentional and deliberate action undertaken by players in the mobile financial services ecosystem aimed at deriving gain in cash or e-money, and/or denying other players revenue and/or damaging the reputation of the other stakeholders.

The fraud may be driven by the consumer, agents, business partners, system administrators or mobile financial service providers. Hoffmann and Birnbrich (2012) indicated that mobile banking fraud hurts more than just the financial position of both the banks and their customers. For example, (Gates & Jacob, 2009) posit that as the banks incur substantial operating costs by refunding customers' monetary losses, bank customers experience considerable time and emotional losses as they have to detect the fraudulent transactions, communicate them to their banks, initiate the blocking and re-issuance or re-opening of accounts, and dispute the reimbursement of their monetary losses (Hoffmann & Birnbrich, 2012).

According to KPMG Barometer 2012, Nigeria, Kenya, Zimbabwe and South Africa make up 74 percent of all fraud cases reported in Africa. In the East African region, Kenya in standing out with 7.75 percent of reported fraud cases, well ahead of Uganda (2.98 percent) and Tanzania (2.78 percent). Most fraud in Kenya targets government and financial sectors as elsewhere on the continent. Fraud and misappropriation is high, as is bribery and corruption (KPMG, 2012). Bank fraud in Kenya has increased and will continue to increase because it is a part of everyday life. According to data from the Banking Fraud Investigations Department (BFID), Kenyan banks lost KSh1.5 billion (approximately US$17.64 million) over the last year, with only a third being recovered by investigators. Several cases are pending in court or are still under investigation. Security experts say the amounts reported reflect only a small portion of the real losses suffered since banks prefer internal disciplinary measures in cases involving thieving employees (BFID, 2012).

Odhiambo (2013), indicates that cyber-crimes such as hacking, unauthorized withdrawals and unauthorized use of Credit or Debit Card are growing rapidly and pose a substantial risk to the stability of the overall financial sector. Attacks such as hacking and unauthorized withdrawals are increasing in number, scope, and sophistication, making it difficult to predict the total impact. There have also been increased cases of Unauthorized Use of Credit or Debit Card where credit and debit cards are stolen and used to access banks ATMs and other financial services or where people are kidnapped or coerced to make withdrawals from their bank accounts unwillingly. Banks and other financial institutions are increasingly concerned about the sharp increase in cyber-attacks and their consequences. Individual financial institutions have been investing heavily in control functions to counter these threats, increasing risk awareness and safeguarding critical assets and data. Authorities, in turn, have developed strategic initiatives, guidance papers

and regulatory approaches to combat cybercrime and to strengthen the resilience of the wider financial system. There are also various initiatives being developed around the world that promote intelligence gathering and information sharing between public and private sector stakeholders (which, together with data, are pre-requisites for cyber-insurability) (Boer & Vazquez, 2017).

Financial institutions are already employing many measures to reduce the impact of cyber-attacks, including: having a good understanding of cyber-resilience, adopting a comprehensive and forward-looking approach to manage cyber-risk, implementing the right controls and responsive actions available for mitigating a security failure, and engaging in swift cyber-threat information sharing. The transformation process that financial institutions, financial markets and financial infrastructures are undertaking to adapt to the new "digital future" will exacerbate cyber-risks. This can be seen, for example in: the increased number of processes, some of them critical, that banks are outsourcing to third parties, sometimes across borders; the more common use of the cloud for data or computing purposes; the increased interconnectivity with customers through multiple channels; the increased use of robotics or algorithms for automatic trading and the development of application programming interfaces (API); and, the increased use of virtual and digital currencies (Boer & Vazquez, 2017).

Though it appears the banking industry is one of the most profitable within the economy, higher performance could have been attained in terms of their performing a leading role in the reactivation of our economy, creation of wealth to her shareholders and rendition of social obligations to the larger society. The investigation agency, in its monthly crime reports, cited identity theft, electronic funds transfer, bad cheques, credit card fraud, loan fraud, forgery of documents and online fraud as some of the ways used to defraud financial institutions. Kenya's top five banks by profitability (Equity, Co-operative, Standard Chartered, KCB and Barclays) were the worst hit by 10 fraudsters. Of the 20 cases taken to court in April, 15 are shared among the top five banks as complainants. Most of the attempted or actual fraud involved amounts between Ksh 500,000 ($5,880) and Ksh4 million ($47,000). In 2012, Standard Chartered customers fell victim to the scam when they found anomalies, where withdrawals had been made from their accounts without their knowledge. The bank had to send cautionary messages to customers (Deloitte, 2013).

Abdulrasheed, Babaitu and Yinusa (2012) examined the impact of fraud on bank performance in Nigeria. The study revealed that Nigerian banks recorded the highest cases of fraud in 2008. Result of the study shows that, there is a significant relationship between banks profit and total amount of funds involved in fraud. Lastly, Adeyemo (2012) examined the nature, causes, effects and remedy for bank fraud in Nigeria. The study showed that the battle for reclusion, uncovering and retribution of fraud, offenders must be fought on two extensive fronts. First is to reduce the temptation to commit fraud and second is to increase the chances of detection.

2.3.3 Risk management practices and financial profitability

Kanchu and Kumar (2013) define risk management as a measure used to identify risk in advance, analyze and respond to a risk. Management of risk does not only involve reduction of chance of bad happenings but also ensuring the likelihood of good things occurring. Risk management is undoubtedly crucial in financial institutions such as commercial bank and it calls for keen attention from shareholders, regulators, practitioners and scholars since many huge losses are witnessed as result of poor risk management an organization (Imane, 2014). According to Bessis (2005) risk management is important to bank management because banks are 'risk machines' they take risks; they transform them and embed them in banking products and services. Risks are uncertainties resulting in adverse variations of profitability or in losses. Various risks faced by commercial institutions include; credit risk, market risks, interest rates risk, liquidity risk and operational risk (Shubhasis, 2005).

Shubhasis (2005) emphasized that risk management is important to bank management because banks are "risk machines" they take risks; they transform them and embed them in banking products and services. Therefore, banks should identify measure and control the credit risk, Ho and Yusoff (2009). In the banking industry, there exist many different types of risks that affect the performance and activities of banks. Risk class is deemed to be either systematic (market) or unsystematic risk or financial and non-financial risk. More specifically these classes contain distinct risks according to what causes them such as credit risk, liquidity risk, operational risk, market risk, political risk, currency risk, strategic risk among others (Imane, 2014). Imane (2014) examined risk management practices and financial performance in Islamic banking found out that liquidity, credit and operational risk management have negative and significant effect on

financial performance while market risk management showed a positive and significant with financial performance.

Laukkanen et al (2007) summarizes 18 factors into five barriers, namely Usage, Value, Risk, Tradition, and Image barriers. The theory of innovation resistance, adapted from the psychology and the IDT of Rogers (Rogers 2003), aims to explain why customers resist innovations even though these innovations were considered necessary and desirable. Through investigating 1525 usable respondents from a large Scandinavian bank, the study uncovered that the value and usage barriers were the most intense barriers to mobile banking adoption, while tradition barriers (such as preferring to chat with the teller and patronizing the banking office) were not an obstacle to mobile banking adoption.

Olamide, Uwalomwa & Ranti (2015) conducted a study in Nigeria on the effect of risk management on banks financial performance showed a negative and insignificant relationship between risk management proxies and banks performance. Ethiopia banks performance study as influenced credit risk management (Gizaw, Kebede & Selaraj, 2015) found that credit measure: non-performing loan, loan loss provision and capital adequacy had a significant effect on the profitability of commercial banks. But the study did not establish the nature of the relationship. Mwangi (2012) in Kenya studied the effect of credit risk management on commercial bank performance. He measured performance with return on equity (ROE) and performance was assessed using non-performing loan ratio (NPLR) and capital adequacy ratio (CAR). It was found out that both NPLR and CAR had a negative and relatively significant effect on ROE.

Adepoju and Alhassan (2010) showed that bank customers have come to depend on and trust the Automatic teller machine (ATM) to conveniently meet their banking needs, but that in recent times; there have been a proliferation of ATM frauds in the country. Managing the risks associated with ATM fraud as well as diminishing its impact is an important issue that face banks as fraud techniques have become more advanced with increased occurrences. According to Bessis (2005) risk management is important to bank management because banks are 'risk machines' they take risks; they transform them and embed them in banking products and services. Risks are uncertainties resulting in adverse variations of profitability or in losses. Various risks faced by commercial institutions include; credit risk, market risks, interest rates risk, liquidity risk and operational risk (Shubhasis, 2005).

Risks vary considerably. In an ideal world, the rate of return (and therefore potential profit) would increase with risk. The problems or complicating factors which obscure and distort that ideal relationship are: the perceived versus actual risk; unknown risks; and relative demand for the profit-yielding investment opportunity. Banks are very reluctant in lending to propositions by prospective customer that present any risk, without collaterals. Governments at federal and provincial level have special branches for lending money to people that have plausible ideas and products that have not yet been proven on the market. But they create sometimes more difficulties in lending than the banks. Banks have set up certain risk management techniques such as Passcodes and encryptions where people are required to use both letters in upper and lower case, numbers and symbols when choosing their passwords and encryptions. Commercial banks have come up with ways to mitigate risk in their systems through competition from new business models, pressure from financial technology companies, changing customer expectations, and systems back-up that ensures that no information is lost in case of systems failure.

2.3.4 Advanced security systems and financial profitability

Security and trustworthiness of a service was identified as one of the most important factors within every target customer segment when deciding on the use of a banking service delivery channel. Security is the biggest challenge facing the mobile banking world. The use of wireless technology creates a risk that information will be stolen, therefore service providers must employ the use of highly secure encryption technology to prevent third party data intrusion and losses. The mobility of the mobile handset and the nature of wireless communications make it difficult to authenticate a customer, hence this becomes a security concern for both banks and their customers. Early researchers' evidence and intuition alike suggests that trust plays a major role in use of the m-banking services (Porteous, 2007).

Mobile money empowers men and women by giving them the confidence and an independent place to store and control funds that is private and inaccessible to other members of the family. Kings (2011) noted that the value proposition for use of M-Pesa organizations focuses on several benefits and demerits which include corruption, increased operating efficiencies, including less paperwork, better transparency and accountability via the electronic records, and more independence and self-sufficiency for users. Ochuma (2007) on the other side laments that the

major concern in mobile banking is security and banks and vendors need to address this issue more urgently. He argues that the requirement that a customer needs to transact is personal identification number (PIN) which does not guarantee that the person transacting is the real card holder. It is therefore, important to additional security mechanisms. Banks have also put in place one time passwords (OTP), advanced security protocols and registered devices-Awareness that will send passwords and verification codes to mobile phones before one is able to access their accounts.

