

**EFFECT OF MOBILE BANKING SERVICES ON FINANCIAL
SECTOR DEVELOPMENT IN KENYA**

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DECLARATION

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

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This research project report has been submitted for examination with my authority as the as the university supervisor

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To all I say, May the Lord God richly bless you.

DEDICATION

This research project is dedicated to my family for their love and support.

ABSTRACT

Financial sector assumes a vital part in the financial improvement of any country. The depth of the financial sector has customarily advanced monetary development by expanding financial productivity, ventures and growth. Mobile banking is a service administered by monetary institutions in collaboration with mobile service administrators. The study sought to establish the effect of mobile banking services on financial sector development in Kenya. The study used a descriptive correlational research design. The target population for the study comprised of all 79 licensed commercial banks and micro-finance institutions in Kenya. The study used secondary data from audited financial reports of the banks and micro-finance institutions and financial performance data from CBK annual banking survey reports for the period 2006 to 2015. This comprised of quarterly values for all the study variables over the ten year period. Descriptive statistics and multivariate regression model was used to analyse data. The dependent variable was financial sector development while independent variables were ratio of mobile banking users to bank deposit account users, ratio of mobile banking transactions to total bank transactions, bank size and ratio of M2 to GDP. From the regression model, the study established that mobile banking variables influenced the development of the financial sector in Kenya. These are; ratio of mobile banking users to bank deposit account users, ratio of mobile banking transactions to total bank transactions, bank size and ratio of M2 to GDP. The study found out that the intercept was 16.101 for the all years. The four independent variables that were studied explain a substantial 89.7% of financial sector development in Kenya as represented by adjusted R^2 (0.897). This implied that mobile banking services positively and significantly affects the financial sector development in Kenya. The ratio of mobile banking users to bank deposit account users had the greatest effect on financial sector development in Kenya, followed by ratio of mobile banking transactions to total bank transactions, then bank size while ratio of M2 to GDP had the least effect on financial sector development in Kenya. The study concluded that mobile banking services positively and significantly affects the financial sector development in Kenya. The study recommends the inclusion of mobile banking by strategy developers in their formulation of policies because of the technological developments and the expected switch from physical branch networks to branchless banking models. The study further recommends that commercial banks utilize, modern technological innovations such as mobile banking, agency and internet based banking services in order to be competitive.

LIST OF ABBREVIATIONS AND ACRONYMS

ATM	Automated Teller Machine
CAR	Capital Adequacy Ratio
CBK	Central Bank of Kenya
EFT	Electronic Funds Transfer
EFTPOS	Electronic Funds Transfer at Point of Sale
ICT	Information Communication Technology
IDT	Innovation Diffusion Theory
IT	Information Technology
MFI s	Microfinance Institutions
PDA s	Personal Digital Assistants
SACCO	Savings Credit Cooperatives
SMS	Short Message Service
SPSS	Statistical Package for Social Science
SSA	Sub-Saharan Africa
TAM	Technology Acceptance Model
US	United States
USSD	Unstructured Supplementary Service Data

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CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Financial sector development is defined as the process of diversifying and strengthening the provision of financial services to meet the prerequisites of economic agents in a productive and successful manner and thus stimulate, as well as support, economic growth (SADC, 2006). Financial institutions have in recent years created cutting edge products and have advanced a broad variety of services with the aim of becoming more competitive.

Mobile banking is associated with the usage of banking facilities and resources utilizing computerized mobile gadgets like cell phones plus personal digital assistants (Porteous, 2006). Innovation has extraordinarily progressed playing a key part in enhancing the principles of service delivery in the financial sector. No longer do clients line up in the banking halls waiting to deposit cash, withdraw cash or even perform any other financial transaction (Anyango, Kathuo & Rotich, 2015). They can now do this whenever it might suit them by utilizing their Automated Teller Machine cards or on the web from the solace of their dwellings. This enormous development of cellular technology most monetary organisations wandered towards the undiscovered opportunities secured cooperation alongside cell phone administrators to deliver better financial services to their customers (Arora, Nyangosi & Sing, 2009).

This study was anchored on three noteworthy theories: financial intermediation theory, innovation diffusion theory (IDT) and contemporary banking theory. The hypothesis of

financial intermediation depends on the hypothesis of agency and instructive asymmetry. Innovation of Diffusion theory endeavours to clarify and depicts systems of how, why and what current innovations in this instance mobile and internet banking and is embraced and becomes effective (Clarke, 1995). Contemporary banking theory recommends that in any economy, financial institutions are key in the distribution of resources and capital. This hypothesis focuses on data asymmetry, a supposition that various financial specialists have diverse data bits on appropriate monetary components, and these specialists will apply this data to benefit themselves (Freixas & Rochet, 1988).

Financial sector development comprises majorly of commercial banks which are the fulcrum of a financial system and non-bank financial institutions. Mobile banking services have empowered assistance and rotation of cash from financial establishments to impoverished individuals from the general public in provincial and metropolitan areas at trade expenses substantially less costly than those provided by banks, which in the process has empowered banks to reach the unbanked bringing about enormous development in the banking sector (Jenkins, 2008). The entry and accessibility of the cell phones and its convenience in size and utility has conveyed extra value and created opportunities to both mobile phone service providers, clients, among others.

Levine (2005) proposes that financial markets and institutions can encourage economic growth through different channels by ensuring that the trading of merchandise and services is easy through the administration of payment services, pooling and mobilizing funds from an expansive number of investment stakeholders, acquiring and processing

information about conceivable investment projects and enterprises, in this way apportioning reserve funds to their most profitable use directly influencing the savings and investment decisions.

1.1.1 Mobile Banking

Tiwari, Buse and Herstatt (2006) describe mobile banking as the utilization of versatile access to computer intervened networks with the helped by telecommunications devices in initiating or completing any transaction resulting in the exchange of proprietary privileges to utilize merchandise and services. They additionally demonstrated that mobile banking pertains to administration of bank-affiliated monetary service guided by versatile communication tools. It is frequently executed through SMS or versatile web, yet can likewise be done by extraordinary applications customers downloaded to their cell phones or utilizing USSD codes (Al-Jabri, 2012). M-banking alludes to utilization of versatile media transmission to administer banking services. For instance, with the guide of cell phones alongside PDAs, customers can take out cash from their bank (Rashid & Saleem, 2011).

Darrat (1999) suggests that mobile banking provides a framework through which clients of financial institutions can perform diverse monetary exchanges through cell phones or PDA's. Porteous, (2006) categorized mobile banking into two. The administration of financial services with help of cell phones to reach unbanked population referred to as transformational m-banking. The other type of m-banking is additive, in which the cell phone essentially is an extra conduit utilized to enhance financial services to the existing account holders. Mobile banking has expanded the administration of broad variety of

monetary services targeting every customer segment (Vaidya, 2011). Mobile banking varies from mobile settlements that include utilization of portable gadgets to settle for products and utilities at the purchase spot or afar, similarly the utilization of prepaid and credit cards in carrying out Electronic transfer point of sale transactions (Darrat, 1999).

Mobile phones are used to perform numerous undertakings such as payment for merchandise and services, payment of electricity tokens, make cash withdrawals, deposits from agents, buy insurance, make charitable donations, payments for tickets and transfers to friends and relatives. As indicated by Central Bank of Kenya (CBK), transactions carried out through mobile phones rose to 24.7% to KSh2.4trn (\$26.4bn) in 2014, compared to KSh1.9trn (\$20.9bn) in 2013. Competition between mobile money offerings such as Safaricom Mpesa, Airtel Money, Mobikash, Orange, Tangaza Pesa and Equitel are diverse, ranging from loan products that allow users to save and borrow small amounts using their mobile phones to emergency payment instruments for electricity. Kenya saw mobile penetration at 83.9% as of June 2015. Growth drivers include rising use by merchants and individuals due to convenience, cost-effectiveness and security of utilizing a mobile phone to access, check and track financial accounts (CBK Report, 2015).

1.1.2 Financial Sector Development

Financial sector executes a vital part in economic improvement of any nation. The profundity of the financial sector has by and large been found to advance financial development by expanding monetary effectiveness, investment and development (Amanja, Ngugi & Maina, 2005). Financial intermediaries assume a critical part in an

economy by preparing, pooling and diverting household investment funds into profitable capital in this manner adding to financial development of a nation. An aggressive and all around financial sector is a vital component to financial development. In an efficient financial market, interest rates on savings are higher while loan rates are lower, so that the change of family reserve funds into gainful capital venture is faster (Humprey, Fernandez & Valverde, 2003).

The depth, size to cover access proficiency and solidness of financial systems across and within nations mirrors the yield of a financial system in terms the size of reserve funds and investments. Efficient allocation of credit is the fundamental component of a sound financial sector. The stability and strength of a financial system is important and can be considered as a balance between risks and returns. These mirror the distinctions in bank resource leverage and hazards, as they reflect operational, credit and exchangeability risks encountered by banks (AERC, 2011).

Financial sector development highly influences economic growth. The financial sector is defined as the mechanism through which resources are transferred among economic agents; spending less than economic growth refers to the multiplication of merchandise and services delivered in an economy. Among the most grounded components of the modern economists' principles is that financial sector development significantly affects economic growth. As per Ndebbio (2004), financial development is not realizable bereft the joined part of financial deepening, wages, plus investment. He contends that various business analysts have assessed on numerous dimensions and assorted levels of

accentuation the part of finance plus money in economic advancement. Ndebbio (2004) citing Goldsmith (1969) and Gurley and Shaw (1967) emphasizes on importance of financial intermediation through financial institutions in the process of savings and investments where money, barely or extensively, is part of the broad range of economic resources of the wealth holder's set. Surely, the development and advancement of any nation's economy immensely relies on the part of financial deepening.

1.1.3 Linkage of Mobile Banking and Financial Sector Development

The inception of mobile banking services relies upon the favourable integration or alliance of two integrally peculiar innovative platforms; banking and mobile telephone. Financial institutions are now partnering with mobile and utility administrative suppliers with the purpose of administering Mobile banking services (Buse and Tiwari, 2007). Mobile banking has exhibited the guarantee to leverage mobile technology to widen financial services to huge sections of unbanked poor people fundamentally because it is rapidly turning into a pervasively deployed technology, even among the poor in the society.

Mobile phones have emerged as the most essential form of communication in both the developed and underdeveloped nations (Bhavnani, Chiu, Janakiram & Silarsky, 2008). The European nations of the north are exceptional in the take up of diverse mobile cutting edge technologies. M-banking services such as balance enquiry, money exchanges, bill payments, shares transactions, portfolio administration, premium payments were initiated in 2003 in Finland. The advancement in delivery of goods and services significantly contributes to investment, local GDP and growth in reserves (Mari, Rafael and Francisco,

2007). Hendrickson and Nichols (2011) resounded or echoed these opinions while considering the execution of little banks in the US in relation to interstate branching. They established that small banks performed better when they use new technology across their branches.

The financial segment in Kenya is comparably well developed and sound with the fundamental features of a well-functional monetary system having been set up, including the formation of the primary credit-reference authority in 2010. Rapid growth in credit has been witnessed in present years yet the financial sector has still failed to achieve its maximum capacity in supporting the assignment of monetary assets over the economy (CBK Report, 2015). By June 30, 2015 there were 43 commercial banks, 35 microfinance banks, one mortgage finance company, 86 forex bureaus, 8 foreign banks representatives, 3 credit reference bureaus and 14 money settlement providers regulated by the Central Bank of Kenya (Cyttonn, 2016).

The financial sectors performance in Kenya has been generally sound in the previous years despite the global financial crisis. This is attributed to some extent part, to the strong supervision by the Central Bank in implementing and enforcing its supervisory activities to identify any immediate problems in the financial system. The CBK sets prudential regulations including minimum liquidity and cash reserve ratios. The Capital Markets Authority (CMA) has additional responsibilities of supervising the financial institutions listed on the Nairobi securities exchange market. Most of the financial institutions have put in place introduced strict credit appraisal, monitoring and recovery

procedures for new and existing credit facilities, foreign currency loans have been scaled down, value caps have been introduced and relations with foreign banks have been revised in order to reduce vulnerability to exchange rate shocks (CBK, 2013).

According to figures published by CBK, the banking sector is growing and profitable, although expenses are climbing faster. EPS grew by 13.6% on the back of an improved macroeconomic environment, but of note was that loan growth outpaced deposit growth. Assets, deposits, profitability and products offerings experienced massive growth in first quarter of 2016. This was due to efficiency and convenience, leveraging on diversification to the utilization of alternative forms, like internet, versatile and agency banking supported by favorable macroeconomic environment. The listed banking sector's gross overall assets rose to 10.5% to Kes. 2.8 trillion in March 2016, from Kes 2.5 trillion in March 2015. Total loans and advances rose to 14.6% to Kes. 1.7 trillion in March 2016 from Kes. 1.5 trillion in March 2015 while deposits rose to 11.5% to Kes. 2.0 trillion in March 2016 from 1.8 trillion in March 2015. (Cytonn, 2016). The sector is ahead of minimum reserve requirements. The sector's overall balance sheet grew by 21.4% to Kes. 3.6 trn (\$39.6bn) in June 2015, up from Kes 3 trn (\$33bn) a year earlier (Cytonn, 2016).

Kenya is a global pioneer in mobile banking services. The historical point M-Pesa service, offered through collaboration of Vodafone and Safaricom, permits a variety of cash exchange services and various financial transactions to be done through cell phones. Mobile phones are rapidly becoming gadgets for personal, business financial management and expenditure control which helps individual consumers to make diverse, timely and informed financial decisions (Federal Reserve, 2016).

Kenya is highly over-banked, highly competitive, swift and modern with a generally high proportion of financial institutions compared to the aggregate population. This has led to consolidation, and heightened mergers and acquisition activities. Tanzanian Bank, Bank M, recently acquired 51% of Oriental Commercial Bank, GT Bank acquiring Fina Bank, Mwalimu Holdings acquiring Equatorial and I&M Bank acquiring Giro Bank over the last 2 years (Cytonn, 2016).

The Kenya Post Office Savings Bank and Micro Finance Institutions (MFIs) have been on the forefront in offering credit and cash management services to those sections that are underserved by business banks. The sector has experienced tremendous growth and is anticipated to enhance financial deepening and improve availability of financial products and services, specifically in targeting the unbanked. Regulation, licensing and supervision of MFIs is done through the MFI Act of 2008. MFIs offer retail lending widely and many would like to transform into banks, a trajectory that has been eked out previously by locally owned Equity Bank and Family Bank, which are now full-scale commercial institutions. As the number of registered MFIs and bank continues to grow, they are looking for new revenue streams outside their traditional services. Various platforms like the iNuka Pap propriety platform provide instant emergency financial services to Micro Finance Institutions (MFI) and SACCO members one thus taking convenience to a new level and assure to address customer's small cash emergencies anywhere and anytime (CBK report, 2015).

The financial sector has vital influence in enhancing economic advancement of a county. Banks will continue to favour technology-fuelled growth, as the lowest cost mechanism

for service delivery. The UNCTAD (2015) conference concluded that for financial inclusion to succeed there is need for countries to encourage innovation, in mobile banking, micro banking and agent banking by integrating payments and widening the banking platform through collaboration of the financial and mobile services. Economic growth can be enhanced through accumulation of capital and technological progression by boosting rate of savings, delivering quality investment information, optimum allocation of capital resources, mobilization and pooling of funds, facilitating the transfer of more merchandise and services, empowering and stimulating foreign capital inflows (CBK report, 2015).

1.1 Research Problem

The timely convenience, simplicity, safety and quickness in operation that have been brought into play by the inception of comprehensive m-banking ideology has enhanced the need for commercial banks and micro finance institutions in Kenya to shift from their classical or common ways of carrying business to incorporate the mobile transactions in their business (Mbiti, 2011). Mobile phones users can enquire balances, obtain prepaid recharges, mobile loans, virtual, settle bills, utilities, salaries, pay merchants, and send contributions, gifts as well as donations anywhere at any time. Mobile cash transmission services can be utilised to increase proficiency and trade development through low cost, reliable and efficient money service support networks that diminish the risks and needs for cash transactions (Alala, Muisyo and Musiega, 2014). The mobile banking technology innovation is considered easy to use as well as effective and trustworthy with vast capabilities to spread monetary services to the unbanked or those inclining toward less expensive financial packages (Mbogo, 2010).

The needs for transactional and payment services are rarely well catered for by ordinary banks due to the fact that it is uphill task to obtain, maintain a cost effective and simple to use financially savvy bundle or application (Higgins, Kendall & Lyon, 2012). There is a thriving demand to conceptualize probable functionalities that will remodel and revolutionise the financial sector. In regard banks and other financial institutions are tactfully embarking upon or initiating fresh advanced mobile banking platforms in a bid to capture financial sectors vast array of needs as well as solve issues related to scarce, unaffordable and available budgetary administrations to bolster and streamline business processes and workings leveraging efficiencies of using mobile banking (Porteous, 2009).

From literature and empirical evidence review similar studies have been done. Daniel (1999) postulated that a large proportion of the explorations in M-banking had concentrated on administration of banking services using channels or gadgets through web based banking. Most studies have focused on commerce with special focus on the difficulties confronted by banks clients and the advantages the banks and clients accrue (Mbuvi, 2007). Munaye (2009) assessed mobile banking as a vital reaction reflex. However, he did not consider its effects on financial performance. Kigen (2010) concentrated on the impact of mobile banking on exchange expenses in microfinance institutions. Wanja (2014) reviewed the impact of web and mobile banking on financial performance of business banks in Kenya. The relationship was strongly positive. However her study did not touch on other financial institutions. Kithaka (2014) presumed versatile banking services had a positive impact on the financial performance of banking institutions. He further recommends a case by case study on how mobile money services

have affected traditional streams of income and assets in the banking and financial institutions at large to be done. Findings from various studies have given mixed results arising from different units of analysis, measures of growth, reliance on cross sectional methods thus the existing body of knowledge is not sufficient enough to clearly determine the effect of mobile banking on the entire financial sector development in Kenya. This study sought to answer the following research question: What is the effect of mobile banking services on financial sector development in Kenya?