Ivatury & Pickens, (2006) have introduced a trust variable perceived credibility to predict m-banking adoption in Taiwan. Yet their modification also included another variable, self-efficacy and a form of trusting oneself. Generally, trust being a comprehensive concept may have to be handled carefully in any credible analysis of m-banking success (Benamati & Serva, 2007). People can trust the interface, the network across which their funds travel, the representatives of the institutions (channels) who control their money and/or the institutions themselves (Maurer, 2008). Mobile banking overview (January 2009) stated that, security issue must be addressed to encourage adoption of mobile banking in the following ways: data transmission must be secure in terms of confidentiality and therefore require encryption of the connection between the device and the bank. Application and data access must be controlled, whereby before users receive any sensitive information related to their bank accounts, a certain degree of verification must be completed.

Kariuki, (2015) carried out a study that used bank turnover and profits as measure of performance. The findings showed that there were positive impacts of security systems and ICT on the banking performance. He established that banks with high profit growth were more likely to be using greater numbers of advanced ICTs. He concluded that e-banking leads to higher profits though in long-term but not in short-term due to high ICT investment cost.

2.4 Summary of the Literature and Research gaps

The chapter reviewed related literature on the different theories of the study Diffusion of Innovation Theory and the Theory of Financial Intermediation. The chapter also reviewed empirical studies on the effect of mobile banking investment on financial profitability in Commercial Banks in Kenya. The chapter also discusses the research gaps as well as the

conceptual framework and the Operationalization of the Variables. Chapter three focuses on the research methodology.

From the foregoing literature review, it is still not clear whether mobile banking implementation leads to profitability in banks or not. Further, it is still not clear what levels of mobile banking implementation and what kinds of technologies produce significant effect on profitability. This gap exists both on researches in Kenya and in general. Most researchers focused on one bank (Adesola, et al., 2013) while others picked a group of banks randomly without a criterion (Gatawa, et al., 2013). From the empirical literature discussed, globally some scholars were not in agreement that mobile banking influences profitability of commercial banks as they noted that high spending on technological innovations by commercial banks can lower bank profits especially if the rate of adoption by users is not that fast. Also, excessive competition in the banking industry was seen to increase the probability of excessive risk taking by banks which in the end may affect their financial performance. In the local context, researchers reviewed the effect of mobile banking on performance of commercial banks, SMEs and micro finance institutions, where they agreed that mobile banking influenced performance of these financial institutions, but they did not look at the profitability aspects of commercial banks. But in this research, the exact effect of investment in mobile banking on tier 1 banks in Kenya will be evaluated, and the appropriate levels of mobile banking analyzed to draw accurate conclusions. The Banks profitability will be measured by analyzing the bank's audited financial records. The information to be collected includes Return on assets (ROA), Return on equity (ROE) and Net interest margin (NIM). This study aimed to bridge this gap by looking on the effect mobile banking investment on profitability of commercial banks in Kenya. In the following chapter, the research methodology is addressed, detailing the design, how data was collected from the tier 1 banks and how the collected data was analyzed and interpreted in order to come up with accurate conclusions that were discussed, and appropriate recommendations made.

2.6 Conceptual Framework

The conceptual framework is defined as an assumed model that helps in making out the study concepts as well as the relationships they have with each other (Mugenda & Mugenda, 2003). The conceptual framework is shown on Figure 2.1:

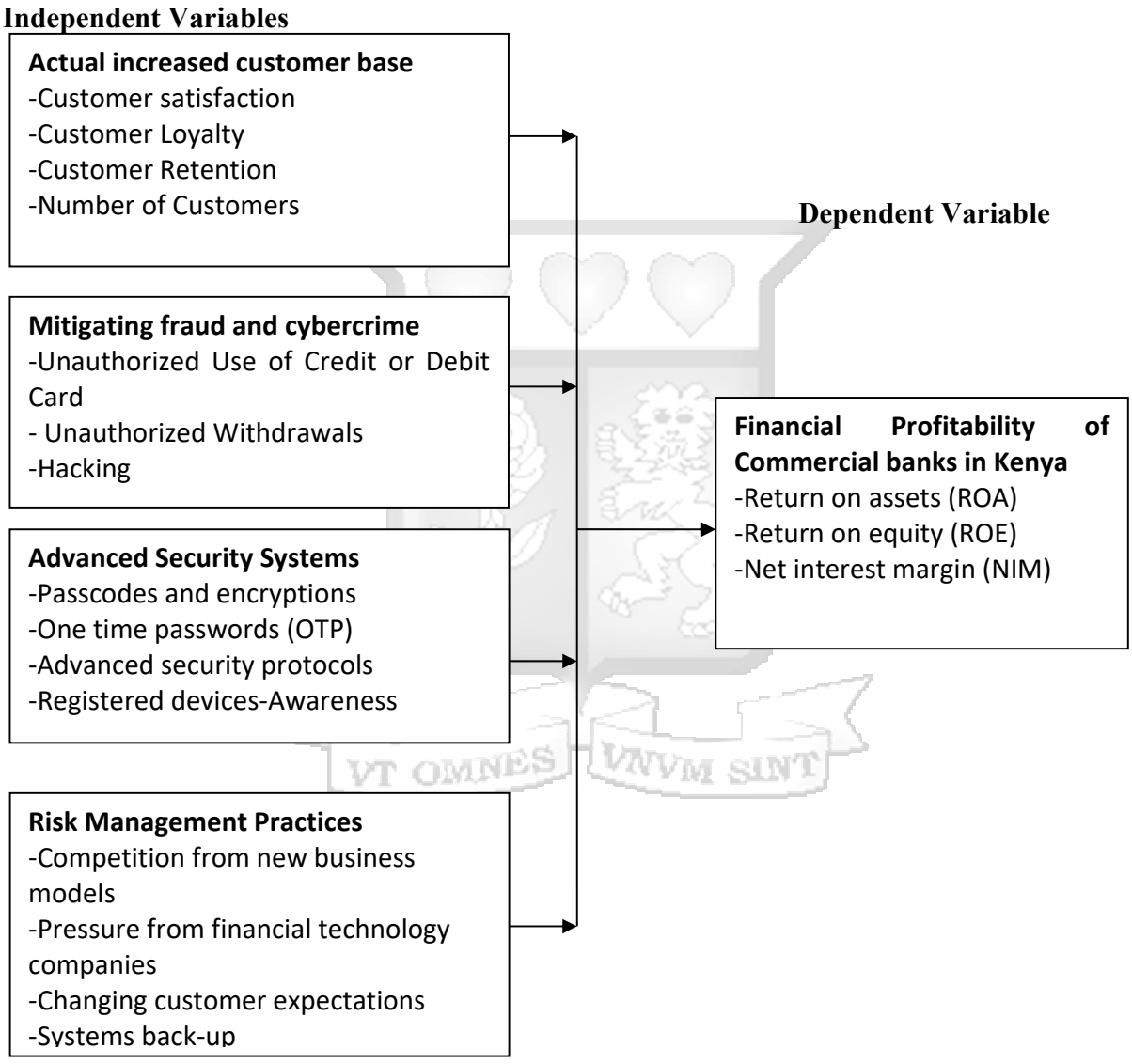

Figure 2.1: Conceptual Framework

2.6.1 Operationalization of the Variables

Table 2.1: Operationalization of the Variables

Variable	**Operational definition**	**Indicator/Measure**	**Measurement scale**
Financial Profitability	Efficiency of a company at generating more earnings than expenses incurred over the same period under consideration	-Return on Equity -Return on Assets -Net Interest Margin	Ordinal
Increase customer base	Increase in number of customers who are benefitting from a product or service	-Number of customers -Customer Satisfaction -Customer Loyalty	Continuous
Mitigating fraud and cyber crime	Reducing any activity that lead to dishonest or unfair dealing	-Unauthorized Use of Credit or Debit Card -Unauthorized Withdrawals -Hacking	Ordinal
Advanced Security systems	A security system consisting of a combination of hardware and software that limits the exposure of a computer or computer network to attack from crackers; commonly used on local area networks	-Passcodes and encryptions -One-time passwords (OTP) -Advanced security protocols -Registered devices	Ordinal

	that are connected to the internet.		
Risk management practices	The practice of identifying potential risks in advance, analyzing them and taking precautionary steps to reduce/curb the risk	-Competition from new business models -Pressure from financial technology companies -Changing customer expectations	Ordinal

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter introduces the design that was used for the research, and then discussed the population of study, sampling method and the sample size that were used. Data collection was then discussed, with a mention of the data collection tool that was used. A discussion then followed on how data collected was analyzed and presented. The next sections dealt with how research quality was achieved, majorly considering validity, objectivity and reliability. Finally, ethical considerations were discussed.

3.2 Research Design

The current study employed a descriptive research design. The purpose of descriptive research was to determine and report the way things are and it helps in establishing the current status of the population under study (Mugenda & Mugenda, 2003). The descriptive survey research designs are utilized both in preliminary and exploratory studies to let the researchers to collect information and give a summary, analyze, present and interpret the data collected for the core intention of clarification (Orodho, 2003). For this study, this research design was chosen because it helps in reducing bias while maximizing the reliability of gathered information. The descriptive research design tries to collect data from the public about their perceptions, values, behaviours and attitudes about the phenomena at hand (Nachmias & Nachmias, 2007).

3.3 Population

The unit of study for the research is tier one banks in Kenya. These banks are defined as banks that hold an asset base of Kenya Shillings 150 Billion and above (Central Bank of Kenya, 2018). These banks are Barclays, Standard Chartered, Kenya Commercial Bank, CFC Stanbic, Co-operative Bank, DTB Bank and Equity Bank. The banks were chosen for this study because of their asset base and because they are the largest banks in Kenya.

The total population for the research was the banks listed above. The respondents in these banks were all the staff in mobile banking, Finance and Sales departments, since the study touched on mobile banking, financial profitability and use of the technologies and they are directly involved

and are believed to be knowledgeable about the information that was needed for this study. Since the total population of the study was unknown at study proposal stage, the study used a sampling procedure for unknown total population to determine the sample.

3.4 Sampling Frame

A sampling frame is defined as a list of elements in the population from which the sample is drawn (Cooper & Schindler, 2010). In this study, the sampling frame was not used as we did not have the total number of employees of the banks under study.

3.5 Sample and Sampling Technique

To determine the sample population size, a statistical calculation was done (Saunders, 2012). Since the total population of the study is unknown, the study used the following sample determining formulae for unknown total population to determine the sample (Krejcie and Morgan, 1970). In the calculation method, n, the sample size was calculated using formula as:

$$n = (ZS/E)^2$$

Where:

- n is the sample size we wish to determine.
- Z is the confidence level, 95% is generally acceptable.
- S^2 is the standard deviation, usually from previous studies. If not known, 0.5 is a good estimator.
- E is the error limit we are willing to accept, an error limits within 5% is generally acceptable in research.

Therefore,

n = (0.95 *0.5) / (0.05) ^2 =190.

A sample size of 190 was used, distributed among the three divisions in the study banks, who were staff in mobile banking, Finance and Sales staff.

3.6 Data Collection Instrument

Questionnaires were used to collect data from the identified six banks. In each bank, three key sections or departments were identified, and the heads of these departments served as the

respondents to the study. The key departments for each of the banks were mobile banking, Finance and Marketing. To ensure quality of the research, data collected from the questionnaires were triangulated with those from face to face interviews.

To capture the interests of the respondents and ensure good quality of the results, structured questions were used. The structured questions consisted of closed, open ended and open response questions, making use of all measurement scales namely nominal, ordinal, interval and ratio scales. Such a mixture ensured the attention of the respondent is captured. The questionnaire had five sections to collect information on the four main objectives. Section A focused on demographics, Section B focused on perceived increased customer base, Section C focused on mitigating fraud and cybercrime, Section D focused on risk management practices and Section E focused on advanced security systems.

The study also used secondary data from the Audited Financial statements at the Bank and those deposited at the Nairobi Securities Exchange. The data was collected using data collection sheet which was edited, coded and cleaned. Data was mainly obtained covering the period between 31st January 2013 and 31st December 2017. Annual data was used in the analysis.

3.7 Data Collection Procedure

For this study, the researcher got a letter from the University to helped her introduce herself to the respondents as well as enabled her to collect data from the banks. She then personally distributed the questionnaires to the respondents and waited as they were filled. The researcher also had trained research assistants to help with the delivering of the research tools and they gave each respondent about five minutes or less to ensure the respondents have ample time to fill the questionnaires. The researcher explained the purpose of the study and offered guidance to the respondents on the way to fill in the questionnaire before administering the questionnaire. The questionnaires were filled, and assistance was sought where possible thus raising the reliability.

As for the busy respondents or those out of office, the questionnaires were administered through drop and pick method whereby the respondents were left with the questionnaire to fill in their convenient time. The researcher thereafter followed up by making subsequent visits and courtesy calls when necessary to remind the respondents to fill the questionnaires and in so doing increasing the response rate. The respondents were assured verbally that the information obtained from them will be treated with ultimate confidentiality. They were therefore requested

to provide the information truthfully and honestly. The study relied on data collected through a questionnaire structured to meet the objectives of the study.

3.8 Research Quality

Before administering the research instruments to the respondents, a pilot study was done to help in determining the validity and reliability of the research tools to ensure that the questions are applicable and clearly understandable. The pilot study of the instrument was done at 5% of the population. Cronbach's Coefficient Alpha approach was used as recommended by Cohen, Manion, and Morrison (2007), and Sekaran and Bougie (2013) to test reliability of the data. Cronbach's alpha coefficient ranges between 0 and 1 with higher alpha values of <0.5 being unacceptable, 0.5 to 0.6 being poor, 0.6 to 0.7 being questionable, 0.7 to 0.8 being acceptable, 0.8 to 0.9 being good, and above 0.9 being excellent. Four questionnaires were used for piloting. SPSS version 20.0 was used to calculate the reliability. The questionnaires were administred to the respondents and the test was done immediately after the data collection. The questionnaires were accepted at reliability indices of 0.816 (Table 3.1).

Table 3.1: Reliability Test

Reliability Statistics

Cronbach's Alpha	No of Items
0.816	28

3.9 Data Processing and Analysis

Data collected from the completed questionnaires were summarized, coded, tabulated and checked for any errors and omissions. Frequency tables, percentages and means were used to present the findings. A computer Statistical Package for Social Science (SPSS) version 20.0 was used to analyze the close-ended responses from the questionnaires while responses from the open-ended questions were analyzed and reported in a descriptive narrative manner as qualitative analysis. Quantitative data was analyzed using descriptive statistics including, averages, percentages, means and standard deviations. Analysis of Variance (ANOVA) was used to

analyze the data and the relationship between dependent and independent variables was analyzed. The effect of the intervening variables was also evaluated. Analyzed data was then presented in graphs, tables and charts.

Multiple regression analysis was performed to determine the relationship between mobile banking investment and profitability. This model was based on Kigen (2010) who analyzed the impact of mobile banking on transaction costs of microfinance institutions by looking at mobile banking adoption and the behavior of transaction costs and established that 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. The model is further supported by Kingoo (2011) in studying the relationship between electronic banking and financial performance of commercial banks in Kenya by looking at the wider electronic banking. The study used Return on Assets and Return on Equity as a measure of financial performance and overall operating cost as independent variable. This was represented as follows:

$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \varepsilon$

Where:

Y = Financial Profitability of commercial banks (ROE and ROA).

X_1 = Annual value moved through mobile banking

X_2 = Number of users of mobile banking

β_0 = constant

β_1, β_2 = Beta coefficients

$\boldsymbol{\varepsilon}$ = Error term

3.10 Ethical Considerations

As this research aims at adding to the knowledge of level of investment in mobile banking and profitability of commercial banks, it upheld utmost confidentiality about the respondents. The study made certain that all respondents are given free will to participate and contribute voluntarily to the study. The researcher also adhered to appropriate behaviour in relation to the rights of the respondents. A verbal consent was sought from the sample respondents before being interviewed. In addition, the study ensured that necessary research authorities are consulted, and

consent approved, and appropriate explanations specified to the respondents before commencement of the study.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

In this chapter the key issues related to data presentation, analysis and interpretation have been discussed. This chapter presents responses from all staff in mobile banking, finance and sales staff in the banks regarding 'Effect of mobile banking investment on Profitability'. First, the demographic characteristics of the participants have been described. Secondly, the findings on the four key objective areas of the study have been presented and interpreted. The responses were analyzed using descriptive and inferential statistics. The data has been presented in tables, graphs and pie charts.

Out of 190 questionnaires which had been administered to the respondents, 173 of them were returned for analysis. This translates to 91.1 percent return rate of the respondents. Overall, the response rate was considered very high and adequate for the study as shown in Table 4.1;

Table 4.1: Distribution of the Respondents by Responses Rate

Response Rate	**Issued (F)**	**Returned (%)**
Barclays Bank	27	22
Co-operative Bank	27	25
Standard Chartered Bank	27	25
KCB	27	27
Equity Bank	28	27
CFC Stanbic	27	23
DTB Bank	27	24
Issued	**190**	**173**

4.2 General Information of the Respondents

The study sought to find out the distribution of the bank employees by gender. The findings are given in Figure 4.1

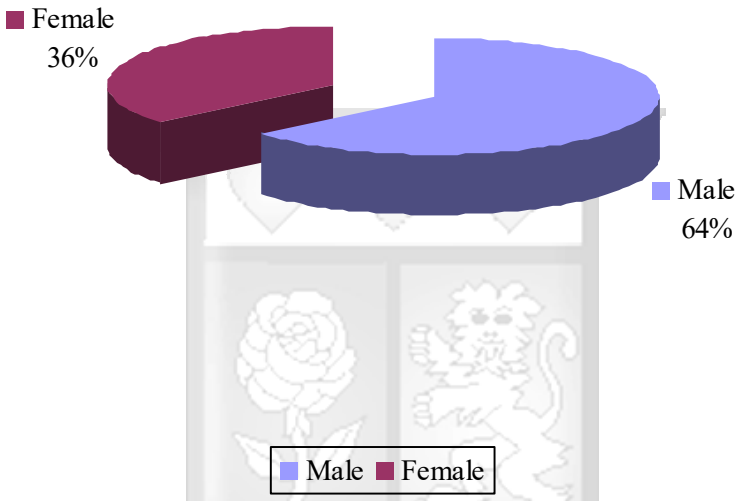

Figure 4.1: Distribution of respondents by Gender

Source: Researcher (2018)

According to the data shown in Figure 4.1, out of 173 respondents who participated in the study, (64.0.0%) the majority were male while 36.0% were female. The findings could be an indication that most of the in mobile banking, finance and sales staff of the banks are males.

The study sought to find out the distribution of the bank employees by age. The findings are given in Table 4.2

Table 4.2: Distribution of the bank employees by Age

Age	Frequency (F)	Percentage (%)
20-30 years	45	26.0

31-40 years	79	45.7
41-50 years	36	20.8
51 and above years	13	7.5
Total	**173**	**100.0**

It is evident from the data shown in Table 4.2 that, majority of the mobile banking, finance and sales bank staff (45.7%) fell under the age bracket of 31-40 years, 20-30 years (26.0%), 41-50 years (20.8%) and 51 and above years (7.5%). The findings reveal that the mobile banking, finance and sales staff in these banks comprises of middle-aged people.

The study sought to find out the distribution of the banking employees by education level. The findings are given in Figure 4.2

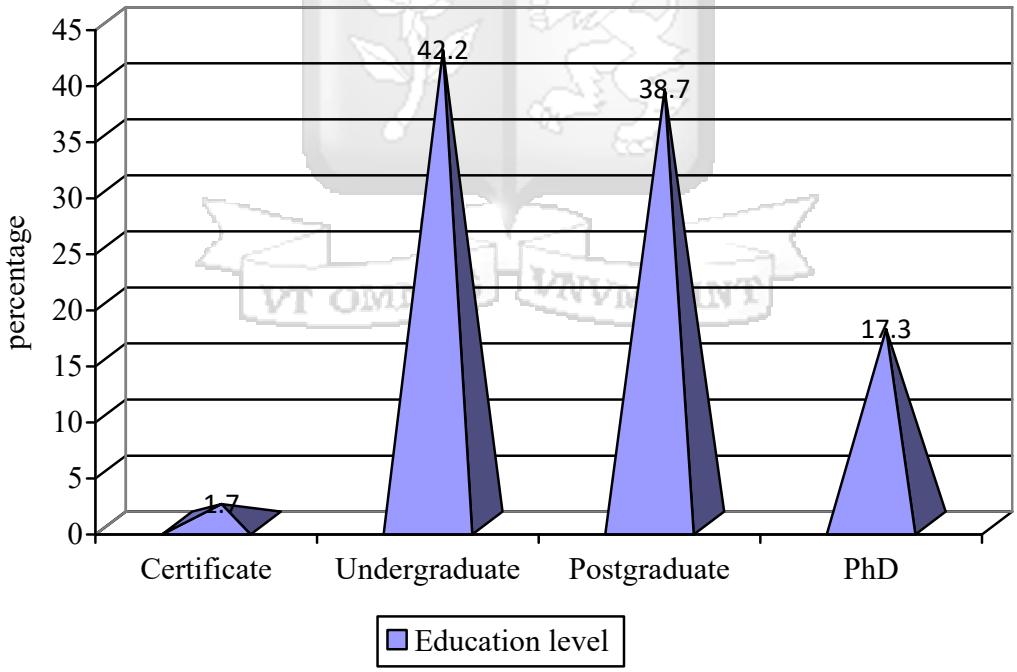

Figure 4.2: Distribution of the banking employees by education level

Source: Researcher (2018)

Figure 4.2 shows that majority of the respondents represented by 42.2% have attained undergraduate level of education 38.7% have attained postgraduate level of education, 17.3% have attained or pursuing PhD and 1.7% have attained certificate level of study. This implies that majority of the mobile banking, finance and sales staff in the banks have attained tertiary education.