1.3 Research Objective

To determine the effect of mobile banking services on financial sector development in Kenya.

1.4 Value of the Study

For regulators and policy makers like the Central Bank of Kenya and Capital Markets Authority, the findings of this study are critical in illuminating the approach to policy formulation particularly with respect to regulation, safety issues and constraints facing mobile banking services in Kenya. The research findings will increase dimensions which will influence direction policies will take with respect to adoption and usage of mobile banking and also components that spur monetary development.

The study will make contributions to growth in knowledge and scholarly understanding on the effects of mobile innovations on the performance of banks and micro finance establishments and advise on area for advance research in the ever evolving and rapidly changing mobile technology. The findings can be used as a basis for abstract and empirical research.

The study will help the management in commercial banks and MFIs by informing them about the perceived impacts of mobile banking on the performance of their organizations plus financial sector at large and need to utilize digital delivery means to bank products and service. Findings of this study will assist managements to envisage, plan and develop strategies of how to reap utmost rewards from mobile banking service usage. The general public will benefit by gaining further their insights in the area of mobile banking adoption and increasing potential it offers to the financial sector.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter concentrates on the review of major theories, conceptual, empirical literature alongside conceptualization of the study. First, the chapter presents literature on theoretical underpinnings of the study followed by conceptual and empirical writing on mobile banking and financial sector development. The chapter closes with a summary plus knowledge gap for this study.

2.2 Theoretical Review

Three theories which are reviewed in this section include the financial intermediation theory, innovation diffusion theory (IDT) and contemporary banking theory. These hypotheses guided the study.

2.2.1 Financial Intermediation Theory

Financial intermediation refers to the procedure used by excess units to store savings with money related establishments who subsequently loan to inadequate units. Bisignano (2012) distinguished financial mediators into four categories: Fixed sum obligations or deposits not identified with the execution of a portfolio. Short-term deposits with much shorter maturity period than their resources. Chequeable liabilities which can be withdrawn on request. These form the largest percentages and lastly, liabilities and resources are to a great extent not transferable. The most vital commitment of middle people is an unflinching stream of assets from surplus to shortfall units.

The budgetary intermediation hypothesis illuminates the part of money related mediators in the economy; vast studies observed underline their part in accomplishing a solid monetary and fiscal advancement, and the effect of moderation of cash related mediation, focusing on part of the Central Bank in the control, supervision of financial centered individuals. This hypothesis aided with separating the exchange mannerisms of business banks, and impacts on cash related execution (Scholtens & Van Wensveen, 2013).

2.2.2 Diffusion Innovation Theory

Mahajan and Peterson (1985) characterized any object, practice or thought that is perceived new by individuals from the social framework can be termed up as an innovation. They characterized the dispersion of innovation as the procedure through which the advancement is imparted by specific channels overtime among individuals from social frameworks. Dispersion of innovation hypothesis endeavors to clarify and portray the systems of how fresh a development for this situation web and versatile managing an account is grasped and gets to be productive (Clarke, 1995). Sevcik (2004) expressed concern that not all innovations were embraced regardless of the likelihood that they were incredible it would take a while for the developments to be endorsed. They additionally highlighted that imperviousness to transitions might be an obstacle to dissemination of advancements regardless of the fact that it would not block the development but would slow it down.

The selection and use of versatile banking can possibly develop the constrained nature and purview of the financial segment to needy individuals. Majority of the present written

work is from formative/professionals field with couple of academic studies currently developing (Mas & Morawczynski, 2009). Albeit, greater parts of these studies have not been assessed by experts, they give vital data on genuine utilization and significant data on the progression and application of mobile banking. Ivatury and Pickens (2006) gave beneficial understanding about the characteristics of the first users of WIZZIT, the premier primary huge exercises focused on offering versatile cash to the impoverished in South Africa. The interpretive works of Morawczynski amid his year and a half sojourn in Kenya are also fundamental (Morawczynski & Krepp, 2011). By administering conventional innovation acknowledgment frameworks and structures to the reception of transformative versatile banking services, this research plans to convey the analysis to the standard data frameworks writing with the hypothesis been utilized in analyzing impacts of diverse mobile banking items and products on fiscal execution in business banks.

2.2.3 Contemporary Banking Theory

Bhattacharya and Thakor (1993) recommend that banks, in collaboration with financial mediators are key in apportioning of capital in the economy. The hypothesis is focused on asymmetric data, a supposition that diverse financial specialists have distinctive bits of data on significant financial factors, in that specialists will utilize this data to their personal specific advantage (Freixas & Rochet, 1988). Adverse selection and moral hazard issues arise as a result of incomplete information. Problems arising before the exchange happens and are identified with the absence of data about the lender specific attributes are known as adverse selection. Moral risk happens after the exchange happens and is associated with motivators causing lenders to act selfishly or opportunistic.

2.3 Determinants of Financial Sector Development

From a hypothetical point of view, the most probable fundamentals of financial sector advancement can be recorded as trade openness, financial liberalization, economic growth, inflation, savings. Some factors are expected to have a positive effect while others are required to negatively affect monetary segment improvement. For example, financial liberalization, trade openness, economic growth and savings are hypothetically anticipated to positively affect financial sector development while inflation will negatively or, at times, positively affect financial sector advancement (Khan, 2002).

2.3.1 Economic Growth

Greenwood and Boyan (2000) clarify as the economy develops, expenses of money related intermediation fall on account of expanded rivalry, bringing about an increase and expansion in assets accessible for profitable speculations. Various studies also clarify the hypothetical connection amidst financial sector development and monetary development. For example, the significance of salary stratum in financial sector advancement has likewise been tended to (Levine, 2005). The author stresses on the need for improvement of financial sector to be set up in order to spur monetary growth. This is on the grounds that; development prompts to advance improvement of the monetary framework and gives inspiration to extend and to augment the framework for financial intermediation.

Amid times of monetary extension, the monetary segment is more developed; indicating financing requirements for extra advancement as response to genuine movement (Gurley & Shaw, 2007). That is, a direct result of expanded interest for money related administrations with expanded per capita pay, development of the financial framework is empowered.

The cost of money related services includes a significant fixed segment along which these lines with an expansion on the volume of exchanges will result in a fall of normal expenses. In that capacity, well-off economies have more interest for budgetary administrations and prepared to bear the cost of an expensive financial framework. This suggests financial advancement is critically influenced by the level of certified economic exercises (Ang, 2007). One vital hypothesis that clarifies the effect of monetary development on money related advancement is the request-driven speculation, as per which the development of an economy will produce new interests for budgetary administrations. Such increment sought after consequently, will bring about further modern financial intermediaries skilled to take care of the new interests for their products (Yartey, 2008).

2.3.2 Trade Openness

Presently various studies have examined that financial development and exchange might be related. Huang and Temple (2005) utilized the time series and cross country methods to examine the correlation amongst trade and finance. Their discoveries propose that development in products advertise openness and is trailed by consistent development in monetary improvement.

Various different reviews have upheld the proposal that arrangements that elevate openness to outside exchanges have a tendency to enhance financial development. Huang and Temple (2005) utilized cross-country and time-arrangement varieties techniques in exchange openness and monetary improvement, and they found constructive outcome of

stock market openness on money related sector improvement. Hypothetically, trade openness is required to affect money related advancement in light of the fact that a bring up in the volume of trade exchange builds open doors for extension of financial deepening and economic growth. Both these components will undoubtedly activate residential funds and raise inflows, expanding fluid liabilities for advancement of development of financial framework. Hence, capital inflows are additionally anticipated that would affect money related advancement since more capital inflows are relied upon to expand fluid liabilities and bolster encourage budgetary improvement (Taghipour, 2009).

From another hypothetical point of view, exchange openness supports financial activities and capital inflows. The previous channel increases the pool of assets in the monetary framework to back credit development. Additionally, credit augmentation is a delayed consequence of investment inflow, which increases accessible assets in the monetary structure (Taghipour, 2009).

2.3.3 Financial Liberalization

As indicated by the financial liberalization hypothesis, decontrolling domestic monetary market and permitting it to characterize the cost of loans while controlling credit will help in macroeconomic security and financial development of nations. Financial liberalization could be helpful in the event that it brings about greater investment funds, lessening the cost of capital and positive reception of enhanced administrative traditions. Premier speculations of McKinnon (1973) and Shaw (1973) hypothesized that liberalization would connected with higher genuine financing costs and in this way spur reserve funds

and the greater savings ratio would lead to bigger economic ventures prompting to higher financial development. In general, monetary related progression is relied upon to add to the effectiveness by which markets convert reserve funds into productive investment and growth. Henceforth, as per this view habitual higher financial development, venture and saving rates, and additionally money related improvement taking after budgetary advancement will be witnessed.