The study sought to find out the distribution of the banking staff by years worked in the company. The findings are given in Figure 4.3

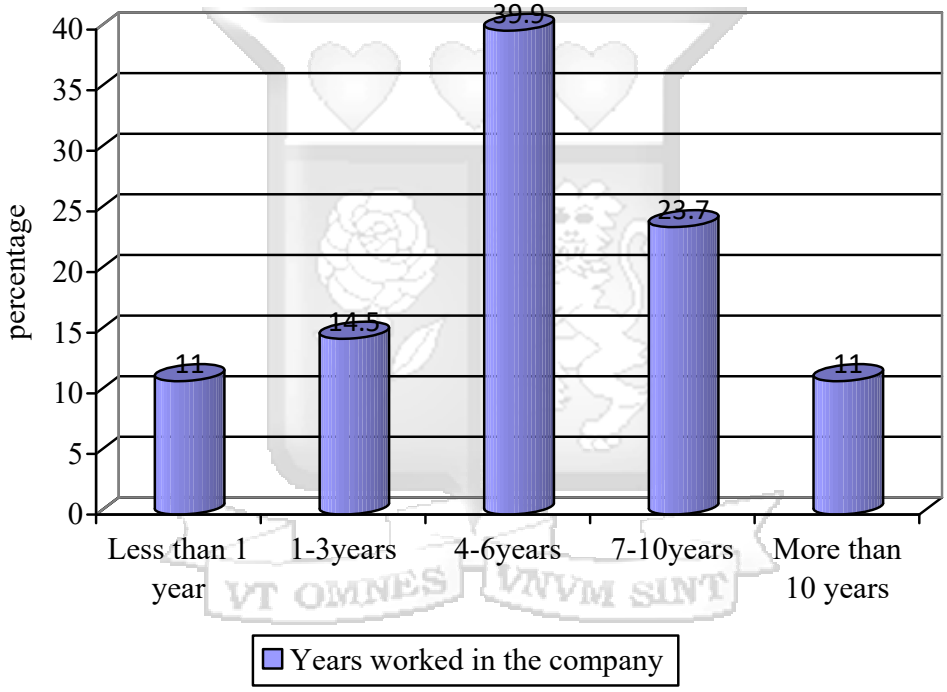

Figure 4.3: Years worked in the bank

Source: Researcher (2018)

Figure 4.3 shows that majority of the respondents represented by 39.9% have worked in the bank for 4-6 years, 23.7% for 7-10 years, 14.5% for 4-6 years, 11.0% for less than 1 year and 11.0% for more than 10 years.

The study sought to find out the career orientation of the respondent. The findings are given in Table 4.3

Table 4.3: Career Orientation

	Frequency (F)	Percentage (%)
Marketing	9	5.2
Business management	37	21.4
Finance	39	22.5
ICT	15	8.7
Economics	8	4.6
Accounting	42	24.3
Procurement	2	1.2
Engineering	3	1.7
Entrepreneurship	10	5.8
Actuarial science	4	2.3
Statistics	4	2.3
Total	**173**	**100.0**

The findings reveal that majority of the staff's career orientation is accounting (24.3%), finance (22.5%), business management (21.5%), ICT (8.7%), entrepreneurship (5.8%), marketing (5.2%), economics (4.6%), actuarial science (2.3%), statistics (2.3%), engineering (1.7%), procurement (1.2%).

4.3 Effect of perceived on increase of customer base on financial profitability

The study sought to find out if perceived increased customer base influences financial profitability of commercial banks in Kenya. The findings are shown below:

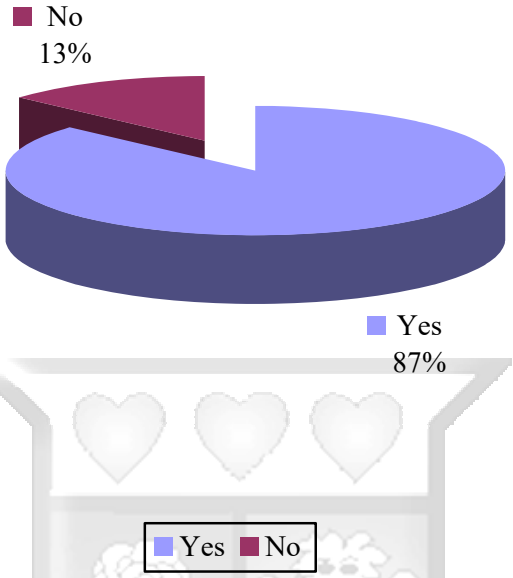

Figure 4.4: Influence of Perceived increased customer base financial profitability

Source: Researcher (2018)

It is evident from the data shown in Figure 4.4 that, majority of the staff (87.0%) agreed that perceived increased customer base influences financial profitability in their banks while 23.0% disagreed.

The study sought to find out the extent to which perceived increased customer base influence financial profitability in the banks. The findings are given in Figure 4.5

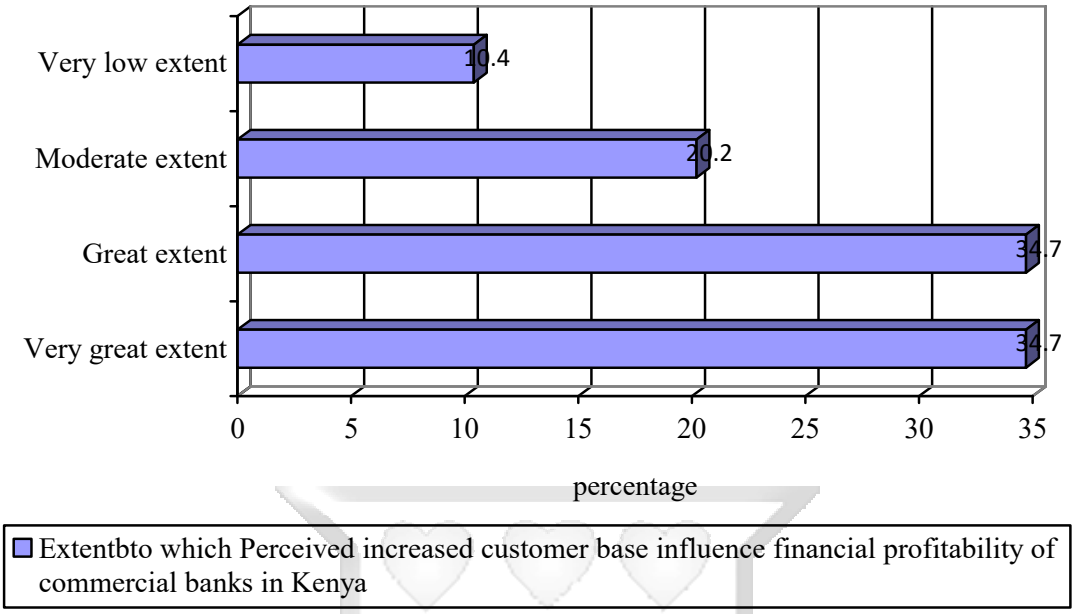

Figure 4.5: Extent to which perceived increased customer base influence financial profitability

Source: Researcher (2018)

The findings in Figure 4.5 shows that majority of the respondents represented by 69.4% cumulatively agreed that perceived increased customer base influence financial profitability of commercial banks in Kenya. The findings further show that 20% agreed to a moderate extent and 10.4% to a very low extent that perceived increased customer base influence financial profitability of commercial banks in Kenya.

The study sought to find out the level of agreement with the following statements regarding effect of perceived increased customer base on financial profitability of commercial banks. The findings are tabulated in Table 4.4.

Table 4.4: Level of agreement regarding Effect of Perceived increased customer base on financial profitability

	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)	Mean	SD	Rank
Increased Customer satisfaction	0.0	3.5	20.2	35.8	40.5	4.13	0.856	1
Increase in number of customers using mobile banking	6.9	5.2	11.0	28.3	48.6	4.06	1.197	2
The customers are loyal to the mobile banking services	1.7	8.1	17.9	34.7	37.6	3.98	1.020	3

The results in Table 4.5 indicate that, majority of banking staff strongly agreed with the statements that: increase in number of customers using mobile banking (48.6%), increased customer satisfaction (40.5%), and the customers are loyal to the mobile banking services (37.6%) as statements regarding effect of perceived increased customer base on financial profitability of commercial banks in Kenya. The findings further reveal 6.9% of the respondents strongly disagreed with the statement that increased customer satisfaction is an effect of perceived increased customer base on financial profitability of commercial banks in Kenya. The findings also show that the statement that 'Increased customer satisfaction' in the customers using mobile banking had the highest means of 4.13 and was ranked first while the customer loyalty on use of mobile banking services had the lowest mean of 3.98. This means that increased customer satisfactions was very important in commercial banks with regard to financial profitability.

4.4 Effect of mitigating fraud and cybercrime on financial profitability

The study sought to find out if mitigating fraud and cybercrime influence financial profitability in the banks. The findings are shown below:

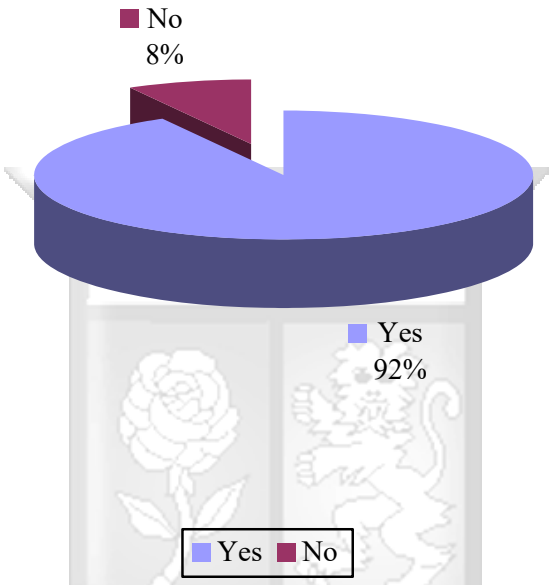

Figure 4.6: Influence of mitigating fraud and cybercrime financial profitability

Source: Researcher (2018)

It is evident from the data shown in Figure 4.6 that, majority of the staff (92.0%) agreed that mitigating fraud and cybercrime influences financial profitability in the banks while 8.0% disagreed.

The study sought to find out the extent to which mitigating fraud and cybercrime influence financial profitability in the banks. The findings are given in Figure 4.7

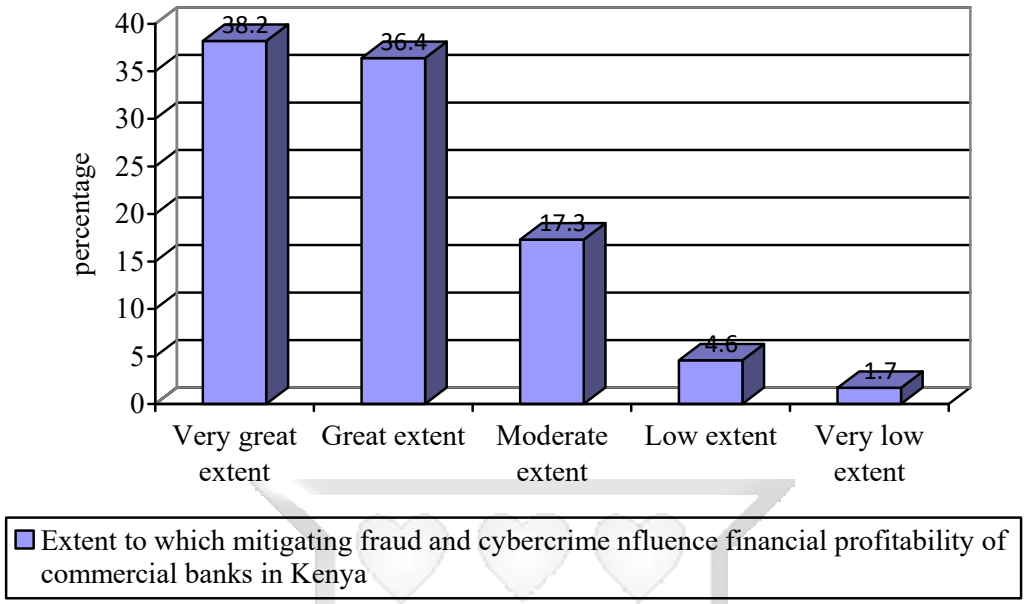

Figure 4.7: Extent to which mitigating fraud and cybercrime influence financial profitability

Source: Researcher (2018)

The findings in Figure 4.7 shows that majority of the respondents represented by 38.2% agreed to a very great extent that mitigating fraud and cybercrime influences financial profitability in the banks while 36.4% agreed to a great extent, 17.3% to a moderate extent, 4.6% to a low extent and 1.7% to a very low extent that mitigating fraud and cybercrime influences financial profitability in the banks.

The study sought to find out the level of agreement with the following statements regarding effect of mitigating fraud and cybercrime on financial profitability in the banks. The findings are tabulated in Table 4.5.

Table 4.5: Level of agreement regarding Effect of mitigating fraud and cybercrime on financial profitability

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	SD	Rank

	(%)	(%)	(%)	(%)	(%)			
Reduced use of Unauthorized Use of Credit or Debit Cards	1.7	4.0	14.5	47.4	32.4	3.76	1.215	3
Unauthorized Withdrawals have been reduced	1.7	17.3	14.5	24.3	42.2	4.05	0.888	1
Reduced cases of Hacking	8.7	6.9	15.6	37.6	31.2	3.89	1.187	2

The results in Table 4.5 indicate that, majority of banking staff agreed with the statements that: Reduced use of Unauthorized Use of Credit or Debit Cards (47.4%), and Reduced cases of Hacking (37.6%) as statements regarding effect of mitigating fraud and cybercrime on financial profitability in the banks. The findings further reveal 8.7% of the respondents strongly disagreed with the statement that reduced cases of hacking has an effect in mitigating fraud and cybercrime on financial profitability of commercial banks in Kenya. The findings also show that that the statement: unauthorized withdrawals have been reduced had the highest means of 4.05 and was ranked first while reduced use of unauthorized use of credit or debit cards had the lowest mean of 3.76.

4.5 Effect of investing in security systems on financial profitability

The study sought to find out if investing in security systems influences financial profitability of Tier 1 commercial banks in Kenya. The findings are shown below:

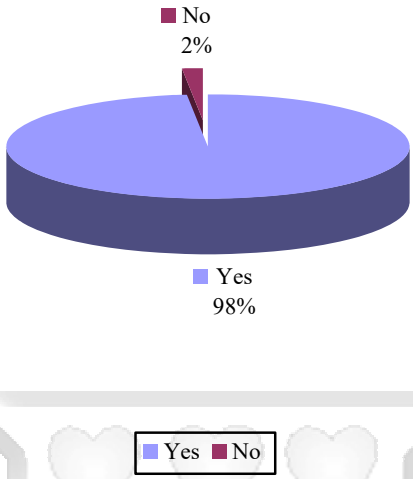

Figure 4.8: Influence of investing in security systems financial profitability

Source: Researcher (2018)

It is evident from the data shown in Figure 4.8 that, majority of the staff (98.0%) agreed that investing in security systems influences financial profitability in the banks while 2.0% disagreed.

The study sought to find out the extent to which investing in security systems influence financial profitability in the banks. The findings are given in Figure 4.9

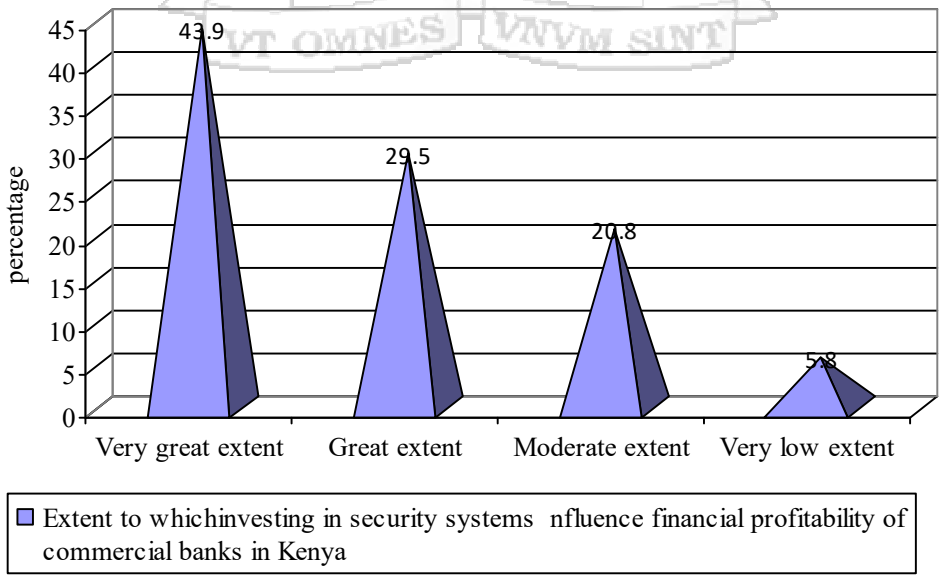

Figure 4.9: Extent to which investing in security systems influence financial profitability

The findings in Figure 4.9 shows that majority of the respondents represented by 43.9% agreed to a very great extent that investing in security systems influences financial profitability in the banks while 29.5% agreed to a great extent, 20.8% to a moderate extent, and 5.8% to a very low extent that investing in security systems influences financial profitability in the banks.

The study sought to find out the level of agreement with the following statements regarding effect of investing in security systems on financial profitability in the banks. The findings are tabulated in Table 4.6.

Table 4.6: Level of agreement regarding Effect of investing in security systems on financial profitability

	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)	Mean	SD	Rank
The bank has invested in unique passcodes and encryptions	3.5	8.1	11.0	32.4	45.1	4.08	1.094	3
The banks provide One-time passwords (OTP)	13.9	11.6	29.5	20.2	24.9	3.31	1.335	4
The bank has invested in advanced security protocols	0.0	11.6	14.5	27.2	46.8	4.09	1.036	2
The bank has ensured that all their customers use registered devices for their transactions by ensuring	5.2	8.1	11.0	23.1	52.6	4.10	1.194	1

they provide their mobile phone numbers before any transaction	

The results in Table 4.6 indicate that, majority of banking staff strongly agreed with the statements that: The bank has ensured that all their customers use registered devices for their transactions by ensuring they provide their mobile phone numbers before any transaction (52.6%), and the bank has invested in advanced security protocols (46.8%) as statements regarding effect of investing in security systems on financial profitability of commercial banks in Kenya. The findings further reveal 13.9% of the respondents strongly disagreed with the statement that the banks provide one-time passwords (OTP) is an effect of investing in security systems on financial profitability of commercial banks in Kenya. The findings also show that that the statement: The bank has ensured that all their customers use registered devices for their transactions by ensuring they provide their mobile phone numbers before any transaction had the highest means of 4.10 and was ranked first while the banks provide one-time passwords (OTP) had the lowest mean of 3.31.

4.6 Effect of risk management practices on financial profitability

The study sought to find out if risk management practices influences financial profitability of Tier 1 commercial banks in Kenya. The findings are shown below:

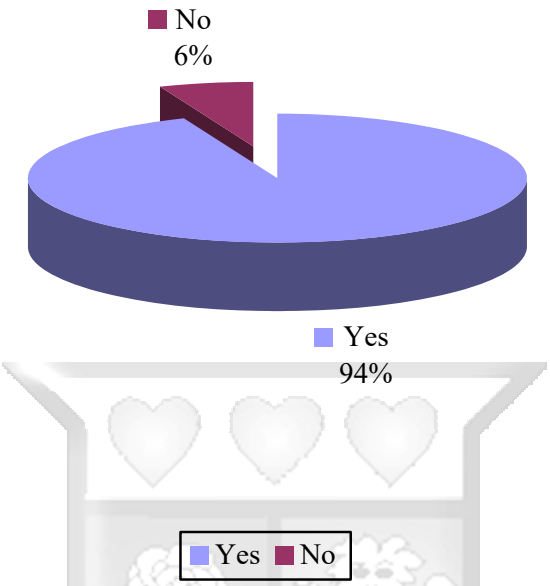

Figure 4.10: Influence of risk management practices financial profitability

Source: Researcher (2018)

It is evident from the data shown in Figure 4.10 that, majority of the staff (94.0%) agreed that risk management practices influence financial profitability in the banks while 4.0% disagreed.