Then again, McKinnon (1973) and Shaw (1973) demonstrate that monetary suppression approaches will negatively affect a nation's economy. For instance, loan cost caps or limits may result in an expansion in the spread amongst deposits and rates of interest. For instance, situations where the government controls financing costs on operations of banks, subsequently, they are not able to contend on the available savings and advances. Besides, the direction of budgetary markets, this infers limits on rates of interest, great saving proportions and credit projects, prompts lower reserves, brings down ventures and negatively affect financial development and monetary growth.

McKinnon and Shaw (2003) presentation on financial progression hypothesis was followed by an exceptionally broad push to change financial related frameworks emerged. This stir began in the mid-1980s, where numerous creating nations have incorporated broad changes of their fiscal frameworks by changing and forging them towards market set. As opposed to restraint in financing, money related progression can be accomplished in cases of no or limited government mediation in a free market with adequate reserves to support investments. Banks are included in credit assigning among

loanees, and the standards and amount of ventures will increase funds accessibility as the cost of assets drops. The hypothesis suggests that government constraints on the functioning of fiscal networks, hold decisions, liquidity necessities and coordinated credit programs, can negatively influence the amount and nature of investments and thusly impede money related improvement (Ang, 2007).

Moreover, as per McKinnon-Shaw structure, controls on rates of interest and especially financing cost limits, can disrupt the economy from various perspectives. It can debilitate financial specialists from putting resources into high-hazard, yet possibly high yielding ventures. Financial intermediaries may turn out to be risk averse or unwilling and may advance special loaning rates to existing loanees. Borrowers may decide to contribute in high principal requirement ventures, while acquiring assets at generally minimal effort (Ang, 2007). Generally, it can be summed up that financial liberation is hypothetically anticipated that would prompt to financial development.

In any case, it ought to likewise be specified that not all hypothesis augment this contention. Ang (2007) argues that, changing loan fees cannot consequently prompt to great improvement of the financial sector. Ideally, deposit indemnity coverage, nonappearance of financing cost ceilings may bring about excessively unsafe lending conduct among banks because of moral hazard (McKinnon & Pill, 2007).

2.3.4 Savings

Mobilizing savings for investment projects is a primary role of financial intermediaries. Consequently, it is anticipated that investments and reserve funds to be noteworthy

causes of financial sector development (Yartey, 2008). This is on account of venture openings; the extent of the financial framework grows. Expanded number of ventures organizes assets in the banking frameworks, prompting an extension in private credit development. As such, more investment builds interest for credit, expanding financial intermediation. In this way, reserve funds and investments are relied upon to bring about money financial development. Huang (2005) exactly investigates the course and presence of causality amidst money related advancement and private speculations between 1970-1998 using information set of 43 third world nations. Results showed positive causality impacts in all bearings.

2.3.5 Inflation

Various vital macroeconomic strategies which have been recorded to be useful to financial progression one being keeping up lower levels of inflation. Ben Naceur et al (2007) and Boyd et al (2001) analytically and Huybens and Smith (1999), hypothetically, review the impacts of swelling on money related area advancement. They concluded that greater the level of inflation, the smaller, less dynamic, and low proficient value banks and markets in an economy.

Moreover, rapid expansion increases in prices; advances capital outflows and debilitates choices for solitary activities leading to decline for the need of credit. Additionally, the provision of credit might adversely be influenced as an aftereffect of a contracting pool of savings since agents differentiate far from fluid resources for avoid the danger of the inflationary tax. Along these lines, hypothetically, it is expected that expansion represses budgetary division improvement (Naceur et al., 2007). Khan (2002) postulates that low levels of inflation may encourage financial sector development instead of upsetting it.

The rate of inflation in countries like Iran is low suggesting that it should positively affect financial sector development.

Various theories have been highlighted in this section, it is anticipated that capital inflows, economic growth, financial liberalization, exchange openness and savings positively affect financial sector development while Inflation has a negatively affect financial sector development. Whatever remains of this theory depends on this hypothetical establishment. Speculatively, it is likewise expected that monetary constraint negatively affects money related division advancement.

2.4 Empirical Review

Various studies demonstrate that mobile banking has considerable constructive outcomes on bank profitability, savings, money exchange, service delivery, customer service, and bank patronage and positively affect the growth of the banking. Agboola (2006) examined the impact of ICT in banking functionalities in Nigeria using the level and natural selection of creative innovations; balanced usage of the recognized ICT advancements; and the effect of appropriation of ICT gadgets on banks. He observed that innovation was a fundamental catalyst of contention in the financial world. He witnessed an increase in the appropriation of automated teller machines, electronic funds transfer, smart cards, electronic home, office and cell phone banking. He reasoned that utilization of Information communication technology upgrades the banks brand and prompts to a broader, speedier and more beneficial market. He advised banks to invest in Information communication technology products to encourage speed, solace, and precision, or generally miss out to their rivals.

Tiwari, Buse and Herstatt (2006) concentrated on mobile banking as enterprise technique, effect of versatile inventions on client conduct and suggestions for financial institutions. The study tried to analyse the open doors for banks to produce incomes by exhibiting value included; innovative versatile money related services holding and notwithstanding extending their base of technology to cognizance clients. Shirley and Sushanta (2006) concentrated on the impact of data innovation on the banking field. They researched both speculatively, hypothetically and precisely how spending on information, research and advancement could impact bank gains by method for contention in budgetary administrations provided by the banks. Utilising a leading group of 68 US banks, duration of above 20 years to evaluate the effect of Information technology on productivity of banks, they observed that Information technology could provoke cost savings, higher IT outlays can mastermind impacts bringing down bank profits.

Donner and Tellez (2008) surveyed the relationship amidst versatile banking and economic development. They reviewed the correlation between selection, effect, and usage. Findings from the study indicate by advancing an approach to bring down expenses of transferring cash from different locations and offering an approach to carry clients in touch with formal monetary frameworks, m-managing account/m-instalments structures turn out to be an imperative advancement for the third world countries. Notwithstanding, the genuine measure of significance needed numerous reviews utilizing different procedures and various hypothetical points of view before noting the inquiries regarding appropriation and effect.

Malhotra and Singh (2009) reviewed the impact of web based banking on bank achievements and hazards. They discovered that large web banks are bigger, beneficial and have efficient operations. They likewise discovered that web banks have higher resource quality and can bring down building and equipment expenses. Indian internet banks depend considerably on savings. Smaller banks which use internet banking had experienced a decrease in profitability.

Chinget, Chuan, Sim, Kam and Tan (2011) contemplated the elements influencing mobile banking reception from the purpose of an experimental examination in Malaysian. The study reviewed the expansion of technology acceptance frameworks to research on mobile banking reception in Malaysia. Particularly of great interest study was the covariance amidst perceived convenience, usability, social standards, dangers, imaginativeness, and relative points of interest with regard to attitudes in embracing mobile banking. The discoveries from this study uncovered that apparent helpfulness, usability, relative favourable circumstances, saw dangers and individual ingenuity were the elements influencing the behavioural aims of mobile clients to embrace versatile banking services in Malaysia. The social standard was the main variable observed to be irrelevant in this study.

Tchouassi (2012) sought establish if mobile phones truly work to spread out financial services to the underserved utilizing experimental lessons from chosen African nations. The study attempted to survey how cell phones could be utilized to stretch out, manage

account administrations to the underserved impoverished fragment of the populace. The study noticed that helpless little-wage families in African nations frequently needed access to accounts and confronted colossal expenses of directing fundamental financial exchanges. The mobile phone introduced an extraordinary open door to enable arrangement of money related administrations for the unbanked. Notwithstanding mechanical and financial advancement, strategy and administrative development was expected to make these services a reality.

Al-Jabri (2012) examined mobile banking selection in Saudi Arabia by exploiting the dispersion of innovation hypothesis. The study assessed an arrangement of specialized qualities and their impact on reception of versatile banking in third world nations, like Saudi Arabia. Dispersion of advancement was utilized to gauge the speculations and examine components that might affect mobile banking reception and utilization. The analysis suggested that financial institutions, in Saudi Arabia, should avail mobile good banking services which capture diverse customer's prerequisites, convictions, prior experiences and habits while fulfilling customer wishes. The study appreciated and separated the effect of versatile trades volumes on budgetary execution of commercial banks.

Zift (2006) conveyed a study which demonstrated numerous clients of mobile phones had no knowledge of the availability or provision of m-banking services by micro finance institutions. The complexity of web banking was the other reason why customers were hesitant to exploit or manage account administrations.

Wambari (2009) analysed portable management of accounts in developing nations using an occasion of Kenya. This study tried setting up the significance of versatile banking in the everyday activities of private companies and to comprehend the difficulties required in utilizing m-managing like a business apparatus, points of interest and detriments there in. The study explained how appropriation and utilization of mobile phones is a result of a universal procedure, installed in common habits, for example, small medium scale practises which prompts to financial advantages.

Munaye (2009) contemplated the utilization of portable savings as a key reaction of Equity bank constrained to the tests in the outside business conditions. He additionally evaluated the idea of versatile banking as a vital reaction however its consequences on monetary realizations were not highlighted.