The study sought to find out the extent to which risk management practices influence financial profitability. The findings are given in Figure 4.11

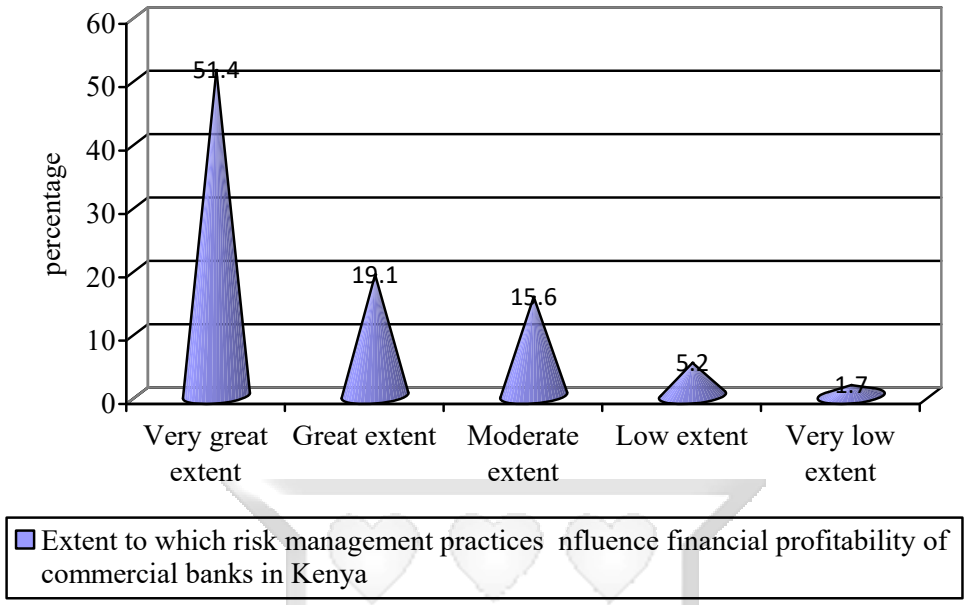

Figure 4.11: Extent to which risk management practices influence financial profitability

Source: Researcher (2018)

The findings in Figure 4.11 shows that majority of the respondents represented by 51.4% agreed to a very great extent that risk management practices influences financial while 19.1% agreed to a great extent, 15.6% to a moderate extent, 5.2% to a low extent and 1.7% to a very low extent that risk management practices influences financial profitability.

The study sought to find out the level of agreement with the following statements regarding effect of risk management practices on financial The findings are tabulated in Table 4.7.

Table 4.7: Level of agreement regarding Effect of risk management practices on financial profitability

	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)	Mean	SD	Rank
Competition from new business models	8.7	0.0	24.9	28.9	37.6	3.87	1.181	4
Pressure from financial technology companies	0.0	8.1	23.7	21.4	46.8	4.07	1.015	2
Changing customer expectations	0.0	8.7	19.7	32.9	38.7	4.02	0.967	3
System back-ups to prevent loss of customer information	3.5	6.4	11.0	37.6	41.6	4.08	1.046	1

The results in Table 4.6 indicate that, majority of banking staff strongly agreed with the statements that: Pressure from financial technology companies (46.8%), and System back-ups to prevent loss of customer information (41.6%) as statements regarding effect of risk management practices on financial profitability. The findings further reveal 13.9% of the respondents strongly disagreed with the statement that Competition from new business models is an effect of investing in risk management practices on financial profitability. The findings also show that that the statement: System back-ups to prevent loss of customer information had the highest means of 4.08 and was ranked first while competition from new business models had the lowest mean of 3.87.

4.7 Correlation Analysis

Table 4.8: Correlation Analysis

Correlations

		perceived increased customer base	mitigating fraud and cybercrime	investing in security systems	risk management practices
perceived increased customer base	Pearson Correlation	1			
mitigating fraud and cybercrime	Pearson Correlation	0.116	1		
investing in security systems	Pearson Correlation	0.052	0.039	1	
risk management practices	Pearson Correlation	0.097	0.199**	0.033	1

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

The Pearson's correlation co-efficient of financial profitability of Tier 1 commercial banks in Kenya and mitigating fraud and cybercrime is 0.116, investing in security systems (0.052) and risk management practices (0.097). These coefficients imply that there exists a positive association of financial profitability of Tier 1 commercial banks in Kenya and mitigating fraud and cybercrime (11.6%), investing in security systems (5.2%), and risk management practices (9.7%) to financial profitability of Tier 1 commercial banks in Kenya. This positive association suggests that when one increases, financial profitability of Tier 1 commercial banks in Kenya increase.

4.8 Regression Analysis

Regression analysis was used to model, examine, and explore the relationship between effect of mobile banking investment on profitability against the four independent variables (Monthly value moved through mobile banking and Number of users of mobile banking) used for the study, this was important in measuring the extent to which changes in one or more variables jointly affected changes in another variable.

Regression analysis was also used to generate an equation applied to the independent variables to best predict the dependent variable in the model. Each independent variable is associated with a regression coefficient describing the strength and the sign of that variable's relationship to the dependent variable. Analysis was done using SPSS version 20.0 to generate the model summary, Analysis of variance (ANOVA) and coefficients of regression. A model summary was generated providing the values of R, R Squared, Adjusted R Square and Standard error of the estimates for dependent and independent variables. The results are shown in Table 4.8.

4.8.1 Model Summary

Table 4.9: Model Summary results between profitability and the predictor variables

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.723	0.456	0.312	0.673

a. Predictors: (Constant), Monthly value moved through mobile banking, Number of users of mobile banking

The study used Table 4.8 to establish whether the dependent variable financial profitability has a linear dependence on the independent variables namely Monthly value moved through mobile banking, Number of users of mobile banking. The correlation coefficient (R) measures the strength and direction of a linear relationship between two variables. The study established a correlation value of 0.723. This depicts a strong linear dependence between the two variables. The R-squared indicates the coefficient of determination, which is the proportion of variance in the dependent variable that can be explained by independent variables. An R-square value of 0.456 was established and adjusted to 0.312. The coefficient of determination depicts that 45.6% of the variations in financial profitability can be explained by the R square meaning that there are other factors that affect financial profitability of tier one banks in Kenya.

4.7.2 ANOVA

Analysis of Variance (ANOVA) was used to determine the linear relationship among the variables under investigation. Using this method, the sum of squares, degrees of freedom (df), mean square, value of F (calculated) and its significance level was obtained. The results are shown in Table 4.9.

Table 4.10: Summary of One-Way ANOVA results between profitability and the predictor variables

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.927	2	3.115	6.929	.017[b]
	Residual	14.842	2	1.468		
	Total	21.391	4			

a. Dependent Variable: Financial Profitability

b. Predictors: (Constant), Monthly value moved through mobile banking, Number of users of mobile banking

Analysis of Variance was used to test the significance of the regression model as pertains to significance in the differences in means of the dependent and independent variables. The table 4.9 shows that the independent variables statistically predicts the dependent variable (2, 4) =0.017, $p<0.05$ (i.e. the regression model is a good fit for the data and is significant).

4.8.3 Coefficients

Table 4.11: Regression coefficients of the relationship between mobile banking and profitability of commercial banks in Kenya

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.538	0.219		3.195	0.002
	Monthly value moved through mobile banking	0.781	0.200	0.222	.6.720	.019
	Number of users of mobile banking	0.841	0.341	0.390	4.120	.032

a. Dependent Variable: Financial Profitability

Table 4.10 shows the constant in this model is represented by a value of 1.538, which is the expected value of effect of mobile banking investment on profitability when the values of the independent variables are equal to zero. Monthly value moved through mobile banking was found to have a value of (0.781) while Number of users of mobile banking had a value of (0.841). The findings presented also show that taking all other independent variables at zero, a unit increase in the annual amount of money moved through mobile banking would lead to a 0.781 increase in the scores of profitability of commercial banks in Kenya, a unit increase in the scores of number of users of mobile banking would lead to a 0.841 increase in the scores of profitability of commercial banks in Kenya, From the coefficients Table, it is evident that the p-values for Monthly value moved through mobile banking Monthly value moved through mobile banking (0.019), and Number of users of mobile banking (0.032) are less than 0.05. This therefore means that Monthly value moved through mobile banking and Number of users of mobile banking are statistically significant, and it therefore influences the overall Financial

Profitability of the Tier 1 commercial banks. Overall, number of users of Mobile Banking had the greatest effect on profitability of commercial banks in Kenya, followed by annual amount of money moved through mobile banking on profitability of commercial banks in Kenya. All the variables were significant ($p<0.05$).

Therefore, the regression model is as follows:

$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \varepsilon$

Where:

Y = Financial Profitability of commercial banks (ROE and ROA).

X_1 = Annual value moved through mobile banking

X_2 = Number of users of mobile banking

β_0 = constant

β_1, β_2 = Beta coefficients

ε = Error term

Therefore,

$Y = 1.538 + 0.781X_1 + 0.841X_2 + 673$

5. CHAPTER FIVE

5.0 SUMMARY, DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The basic purpose of this chapter is to give the summary of the findings, discussions, conclusions and recommendations of the study. This was based on the research findings that is presented and discussed in the previous chapters. The study established several findings which make a direct contribution to knowledge and policy formulation. Recommendations both for further research as well as policy and practice have been made.

5.2 Discussion of the result

This study aimed at examining the effect of mobile banking investment on profitability in Tier 1 commercial banks. The task included to; determine the effect of perceived increased customer base on financial profitability of commercial banks in Kenya; evaluate the effect of mitigating fraud and cybercrime on financial profitability of commercial banks in Kenya; find out the influence of risk management practices on financial profitability of commercial banks in Kenya and establish the establish the effect of advanced security systems on financial profitability of commercial banks in Kenya. The study reviewed previous studies with a view to establish academic gaps which the present study sought to bridge. This was done through library research.

This study adopted a descriptive survey design and employed quantitative research as the main approach to guide the study. The study targeted all the staff in mobile banking, Finance and Sales staff in the tier one banks, namely Barclays, Standard Chartered, Kenya Commercial Bank, CFC Stanbic, Co-operative Bank, DTB Bank and Equity Bank. The research instrument used in data collection was a questionnaire to draw information from the respondents. To ensure validity of the instruments, expert opinion was sought. Data analysis was started immediately after the field. Data was summarized into frequencies and percentages and presented in tables and charts and figures. This section comprises of discussions based on the specific research objectives of the study.

The study findings reveal that majority of the banking staff are male aged between 31-40 years old and have attained undergraduate level of education. The study findings further reveal that

majority of the respondents have worked in the bank for 4-6 years and that majority of the banking staff career orientation is accounting.

5.2.1 Effect of Perceived increased customer base on financial profitability

The study findings reveal that majority of the banking staff agreed that perceived increased customer base influence financial profitability of Tier 1 commercial banks in Kenya. Majority of the respondents cumulatively agreed that perceived increased customer base influence financial profitability of Tier 1 commercial banks in Kenya to a great extent. The findings further reveal that majority of banking staff strongly agreed with the statements that: increase in number of customers using mobile banking, increased customer satisfaction, and the customers are loyal to the mobile banking services as statements regarding effect of perceived increased customer base on financial profitability of Tier 1 commercial banks in Kenya. The findings also show that the statements requests increase in number for customers using mobile banking which had the highest mean of 4.13 and was ranked first while the customers are loyal to the mobile banking services had the lowest mean of 3.98.

5.2.2 Effect of mitigating fraud and cybercrime on financial profitability

The study findings reveal that majority of the staff agreed that mitigating fraud and cybercrime influences financial profitability of Tier 1 commercial banks in Kenya. Majority of the respondents agreed to a very great extent that mitigating fraud and cybercrime influences financial profitability of Tier 1 commercial banks in Kenya. The findings also show that majority of banking staff agreed with the statements that: Reduced use of Unauthorized Use of Credit or Debit Cards, and Reduced cases of Hacking as statements regarding effect of mitigating fraud and cybercrime on financial profitability of Tier 1 commercial banks in Kenya. The findings also show that that the statement: Unauthorized Withdrawals have been reduced had the highest means of 4.05 and was ranked first while Reduced use of Unauthorized Use of Credit or Debit Cards had the lowest mean of 3.76.

5.2.3 Effect of investing in security systems on financial profitability

The study findings reveal that majority of the staff agreed that investing in security systems influences financial profitability of Tier 1 commercial banks in Kenya. Majority of the respondents agreed to a very great extent that investing in security systems influences financial profitability of Tier 1 commercial banks in Kenya. The findings further reveal that majority of banking staff strongly agreed with the statements that: The bank has ensured that all their customers use registered devices for their transactions by ensuring they provide their mobile phone numbers before any transaction, and the bank has invested in advanced security protocols as statements regarding effect of investing in security systems on financial profitability of Tier 1 commercial banks in Kenya. The findings also show that that the statement: The bank has ensured that all their customers use registered devices for their transactions by ensuring they provide their mobile phone numbers before any transaction had the highest means of 4.10 and was ranked first while the banks provide one-time passwords (OTP) had the lowest mean of 3.31.

5.2.4 Effect of risk management practices on financial profitability

The study findings reveal that majority of the staff agreed that risk management practices influence financial profitability of Tier 1 commercial banks in Kenya. Majority of the respondents agreed to a very great extent that risk management practices influences financial profitability of Tier 1 commercial banks in Kenya. The findings further reveal that majority of banking staff strongly agreed with the statements that: Pressure from financial technology companies, and System back-ups to prevent loss of customer information as statements regarding effect of risk management practices on financial profitability of Tier 1 commercial banks in Kenya. The findings further reveal that a proportion of the respondents strongly disagreed with the statement that Competition from new business models is an effect of investing in risk management practices on financial profitability of Tier 1 commercial banks in Kenya. The findings also show that that the statement: System back-ups to prevent loss of customer information had the highest means of 4.08 and was ranked first while Competition from new business models had the lowest mean of 3.87.

The findings reveal that that the independent variables statistically predicts the dependent variable (2, 4) =0.017, $p<0.05$ (i.e. the regression model is a good fit for the data and is

significant). The study findings also reveal that number of users of Mobile Banking had the greatest effect on profitability of commercial banks in Kenya, followed by annual amount of money moved through mobile banking on profitability of commercial banks in Kenya. All the variables were significant ($p<0.05$).

The study findings reveal that the correlation coefficients imply that there exists a positive association perceived increased customer base, mitigating fraud and cybercrime, investing in security systems, and risk management practices to financial profitability of Tier 1 commercial banks in Kenya. This positive association suggests that when one increases, financial profitability of Tier 1 commercial banks in Kenya increase. This positive association suggests that when one increases, financial profitability of Tier 1 commercial banks in Kenya increase.

5.3 Summary of the Results

The study findings reveal that majority of the banking staff agreed that procurement practices influence supply chain performance of supermarkets in Nairobi, Kenya agreed that perceived increased customer base influences financial profitability of Tier 1 commercial banks in Kenya. Majority of the respondents cumulatively agreed that perceived increased customer base influence financial profitability of Tier 1 commercial banks in Kenya to a great extent. The findings are in line with Keisidou et al., (2013) who affirms that customer satisfaction is an important factor in the performance and competitiveness of banks. Mobile banking serves to give the customers a new easier, convenient and quick approach to banking which most commercial banks are competing on to attract the largest customer base and in turn be able to increase profits. 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 banks because of the then small mobile banking customer base.

The study findings reveal that majority of the staff agreed that mitigating fraud and cybercrime influences financial profitability of Tier 1 commercial banks in Kenya. Majority of the respondents agreed to a very great extent that mitigating fraud and cybercrime influences financial profitability of commercial banks in Kenya. Sharma and Panigrahi (2012) posit that fraud entails wrongful or criminal deception intended to result in financial or personal gain which is in line with the findings. The distinction between mobile frauds from the threats is in

the purpose of the act. Mobile banking fraud is expressly concerned with financial deceptions and losses. The fraud may be driven by the consumer, agents, business partners, system administrators or mobile financial service providers. Hoffmann and Birnbrich (2012) indicated that mobile banking fraud hurts more than just the financial position of both the banks and their customers. Financial institutions are already employing many measures to reduce the impact of cyber-attacks, including: having a good understanding of cyber-resilience, adopting a comprehensive and forward-looking approach to manage cyber-risk, implementing the right controls and responsive actions available for mitigating a security failure, and engaging in swift cyber-threat information sharing.

The study findings reveal that majority of the staff agreed that investing in security systems influences financial profitability of Tier 1 commercial banks in Kenya. Majority of the respondents agreed to a very great extent that investing in security systems influences financial profitability of commercial banks in Kenya. The findings support in Imane, (2014) who asserts that risk management is undoubtedly crucial in financial institutions such as commercial bank and it calls for keen attention from shareholders, regulators, practitioners and scholars since many huge losses are witnessed as result of poor risk management an organization. Management of risk does not only involve reduction of chance of bad happenings but also ensuring the likelihood of good things occurring. Risk management is undoubtedly crucial in financial institutions such as commercial bank and it calls for keen attention from shareholders, regulators, practitioners and scholars since many huge losses are witnessed as result of poor risk management an organization (Imane, 2014).

The study findings reveal that majority of the staff agreed that risk management practices influence financial profitability of Tier 1 commercial banks in Kenya. Majority of the respondents agreed to a very great extent that risk management practices influences financial profitability of Tier 1 commercial banks in Kenya. The findings support Kings (2011) who noted that the value proposition for use of M-Pesa organizations focuses on a number of benefits and demerits which include corruption, increased operating efficiencies, including less paperwork, better transparency and accountability via the electronic records, and more independence and self-sufficiency for users. Mobile money empowers men and women by giving them the confidence and an independent place to store and control funds that is private and inaccessible to other members of the family. People can trust the interface, the network across which their funds

travel, the representatives of the institutions (channels) who control their money and/or the institutions themselves (Maurer, 2008).

The study findings reveal that there were mobile banking variables influencing the profitability of commercial banks in Kenya. They include annual amount of money moved through mobile banking, and number of users of mobile banking. They influenced mobile banking positively. The study found out that the intercept was 1. 538 for all the years. The study established that the coefficient for annual amount of money moved through mobile banking was 0.781, meaning that annual amount of money moved through mobile banking positively and significantly influenced the profitability of commercial banks in Kenya. This is in line with Gakure and Ngumi (2013) who showed that combined effect of the bank innovations research is statistically significant in explaining the profits of commercial banks in Kenya. In addition, Simpson (2002) expressed that mobile banking is driven largely by the prospects of operating costs minimization and operating revenues maximization and that a comparison of mobile banking in developed and emerging markets revealed that in developed markets lower costs and higher revenues are more noticeable.

The study also established that the coefficient for number of users of mobile banking was 0.841, meaning that number of users of mobile banking positively and significantly influenced the profitability of commercial banks in Kenya. This correlates with Mattila (2002) findings that using mobile phone in banking is trustworthy. Agboola (2006) people trust the interface, the network across which their funds travel, the representatives of the institutions (channels) who control their money and/or the institutions themselves. On the other hand, Jayawardhena and Foley (2000) also showed that internet banking results in cost and efficiency gains for consumers and banks yet very few banks were using it and only a little more than half a million customers were using online banking in the United Kingdom (U.K). In addition, Donner and Tellez (2008) 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.

5.4 Conclusion

The study sought to examine the effect of mobile banking investment on profitability of Tier 1 commercial banks in Kenya. The study concludes that level of investment in mobile banking have an influence on financial profitability of Tier 1 commercial banks in Kenya. The study also

concludes that: Monthly value moved through mobile banking and Number of users of mobile banking influence financial profitability of Tier 1 commercial banks in Kenya to a very great extent. The study concludes that annual amount of money moved through mobile banking positively and significantly influenced the profitability of commercial banks in Kenya. This could be credited to the trends recorded in the variable where the annual amount of money moved through mobile banking had a positive and significant influence to profitability of commercial banks in Kenya. The study also concludes that the number of users of mobile banking positively and significantly influenced the profitability of commercial banks in Kenya. This could be attributed to the trends recorded in the variable where number of users of mobile banking had a positive and significant influence on profitability of commercial banks in Kenya.

Therefore, this study concludes that there exists a positive association between perceived increased customer base, mitigating fraud and cybercrime, investing in security systems, and risk management practices that suggest that when one increases, financial profitability of Tier 1 commercial banks in Kenya increase.

5.5 Recommendations

5.5.1 Suggestions for Improvements

On the basis of the above, conclusions, the following recommendations were made for the effect of the level of investment in mobile banking on profitability of Tier 1 commercial banks in Kenya.

The study recommends need for policy makers consider mobile banking in their formulation of policies because of the technological developments and the expected switch from physical branch networks to technologically supported banking services. This is because despite the apparently negligible relationship between mobile banking and profitability of Tier 1 commercial banks in Kenya, the impact could be more pronounced if much change is recorded in technological developments and more customers adopt mobile banking services. This is because the relationship may not be direct but an indirect one resulting from the convenience that the mobile banking services offers to commercial banks and its customers.

The study recommends that the management of the Tier 1 commercial banks in Kenya should partner with the telecommunication players to achieve synergy in broadening and accelerating

the adoption of mobile banking in Kenya for enhanced financial performance. The study also recommends that commercial banks should find ways of growing their market share in the Kenyan banking industry as this provides them with more customers for mobile banking.

The study suggests that the banking sector should enhance the suitability and acceptance of mobile banking to the retail sector in the country. By promoting the acceptance of mobile banking as an avenue through financial services can be delivered, it will become easier for consumers to commensurate with consumption of such services. Although this is a slow process, it will provide significance of mobile banking to the overall performance of the commercial banking sector in the country.

There is need for commercial banks to seek ways of growing their asset base in order to make it possible to invest in mobile banking as well as support the platforms in an efficient manner. This will in turn result in improved financial profitability as shown in the study. The commercial banks need to maintain their technology to ensure the related malware risks are continuously avoided. There also is a need to beef up the set-up ensure cases of system hacking by radical programmers. There is also a need to set up heavy in regard to unauthorized access and mobile fraud

The study recommends that commercial banks in Kenya should put in place fraud detection mechanisms by setting up an efficient, reliable and working fraud detection department to oversee all the transactions that are considered prone to fraud to minimize the vice for them to maximize profits for better financial performance. Other mechanisms considered viable for minimizing banks financial fraud should be put in place. Commercial banks must also seek to reduce risk perceived by their customers by offering specific guarantees protecting them and taking their complaints seriously and urgently.