Kigen (2010) contemplated the effect of versatile banking on exchange expenses of MFI establishments. He discovered that at that time versatile savings had diminished exchange expenses significantly however not specifically observed by banks due to the little client numbers. He sought to explore the effect that portable savings had on value-based expenses of MFI establishments.

King'oo (2011) contemplated the relationship between electronic saving money and monetary execution of business banks in Kenya. He gave careful consideration to the MFIs in Nairobi. He really took a gander at the more extensive electronic banking. As per Koivu (2012) take-up of cell phones has been extraordinary in Kenya. It has influenced the execution of affiliations, direct and essential administration of the entire economy.

The pattern proceeds with dependence on portable gadgets to perform money related exchange is relentlessly picking up energy. Mobile banking is an advancement which has dynamically rendered itself unavoidable method for penetrating into various areas of the economy and industry.

Rachel (2013) analysed the impact of versatile savings upon the monetary performance of business banks in Kenya. Illustrative or descriptive research outline was used. The sample size constituted of 43 business banks working in Kenya as at December 2012 and 6 mobile utility administrators and. The aggregate sums exchanged through the mobile phone for as far back as 5 years were gathered and the quantity of clients was relapsed against banks performance as assessed by Investment returns. The research established that there exists a feeble positive correlation amongst mobile savings and the monetary execution of business banks in Kenya.

Kithaka (2014) considered how versatile banking affected budgetary performance of Kenyan business banks. Cross sectional survey research outline was utilized for this situation. This informed who, how and what about the mobile banking in commercial banks in Kenya and as a one-time occasion. The study embraced a census survey where all the commercial banks practicing mobile banking in Kenya were studied. The study made use of secondary data. The study inferred that mobile banking positively and significantly influences the fiscal performance of business banks in Kenya.

Anyango, Kathuo and Rotich (2015) studied the impact of mobile banking on the financial achievements of Kenyan business banks. Descriptive research outline was utilised in the study. The sample size constituted of 42 existing Kenyan business banks as at December 2014. Questionnaires were utilized in gathering primary data. The examination of quantifiable information was restricted to clear measurements and subjective information was displayed through descriptions. From the study the volume of mobile exchanges had colossally expanded in most recent 5 years after the initiation of m-banking. They deduced that banks which grasped m-money administrations had an inconceivable level extended customer outreach, and along these lines had altogether upgraded their financial performance.

2.5 Summary of Literature Review

The main issues reviewed in this chapter include the effects of mobile banking on overall development of the financial sector which include market extension, increased partnership, service delivery efficiency, customer satisfaction and access to information. From the theoretical and empirical reviews, most of the studies have focused on the wider electronic banking as opposed to specifically mobile banking while the ones on mobile banking have very restricted research on effect of mobile banking services on the financial sector development in Kenya. A great proportion of the existing studies have been conducted in other countries with diverse macro-economic environments compared to Kenya. This study consequently sought to fill in the existing research gap.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This section focuses on how the study was done in so as to achieve the intended objective. It details the research design and methodology utilized to carry out research. This chapter also discusses sample size used, data gathering tools and analysis techniques.

3.2 Research Design

The study utilized descriptive correlational research outline. This was considered appropriate since the study involved an in-depth study of the effect of mobile banking services on financial sector development. A descriptive study was done to establish and explain the attributes of the variables being studied. Descriptive research outline was utilised to gather data pertaining to the current situation, describe what existed in respect to the study variables or conditions in a particular occasions. It helps in recognizing study factors and hypothetical constructs which are useful in experiment hypotheses. The technique involves collecting data that describes specific events, orchestrates, organizes, delineates and clarifies the information. During data analysis patterns appear which are categorized for interpretation.

3.3 Population of the Study

Target population is a complete set of elements to which a researcher wants to collect data from in order to make conclusions (Mugenda & Mugenda, 2003). The population of interest for the study comprised of 79 licensed business banks and MFIs in Kenya. As at December 2015, there were 44 licensed commercial banks and 35 MFIs. This study thus

constituted a census of the financial reports of 44 licensed commercial banks and 35 MFIs in the period 2006 to 2015 (see appendix 1).

3.4 Data Collection

The study utilised secondary data of the certified financial extracts of banks and micro-finance institutions and financial performance data from CBK annual banking survey reports. It also included the banks publications, journals and periodicals. The quarterly values for all variables for a period of ten years (2006 - 2015) were gathered from these sources.

3.5 Data Analysis

The data gathered was cleaned, coded and efficiently sorted out in a way that enabled analysis utilizing the Statistical Package for Social Sciences (SPSS). Quantitative examination was performed utilizing descriptive statistics like standard deviation, mean scores and coefficient of variation. This enabled the researcher to make inferences about the findings.

3.5.1 Analytical Model

A regression model was used to determine the effect of mobile banking services on financial sector development in Kenya. The researcher used the proportions of private credit to GDP to measure of financial sector development. Operating expenses, other bank particular components form part of the independent variables. The regression equation is illustrated as below:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon$$

Where:

Y = Financial sector development (assessed by ratio of private credit to GDP)

β_0 = constant: It defines the degree of financial sector development without inclusion of predictor variables.

$\beta_1 - \beta_5$ = regression coefficients.

X_1 = Ratio of registered mobile banking customers to the total number of account holders during the period.

X_2 = Ratio of total mobile banking transactions to total bank transactions

X_3 = Bank size measured by natural logarithm of aggregate assets

X_4 = Ratio of M2 to GDP to represent the macro economic factors affecting financial sector development in Kenya.

ε = represents the error term i.e. all the factors that affect financial sector development not included in the model either because they are difficult to measure or are unknown.

Table 3.1 Operationalization of Research Variables

Variable		Measurement
1	Financial sector development	Ratio of private credit to GDP
2	Annual amount of money moved through mobile banking	Measured by amount of deposits and transfers during the period in review
3	Number of users of mobile banking services	Measured by the number of customers using mobile banking services in period under review
4	Bank size	Measured by natural logarithm of aggregate assets
5	Ratio of M2 to GDP	Ratio of money supply to GDP

3.5.2 Test of Significance

The study utilized F-test to determine joint significance of all coefficients. The significance of the dependent and independent variables in the regression model was measured utilising the p value; whereby, if the p estimation of the variable is 0.05 (5%) and beneath, then the variable was viewed as significant. Where the p estimation of the variable is above 0.05, then the relationship of the factors was deemed to be insignificant. Beta demonstrated the extent of the relationship between dependent and independent variables; high, low, positive or negative; this was uncovered by the estimation of the beta co-efficient.

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

The objective of this study was to determine the effect of mobile banking services on financial sector development in Kenya. Data from certified financial extracts of commercial banks and micro-finance institutions, financial performance data from CBK annual banking survey reports was utilized in the study. Data was collected from all the targeted 79 financial institutions in Kenya. This chapter discusses the data analysis, findings, interpretations and presentation. It starts with descriptive statistics, followed by regression analysis of the study variables.

4.2 Characteristics of Study Variables

4.2.1 Summary of Variables for the Study Period

Table 4.1 below gives a summary of the values of study variables for the period 2006 to 2015.

Table 4.1: Summary of Variables for the Study Period

Variable	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Ratio of mobile banking users to bank deposit account users	0.58	0.64	0.72	0.79	0.81	0.88	1.16	1.32	1.34	1.44
Ratio of total mobile banking transactions to total bank transactions	0.031	0.034	0.036	0.039	0.041	0.042	0.058	0.063	0.071	0.086
Bank size	27.14	29.4	28.5	30.1	28.18	28.33	28.48	28.63	28.81	29.12
Ratio of M2 to GDP	39.87	40.25	44.6	39.3	42.8	40.93	40.95	41.5	42.93	42.2

Source: Research data (2016)

As indicated by the findings in table 4.1 the ratio of registered mobile banking customers to the total number of account holders during the period has been on an increasing trend since the year 2006. The year 2015 had the highest ratio at 1.44. The ratio of total mobile banking transactions to total bank transactions too has been on an upward trend since 2006 with the highest ratio (0.086) experienced in 2015. The same trend is maintained by bank size where the highest value of 29.12 was recorded in 2015. However, the ratio of M2 to GDP posted mixed results during the period of study with the peak being 2014 with a value of 42.93.

4.2.1 Descriptive Statistics

From the values above the mean and standard deviation was computed for each variable for the entire study period. The results are tabulated below:

Table 4.2 Descriptive Statistics

	Mean	Standard Deviation	Variance
Ratio of mobile banking users to bank deposit account users	0.97	0.30	0.09
Ratio of mobile banking transactions to total bank transactions	0.05	0.02	0.0004
Bank Size	28.67	0.75	0.5625
Ratio of M2 to GDP	41.53	1.53	2.3409

Source: Research data (2016)

Table 4.2 shows that the mean ratio of mobile banking users to bank deposit account users during the period of study was 0.97 with standard deviation of 0.3. The mean ratio of mobile banking transactions to total bank transactions was 0.05 with standard

deviation of 0.02 while mean ratio of bank size was 28.67 with standard deviation of 0.75. The mean ratio of M2 to GDP was 41.53 with standard deviation of 1.53.

4.3 Regression Analysis

To survey the correlation amidst mobile banking services and financial sector development in Kenya a regression analysis was performed. The dependent variable was financial sector development measured by the ratio of private credit to GDP while independent variables were; ratio of mobile banking users to bank deposit account users, ratio of mobile banking transactions to total bank transactions, bank size and the ratio of M2 to GDP. Data comprised of quarterly values for the ten year period from 2006 to 2015. The regression results are presented below.

Table 4.3 Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Standard Error of the Estimate
	0.952	0.907	0.897	1.35489
a. predictors: (Constant), Ratio of mobile banking users to bank deposit account users, Ratio of mobile banking transactions to total bank transactions, Bank size, Ratio of M2 to GDP				

Source: Research findings (2016)

Table 4.3 demonstrates that the coefficient of correlation (R) is positive 0.952. This implies solid positive interrelationship exists between mobile banking variables and financial sector development in Kenya. The co-efficient of determination (R^2) demonstrates 90.7% of the variations in financial sector development are influenced by

mobile banking variables. This leaves 9.3% of the variations to be influenced by other factors. The coefficient of multiple determinations (adjusted R^2) indicates the percentage proportion of variations of the dependent variable clarified solely or collectively by the independent variables. Results indicate 89.7% of the financial sector development in Kenya can be ascribed to the joint influence of the indicator variables.

Table 4.4 ANOVA

ANOVA ^b						
Model		Sum of Squares	DF	Mean Squares	F	Sig.
	Regression	628.505	4	157.126	85.593	0.001
	Residual	64.251	35	1.836		
	Total	692.755	39			
a. Predictors: (Constant), Ratio of mobile banking users to bank deposit account users, Ratio of mobile banking transactions to total bank transactions, Bank size, Ratio of M2 to GDP						
b. Dependent Variable: Financial sector development						

Source: Research findings (2016)

Table 4.4 shows the Analysis of variance. The significance as demonstrated by the p-value is 0.001 which is < 0.05 implying that the independent variables are predictors of the dependent variable. This regression relationship demonstrates high significance in anticipating the effects of mobile banking services on financial sector development in Kenya. F calculated at 5% level of significance was 85.593. This is higher the F critical, thereby indicating that the general regression model was highly indicative.

Table 4.5 Regression Coefficients

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
	(Constant)	16.101	11.649		1.382	.176
	Ratio of mobile banking users to bank deposit account users	12.202	3.037	.882	4.018	.001
	Ratio of mobile banking transactions to total bank transactions	12.127	52.441	.051	.231	.0049
	Bank size	.376	.304	.067	1.237	.0111
	Ratio of M2 to GDP	.257	.150	.095	1.713	.0473

a. Dependent Variable: Financial sector development

Source: *Research findings (2016)*

The regression model can be derived from table 4.5 as follows:

$$Y = 16.101 + 12.202 X_1 + 12.127 X_2 + 0.376 X_3 + 0.257X_4 + \varepsilon$$

Where:

Y= Financial Sector Development (measured as the ratio of private credit to GDP)

X₁ = Ratio of registered mobile banking customers to the total number of account holders during the period

X₂ = Ratio of total mobile banking transactions to total bank transactions

X₃ = Bank size measured by natural logarithm of aggregate assets

X₄ = Ratio of M2 to GDP to represent the macro economic factors affecting financial sector development in Kenya.

The above regression equation has demonstrated that holding all factors constant at zero financial sector development in Kenya will be 16.101. The findings also indicate that holding all independent variables constant; A unit increment in the ratio of mobile banking users to bank deposit account users would prompt to a 12.202 rise in the scores of financial sector development in Kenya. A unit increment in the ratio of mobile banking transactions to total bank transactions would prompt to a 12.127 rise in the scores of financial sector development in Kenya. A unit increment in the scores of bank size would prompt to a 0.376 rise in the scores of financial sector development in Kenya. A unit increment in the scores of ratio of M2 to GDP would prompt to a 0.257 rise in the scores of financial sector development in Kenya. Overall, the ratio of mobile banking users to bank deposit account users had the greatest effect on financial sector development in Kenya, followed by ratio of mobile banking transactions to total bank transactions, then bank size while ratio of M2 to GDP had the least effect on financial sector development in Kenya. All the variables were significant ($p < 0.05$).

4.4 Discussion of Results

The objective of this study was to establish the effect of mobile banking services on financial sector development in Kenya. From the regression model above, the study deduced that mobile banking variables affected the development of the financial sector, namely ratio of mobile banking users to bank deposit account users, ratio of mobile banking transactions to total bank transactions, bank size and ratio of M2 to GDP. They all influenced it positively. The study established the intercept at 16.101 for all years. The four independent variables that were studied explain a substantial 89.7% of financial sector development in Kenya as represented by adjusted R^2 (0.897). This hence implies

that the four independent variables contribute 89.7% of the financial sector development in Kenya while random variations and different variables not contemplated in this study contributes 10.3% to financial sector development in Kenya.

The study established the coefficient for the ratio of mobile banking users to bank deposit account users was 12.202, meaning that it positively and significantly influenced financial sector development in Kenya. The study established the coefficient for the ratio of mobile banking transactions to total bank transactions was 12.127, meaning it also positively and significantly influenced financial sector development in Kenya. This correlates with Wahome (2009) who advances that stiff competitions exist among banks in Kenya. Some open seven days a week in an effort to attract more clients. They are aggressively pursuing growth in personal loan products.

The study also deduced that the coefficient for ratio of M2 to GDP was 0.257, meaning that it positively and significantly influenced the financial sector development in Kenya. These findings correlate with Dang (2011). He established that liquidity levels positively affect financial performance banks. Dang (2011) utilised basic financial ratios like customer deposits to aggregate assets and gross loans to customers deposits. Various researchers utilised diverse financial ratios in assessing bank's obligation levels. Ndung'u (2011) agrees that mobile banking innovations have revolutionised cash exchange services and enhanced further inventions that have brought down transaction expenses for both the financial institutions and their clients. The change of cash exchange services leading to greater income and returns to the financial institutions. Kenya is among the

countries that pioneer in m-banking services. Various nations have replicated the mobile banking model as a result of the advantages it confers. This has however proved to be a threat to the normal cash transfer services such as the electronic funds transfer and the traditional clearing system.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This section provides a summary, conclusion and recommendations to the study founded on research findings. The study sought to establish the effect of mobile banking services on financial sector development in Kenya.

5.2 Summary

Mobile banking is a service offered by banks and monetary institutions in collaboration with mobile service providers. It permits clients with occupied schedules to conveniently save and transact utilizing their cell phones. It involves extending financial services to the unbanked, the individuals with no access to bank account and those at the base of the monetary pyramid, regularly residing in rural areas.

According to the regression model, the study established that there were mobile banking variables influencing the financial sector development in Kenya, namely ratio of mobile banking users to bank deposit account users, ratio of mobile banking transactions to total bank transactions, bank size and ratio of M2 to GDP.

5.2.1 Ratio of registered mobile banking customers

The study used the ratio of registered mobile banking customers to the total number of account holders during the period to assess the usage of mobile banking services. From the findings, the ratio of registered mobile banking customers to the total number of account holders during the period has been increasing. This could be a result of increasing number of mobile banking users who have been registered in the banks. The study established that in the year 2006, the ratio was 0.58 which increased to 1.16 in

2012, then 1.32 in 2013 and 1.34 in 2014. The highest value was recorded in 2015 with a ratio of 1.44. The mean was 0.97 with standard deviation of 0.3. This is a clear indication that mobile banking services have become more popular over the period.

The regression model showed that the ratio of mobile banking users to bank deposit account users had the greatest effect on financial sector development in Kenya. A unit increment in the ratio of mobile banking users to bank deposit account users would prompt to a 12.202 rise in the scores of financial sector development in Kenya. The relationship between the ratio of mobile banking users to bank deposit account users and financial sector development in Kenya was found to be positively significant (p-value = 0.001).

5.2.2 Ratio of total mobile banking transactions

The study utilized the ratio of total mobile banking transactions to total bank transactions over the time of study. The outcomes indicate that the ratio has been increasing over the period from 0.031 in 2006 to 0.086 in 2015. The ratio was 0.058 in 2012, 0.063 in 2013 and 0.071 in 2014. The mean value for all the years was 0.05 with a standard deviation of 0.02. The findings show that mobile banking transactions have been increasing over the period.

The regression model indicated that the ratio of total mobile banking transactions to total bank transactions positively and significant affected financial sector development in Kenya (p-value = 0.0049). A unit increment in the ratio of mobile banking transactions to

total bank transactions would prompt to a 12.127 rise in the scores of financial sector development in Kenya.

5.2.3 Bank size

The study further tried to determine the impact of bank size on financial sector development in Kenya. The findings show that bank size assessed by natural logarithm of total assets has been increasing over the period. The values were 27.14 in 2006, 28.48 in 2012, 28.63 in 2013, 28.81 in 2014 and 29.12 in 2015. The mean bank size value for all the years was 28.67 with standard deviation of 0.75. This implies that financial institutions have been growing over the years. The regression model showed that bank size positively and significant influenced financial sector development in Kenya (p-value = 0.0111). A unit increment in the scores of bank size prompts to a 0.376 rise in the scores of financial sector development in Kenya.