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.

5.5.2 Suggestions for Further Research

This study sought to examine the effect of mobile banking investment on profitability of Tier 1 commercial banks in Kenya attempting to bridge the gap in knowledge that existed. Although the study attained these, it mainly focused on Tier One commercial banks in Kenya and within Nairobi County. There is need to conduct a similar study in other banks and other financial institutions in an attempt to compare the findings. There is also a need to conduct a study on the challenges faced when adoption of mobile banking in commercial banks in Kenya.

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APPENDICES

APPENDIX ONE: INTRODUCTION LETTER

The ICT Director,

Kenya Commercial Bank Group Ltd.

Tel: 254 (20) 3270199, Nairobi.

January 10, 2018.

Dear Sir,

Survey in your bank: Effect of mobile banking investment on Profitability.

This survey is being carried out by the undersigned who is a student at Strathmore Business School, Master of Business Administration programme. The main objective of the study is to determine whether the level of investments that your bank makes on Information and Communication Technology has an effect on profitability of your bank. The findings of this study will be for academic purposes. Further, the findings will also help your bank in making strategic decisions in terms or investments in mobile banking.

Strict confidentiality will be maintained before, during and after the study. Your name or the name of your bank will be coded and will not be mentioned anywhere in the report. Participation in this study is entirely voluntary and you are free to opt out at any time.

Kindly answer all questions. It takes about five minutes of your time. There are no costs associated with this survey, other than your time. Once completed, one of our researches will pick the completed questionnaire from your office. We request for a completion date no later than February 25th, 2018 and will call your office for confirmation.

Should you have any questions regarding this survey, please do not hesitate to contact the undersigned.

Thank you for your time and looking forward to receiving the completed questionnaire from you.

Catherine Waiganjo;

Strathmore Business School

0710 602 547; katewaiganjo@gmail.com

APPENDIX II: STRUCTURED QUESTIONNAIRE

This questionnaire is designed to collect data on Effect of mobile banking investment on Financial Profitability of Commercial Banks in Kenya. Kindly complete the following questionnaire using the instructions provided for each set of question. Tick appropriately. Instructions: Please tick as appropriate. Do not write your name on this questionnaire.

PART A: Respondent's Background Information

1. What is your gender?

[ ] Male [ ] Female

2. In which of the following age brackets does your age fall?

[ ] 20-30 years [ ] 31-40 years [ ] 41-50 years [ ] 50 and above

3. State your highest education level

[ ] Certificate [ ] Diploma [ ] Undergraduate

[ ] Post Graduate [ ] PhD [ ] Other _____

4. How many years have you worked with the Bank?

[ ] Less than 1year [ ] 1-3 years [ ] 4-6 years [ ] 7-10 years

[ ] More than 10 years

5. What is your career orientation?

[ ] Marketing [ ] Business Management [ ] Finance

[ ] ICT [ ] Economics [ ] Other _____

PART B: Effect of Perceived increased customer base on financial profitability of commercial banks in Kenya

7. In your opinion, does Perceived increased customer base influence financial profitability of commercial banks in Kenya?

[ ] Yes [ ] No

To what extent

[ ] To a very great extent [ ] To a great extent [ ] To a moderate extent

[ ] To a low extent [ ] To a very low extent

8. On a scale of 1 to 5, where 1=strongly disagree; 2=disagree; 3=neutral; 4=agree; and 5=strongly agree, kindly indicate your level of agreement with the following statements that are related to effect of Perceived increased customer base on financial profitability of commercial banks in Kenya.

No.	Questions	1	2	3	4	5
1	Increased Customer satisfaction					
2	Increase in number of customers using mobile banking					
3	The customers are loyal to the mobile banking services					

9. Any other comments regarding the effect of Perceived increased customer base on financial profitability of commercial banks in Kenya?

_____

_____

_____

PART C: Influence of Mitigating fraud and cybercrime on financial profitability of commercial banks in Kenya

10. In your opinion, does mitigating fraud and cybercrime influence financial profitability of commercial banks in Kenya?

[ ] Yes [ ] No

To what extent

[ ] To a very great extent [ ] To a great extent [ ] To a moderate extent

[ ] To a low extent [ ] To a very low extent

11. On a scale of 1 to 5, where 1=strongly disagree; 2=disagree; 3=neutral; 4=agree; and 5=strongly agree, kindly indicate your level of agreement with the following statements that are related to influence of mitigating fraud and cybercrime on financial profitability of commercial banks in Kenya.

No.	Questions	1	2	3	4	5
1	Reduced use of Unauthorized Use of Credit or Debit Cards					
2	Unauthorized Withdrawals have been reduced					
3	Reduced cases of Hacking					

12. Any other comments regarding the influence of mitigating fraud and cybercrime on financial profitability of commercial banks in Kenya?

_____

_____

_____

PART B: Effect of investing in security systems on financial profitability of commercial banks in Kenya

5. In your opinion, does investing in security systems influence financial profitability of commercial banks in Kenya?

[ ] Yes [ ] No

To what extent

[ ] To a very great extent [ ] To a great extent [ ] To a moderate extent

[ ] To a low extent [ ] To a very low extent

6. On a scale of 1 to 5, where 1=strongly disagree; 2=disagree; 3=neutral; 4=agree; and 5=strongly agree, kindly indicate your level of agreement with the following statements that are related to effect of investing in security systems on financial profitability of commercial banks in Kenya.

No.	Questions	1	2	3	4	5
1	The bank has invested in unique passcodes and encryptions					
2	The banks provide One time passwords (OTP)					
3	The bank has invested in advanced security protocols					
4	The bank has ensured that all their customers use registered devices for their transactions by ensuring they provide their mobile phone numbers before any transaction					

6. Any other comments regarding the effect of investing in security systems on financial profitability of commercial banks in Kenya?

_____

_____

_____

PART E: Influence of risk management practices on financial profitability of commercial banks in Kenya

13. In your opinion, do risk management practices influence financial profitability of commercial banks in Kenya?

[ ] Yes [ ] No

To what extent

[ ] To a very great extent [ ] To a great extent [ ] To a moderate extent

[ ] To a low extent [ ] To a very low extent

14. On a scale of 1 to 5, where 1=strongly disagree; 2=disagree; 3=neutral; 4=agree; and 5=strongly agree, kindly indicate your level of agreement with the following statements that are related to influence of risk management practices on financial profitability of commercial banks in Kenya.

No.	Questions	1	2	3	4	5
1	Competition from new business models					
2	Pressure from financial technology companies					
3	Changing customer expectations					
4	System back-ups to prevent loss of customer information					

15. Any other comments regarding the influence of risk management practices on financial profitability of commercial banks in Kenya?

_____

_____

_____

16. Please give suggestions/recommendations towards Effect of mobile banking investment on Financial Profitability of Commercial Banks in Kenya.

_____

_____

_____

THANK YOU FOR YOUR TIME AND COOPERATION!!

APPENDIX III: LIST OF TIER ONE COMMERCIAL BANKS

1. Barclays Bank
2. Standard Chartered Bank
3. Equity Bank
4. CFC Stanbic Bank
5. Kenya Commercial Bank
6. DTB Bank
7. Co-operative Bank

Source: CBK (2018)

APPENDIX IV: RAW DATA

No of Customers reg. Mobile banking

No of Customers reg. Mobile banking	2013	2014	2015	2016	2017
Kenya Commercial (KCB)	65794	75768.1	82120	99969	103579.9
Equity Bank Limited	57508	65968.9	73461	82250	96218.9
Co-op Bank	138863	157695	163692	184531	198857.8
Barclays Bank	52012	57284.5	61120	636812	67496.3
Standard Chartered Bank Ltd	17572	20630.1	25618	29093	34135.3
CFC Stanbic Bank	149499	168193	183086	191374	200774.7
Diamond Trust Bank Kenya	4055	5241.4	6290	7407	8302.1

Annual amount moved through mobile banking

Tier 1 Banks	2013 ('000)	2014 ('000)	2015 ('000)	2016 ('000)	2017 ('000)
Kenya Commercial (KCB)	4,457,989	18,815,320	43,407,208	78,445,474	134,552,330
Equity Bank Limited	16,360,520	19,299,421	46,799,126	251,660,310	321,278,399
Co-op Bank	34,710,872	44,652,812	51,106,465	61,246,172	91,392,016
Barclays Bank	12,726,333	16,649,320	27,553,052	35,622,003	39,709,365

Standard Chartered Bank Ltd	3,949,701	5,638,098	12,705,665	18,221,895	24,446,798
CFC Stanbic Bank	25,520,173	44,434,046	55,026,925	78,139,918	81,433,411
Diamond Trust Bank Kenya	226,708	465,690	895,582	971,821	1,125,622

Total Assets

Tier 1 Banks	**2013 ('000)**	**2014 ('000)**	**2015 ('000)**	**2016 ('000)**	**2017 ('000)**
Kenya Commercial Bank	390,852	490,338.	558,094	595,239	646,668
Equity Bank	277,729	344,572	428,062	473,713	524,465
Co-operative Bank of Kenya	231,215	285,396	342,518	351,856	386,857
Standard Chartered Bank	220,524	222,496	233,965	250,482	285,724
CFC Stanbic Bank	170,726	181,638	208,451	214,682	248,738

Barclays Bank of Kenya	206,739.	226,116	240,877	259,498	277,609
Diamond Trust Bank Kenya	114,136	141,175	190,947	244,123	277,081

Return on Assets

ROA	**2013**	**2014**	**2015**	**2016**	**2017**
Kenya Commercial (KCB)	5.91	06.379	7.27	5.64	9.27
Equity Bank Limited	7.99	8.501	9.07	6.00	13.07
Co-op Bank	7.94	8.544	9.66	5.15	12.66
Barclays Bank	5.01	5.479	6.14	4.02	6.74
Standard Chartered Bank Ltd	5.72	5.839	6.12	5.10	8.023
CFC Stanbic Bank	3.94	4.612	5.20	3.37	8.821
Diamond Trust Bank Kenya	5.28	5.646	6.29	3.64	7.823

Return on Equity

ROE	2013	2014	2015	2016	2017
Kenya Commercial (KCB)	28.4	31.0	29.0	35.2	22.6
Equity Bank Limited	36.0	49.4	47.2	43.5	42.7
Co-op Bank	30.0	29.5	28.5	22.7	21.7
Barclays Bank	36.8	32.3	30.4	24.8	15.9
Standard Chartered Bank Ltd	37.0	35.4	21.9	29.1	15.32
CFC Stanbic Bank	17.2	16.4	13.0	11.3	10.7
Diamond Trust Bank Kenya	30.0	24.5	23.5	24.4	20.9