5.2.4 Ratio of M2 to GDP

The ratio of M2 to GDP was used to measure macro-economic factors affecting financial sector development in Kenya. The study findings showed that the ratio was 39.87 in 2006, 40.93 in 2011, 40.95 in 2012, 41.5 in 2013, 42.93 in 2014 and 42.2 in 2015. The mean value for all the years was 41.53 with a standard deviation of 0.75. This indicated that the ratio has generally increased over the ten year period. The regression results indicated that the ratio of M2 to GDP positively and significant affected financial sector development in Kenya (p-value = 0.0473). A unit increment in the scores of ratio of M2 to GDP prompts to a 0.257 rise in the scores of financial sector development in Kenya.

The intercept was 16.101 for all years of study. Four independent variables that were concentrated on explain a substantial 89.7% of financial sector development in Kenya as

represented by adjusted R^2 (0.897). This therefore implies that mobile banking services positively and significantly affects the financial sector development in Kenya. The ratio of mobile banking users to bank deposit account users had the greatest effect on financial sector development in Kenya, followed by ratio of mobile banking transactions to total bank transactions then ratio of M2 to GDP, while bank size had the least effect on financial sector development in Kenya.

5.3 Conclusion

Mobile phones have changed the mode in which banking is done in Kenya. Numerous clients carry out some essential financial transactions such as bank balance enquiries utilizing their mobile phones. Such basic transactions incorporate downloading mini statements, checking balance settling of bills, depositing cash in their accounts and reporting suspicious transactions. These mobile banking services involve a charge which contributes to the income and profits of the financial institutions. The financial institutions likewise publicize their new products to their clients using SMS and henceforth increasing their acumen. The cell phone has accordingly introduced helpful platforms for financial institutions and their clients prompting a win-win kind of arrangement. Clients get their services whenever the timing is ideal while banks acquire income and enhance their profit margins because of enhanced cost of doing business.

From the results of the study, the researcher concluded that mobile banking services have contributed positively to the financial sector development in Kenya. This could be ascribed to patterns registered in the factors where the ratio of mobile banking users to bank deposit account users, ratio of mobile banking transactions to total bank

transactions, bank size and ratio of M2 to GDP which all had a positive and significant influence to financial sector development in Kenya. Islam, Mahjabin, Rayhan and Sohel (2012) and Aker and Mbiti (2010) back these discoveries utilizing information from Africa and Bangladesh subsequently concluded that cell phones give leverage to banks to expand earnings and subsequently increase their return on assets by having extensive numbers of virtual versatile records particularly targeting the less banked population. Numerous banks are experiencing tremendous growth in income and profitability due to adoption and utilization of cell phones in the provision of services.

5.4 Recommendations

Due to the constantly evolving nature of mobile phone technology, policy makers should consider formulating more accommodative policies to switch to branchless models of banking services. This is clearly because of the significant and positive interrelationship between mobile banking and financial sector development in Kenya. The effect will be more evident should greater transition in technological innovations and more clients switch to mobile phone banking services be encountered.

The study also recommends that for the financial institutions to be more competitive, they need to adopt modern technology such as mobile banking, and internet banking services. Technological change is a vital element of a modern community and civilization. The main purpose of technological advancement in the development of banking, Micro financial institutions and its contribution on the economic growth of nations has been widely discussed. The study recommends that the financial sector should be able to assess the technical background of the majority of its clients before moving into the use

of advanced technology. This involves analyzing the literacy level of its major clients, the specific needs of its target clients and the potential benefits received by the clients through the use of modern technology. This can be attained by carrying out consumer surveys.

Mobile banking is utilized to enhance money related functions in business banks and other financial institutions. The financial institutions set up measures to enhance their competitiveness by preparing staff, infusing funds in research and development of technology in a world of burgeoning financial technology space. With leverage on technology expertise, mobile banking will consistently have great impact on the profitability of financial institutions because it reduces overall cost of doing business thus enhancing development of financial the sector.

The study further recommends that the financial institutions in Kenya should continue embracing and using m-banking in offering their services as the rates of mobile phone usage in the country continue to rise day by day. The popularity of mobile phones shows the extent to which they have become entrenched in the modern society. Furthermore, the linkage of cell phones and financial institutions has completely changed the banking business. For instance, M-Shwari a collaborated product of Commercial Bank of Africa and mobile phone service provider Safaricom, where registered members are permitted to borrow money from the bank and repay effortlessly through the MPESA platform. Recently Kenya Commercial Bank also partnered with Safaricom and launched a mobile loan facility through the MPESA platform. This has brought in another perspective of

banking services that affects the banking conveyance for greater rewards, financial inclusion and thus financial sector development.

5.5 Limitations of the Study

Mobile banking is a relatively new technology and not very many studies have been done especially on its impact on financial sector development in Kenya. The few studies which have been done have tend to concentrate on its adoption and impact on profitability of selected banks. Furthermore, the financial sector is a very competitive environment and as such, the most companies have not disclosed much information for fear of competition. On the same note, due to the insecurity risks involved in the banks, management in some instances were suspicious of any inquisitive personality especially on issues which are believed to be used by the competitors in extracting sensitive information. The extent of the study was limited by time to collect more data from the respective banks and micro-finance institutions, which may have led to improved conclusions. The study used secondary data only for the period 2006 to 2015. The findings could have been different if primary data was also collected from the institutions and by extending the period of study may be to more than ten years.

5.6 Suggestions for Further Research

The study recommends future studies should be done on the impact of mobile banking and financial sector development with a focus on financial markets, instruments and insurance in other countries within East Africa or Africa at large. Further research should be done on the influence of mobile banking on financial development. There is also a need to evaluate the impact of mobile banking services on financial deepening.

REFERENCES

- Agboola, A. A. (2006). Electronic Payment Systems and Tele-banking Services in Nigeria. *Journal of Internet Banking and Commerce*, 11(3), 34-50.
- Aker, J. C. & Mbiti, I. M. (2010). Mobile phones and economic development in Africa. *Center for Global Development Working Paper*, (211).
- Alam, I. (2003). Innovation Strategy, Process and Performance in the Commercial Banking Industry. *Journal of Marketing Management*, 19(11), 973-999.
- Al-Jabir, I. M. (2012). Mobile banking adoption: application of diffusion of innovation theory, *Journal of Electronic Commerce Research*, 13(4), 379-391.
- Al-Tamimi, H. & Hassan, A. (2010). Factors Influencing Performance of the UAE Islamic and Conventional National Banks. *Unpublished MBA thesis*, University of Sharjah.
- Ang, J. (2007). Are Financial Sector Policies Effective In Deepening The Malaysian Financial System? *Monash Economics Working Papers*, No: 02/07.
- Anyango W., Rotich, G. & Kathuo S., (2015). Effect Of Mobile Banking On The Financial Performance Of Banking Institutions In Kenya. *The Strategic Journal of Business and Change Management*, 2 (98), 1440 – 1457.
- Athanasoglou, P.P., Sophocles, N.B. & Matthaios, D.D. (2005). Bank-specific, industry-specific and macroeconomic determinants of bank profitability. *Working paper*, Bank of Greece. 1(1), 3-4.
- Bhattacharya, S. & Thakor, A. (1993). Contemporary Banking Theory. *Journal of Financial Intermediation*, 3, 2-50.

- Bhavnani, A., Won-Wai Chiu, R., Janakiram, S., & Silarszky, P. (2008). The role of mobile phones in sustainable rural poverty reduction. Washington, DC.
- Bisignano, J. (2012). *Banking competition, regulation and the philosophy of financial development: A search for first principles, ' in the internationalization of capital markets and the regulatory response* (6th Ed.), London: Graham and Trotman.
- Central Bank of Kenya (2012, 2015). *Bank Supervision Report*. Nairobi: Central Bank of Kenya.
- Ching, M. C., Chuan, A. T., Sim, J. J. Kam, H. & Tan, B. (2011). Factors Affecting Malaysian Mobile Banking Adoption: An Empirical Analysis. *International Journal of Network and Mobile Technologies*, 2 (3), 15-35.
- Committee of Central Bank Governors in SADC. (2012). *SADC Financial Systems: Structures, Policies and Markets*. Pretoria:
- Cytonn Quarter One (2016). Banking Sector Report. Retrieved June 19, 2016, from <http://www.cytonn.com>
- Dang, U. (2011). The CAMEL Rating System in Banking Supervision: A Case Study of Arcada. University of Applied Sciences, International Business.
- Daniel, E. (1999). Provision of electronic banking in the UK and the republic of Ireland. *International journal of banking marketing*, 17(2), 72-82.
- Darrat, A. F. (1999). Are financial deepening and economic growth causally related? Another look at the evidence. *International Economic Journal*, 13(3), 19-35.
- Diamond, D. W. (2000), Bank Runs, Deposit Insurance, and Liquidity. *Journal of Political Economy*. 91(3), 401-19.

- Donner, J. & Tellez, A. C. (2008). Mobile banking and economic development: Linking adoption, impact, and use. *Asian Journal of Communication*, 18(4), 318- 322.
- David Porteous (2009). Mobilizing Money through Enabling Regulation. *Innovations: Technology, Governance, Globalization*, 4(3), 75-90.
- Freixas, X. & Rochet J.C. (1998). Microeconomics of banking, MIT.
- Greenwood, J. & Boyan, J. (2000). Financial Development, Growth and the Distribution of Income. *Journal of Political Economy*, 98 (5), 1076-1107.
- Gurley, J. G. & Shaw, E. S. (1967). Financial Development and Economic Development. *Economic Development and Cultural Change*, 15 (3), 257-268.
- Hendrickson, J. M. & Nichols, M. W. (2011). Troubling times for the commercial banker: exploring the recent wave of failures. *Journal of Applied Finance and Banking*, 1, 1-37.
- Higgins, D., Kendall, J., & Lyon, B. (2012). Mobile Money Usage Patterns of Kenyan Small and Medium Enterprises. *Innovations: Technology, Governance, Globalization Journal*, 7 (2), 67-81.
- Huang, Y. & Temple, J. (2005). Does external trade promote financial development? *Department of Economics, Discussion Paper, No: 05/575*, 30-46.
- Huang, Y. (2005). What Determines Financial Development? *Department of Economics, Discussion Paper, No: 05/580*, 12-28.
- Ilhomovich, S. E. (2009). Factors Affecting the Performance of Foreign Bank in Malaysia. *Doctoral dissertation*, Universiti Utara Malaysia.

- Ivatury, G. & Pickens, M. (2006). Mobile phone banking and low-income customers: Evidence from South Africa. Washington, DC:
- Khan, M. S. (2002). Inflation, Financial Deepening, and Economic Growth. *Banco de Mexico Conference on Macroeconomic Stability, Financial Markets and Economic Development* (pp. 9-16). Mexico City: International Monetary Fund.
- Kithaka, E. (2014). Effect of mobile banking on financial performance of commercial banks in Kenya. *Unpublished MBA Project*, University of Nairobi.
- Kigen, K. P. (2010). The impact of mobile banking on transaction costs of microfinance institutions. *Unpublished MBA Thesis*, University of Nairobi.
- King'oo, H. (2011). The relationship between electronic banking and financial performance of commercial banks in Kenya. *Unpublished MBA, Thesis*, University of Nairobi.
- Koivu, T. (2002). *Do efficient banking sectors accelerate economic growth in transition countries?* Bank of Finland, Institute for Economies in Transition.
- Laukkanen, T. & Pasanen, M. (2007). Mobile banking innovators and early adopters: How they differ from other online users?' *Analysis Paper*.
- Levine, R. (2005). Finance and Growth: Theory and Evidence. In Philippe Aghion and Steven Durlauf(eds.). *Handbook of Economic Growth*, 865–934.
- Mahajan, V. & Peterson, R. (2005). Models for innovation of diffusion. Beverly Hills: Sage Publications.
- Malhotra, P. & Singh, B. (2009). The Impact of Internet Banking on Performance and Risk: The Indian Experience. *Eurasian Journal Business and Economics*, 2(4), 43-62.

- Mas, I. & Morawczynski, O. (2009). *Designing Mobile Transfer Services: Lessons from M-Pesa Innovations*.
- Mbiti I & Weil D. (2011). *Mobile Banking: The Impact of M-Pesa in Kenya* Working Paper 17129, 1050 Massachusetts Avenue, Cambridge, MA 02138.
- Mbogo, M. (2010). The Impact of Mobile Payments on the Success and Growth of Micro-Business: The Case of M-Peas in Kenya. *The Journal of Language, Technology & Entrepreneurship in Africa*, 2(1), 182- 203.
- Mbuvi, L. (2007). *M-PESA: Mobile Money for the “Unbanked” Turning Cell phones into 24-Hour Tellers in Kenya*. Kenya.
- McKinnon, R. (1973). *Money and Capital in Economic Development*. New Haven: Yale University Press.
- McKinnon, R. I. & Pill, H. (2007). Credible Economic Liberalizations and Overborrowing. *American Economic Review*, 34 (4), 189-193.
- Merwe, F.M. (2001). The Impact of Mobile Communication Technologies in Medium and Small Enterprises: Case Study of Nairobi City, *Unpublished MSc. Thesis*, University of Nairobi.
- Morawczynski, O. & Krepp, S. (2011). *Savings on the Mobile: Developing Innovative Financial Services to Suit Poor Users*. World Economic Forum, the Mobile Financial Services Development Report, 51-58.
- Mugenda, O.M. & Mugenda A.G. (2003). *Research Methods, Quantitative and Qualitative Analysis*-African Centre for Technology Studies.

- Muisyo, J., Alala, O. & Musiega, D.(2014).The Effects of Mobile Money Services on the Performance of the Banking Institutions: A Case of Kakamega Town. *The International Journal Of Engineering And Science*, 3, 14-24.
- Munaye. H. (2009). The application of mobile banking as a strategic response by equity bank Kenya limited to the challenge in the external environment. *Unpublished MBA Thesis*, University of Nairobi.
- Ndebbio, J. (2004). Financial deepening, economic growth and development: Evidence from selected sub- Saharan African countries: *AERC Research Paper 142 African Economic Research Consortium*. The Regal Press Kenya, Ltd, Nairobi.
- Ndege, R. (2006). Mobile banking needs an ecosystem, as well as a platform, to succeed. *Unpublished MBA Project*, University of Nairobi.
- Ngugi, R., Amanja, D. & Maana, I. (2009). Capital market, financial deepening and economic growth in Kenya. *Unpublished Capital Markets Paper*.
- Nyangosi, R., Arora, J. S., & Sing, S. (2009). The evolution of e-banking: a study of Indian and Kenyan technology awareness. *International Journal of Electronic Finance*, 3(2), 149–169.
- Porteous, D. (2006). *The enabling environment for mobile banking in Africa*. London.
- Rachel (2013) Effects of Mobile Banking On the Financial Performance of Commercial Banks in Kenya, *Unpublished MBA Project*, University of Nairobi.
- Rousseau, L., & Wachtel, P., (2011). What is happening to the impact of financial deepening on economic growth? *Economic Inquiry*, 1 (1) 1 – 40.

- Said, J. & Tumin, M. (2011). Performance and Finance Ratios of Commercial Banks in Malaysia and China. *International Review of Business Research Papers*, 7(2), 157-169.
- Saleem, Z., & Rashid, K. (2011). Relationship between Customer Satisfaction and Mobile Adoption in Pakistan. *International Journal of Trade, Economics and Finance*, 2(6), 537–544.
- Sangmi, M. & Nazir, T. (2010). Analyzing Financial Performance of Commercial Banks in India: Application of CAMEL Model, *Pakistan Journal Commercial Social Sciences*.
- Southern African Development Community. (2006). *Protocol on Finance and Investment*. Pretoria: www.sadcbankers.org.
- Scholtens, B. & Wensveen, D. (2003). The theory of financial intermediation: an essay on what it does (not) explain. *SUERF – The European Money and Finance Forum*, 50:10, 20- 16.
- Sevcik, P. (2004). Innovation diffusion. *Business Communication Review*, 34(9), 8-11.
- Shaw, E. S. (1973). *Financial Deepening in Economic Development* (Vol. 1). New York: Oxford University Press.
- Shirley, J. H. & Sushanta, K. M. (2006). *The Impact of Information Technology on the Banking Industry: Theory and Empirics*.
- Taghipour, A. (2009). Financial Restraint and Financial Development in Iran: The Conditional Co-integration Approach. *Review of Middle East Economics and Finance*, 5 (2), 1-20.

- Tchouassi, G. (2012). Can Mobile Phones Really Work to Extend Banking Services to the Unbanked? Empirical Lessons from Selected Sub-Saharan Africa Countries. *International journal of Development Societies*, 1(2), 70-81.
- Tiwari, R., & Buse, S. (2007), The mobile commerce prospects. *A strategic Analysis of opportunities in the Banking sector*, A joint research Paper by Institute of Technology & Innovation Management Hamburg University of Technology.
- Tiwari, R., Buse, S. & Herstatt, C. (2006). Mobile Banking as Business Strategy: Impact of mobile Technologies on Customer Behaviour and its Implications for Banks in: *Technology Management for the Global Future*, 1935 – 1946.
- Vaidya, S. (2011). Emerging Trends on Functional Utilization of Mobile Banking in Developed Markets in Next 3-4 Years. *International Review of Business Research Papers*, 7(1), 301 – 312.
- Valverde, C., Humphrey, S., & Fernandez, F. (2003). Deregulation, Bank Competition and Regional Growth. *Regional Studies*, 37, 227-237.
- Wambari, P. (2009). Mobile banking in developing countries. A case study on Kenya. Unpublished MBA Thesis, Vaasan Ammattikorkeakoulu.
- Wanja, N.C. (2014). Effect of internet and mobile banking of financial performance of commercial banks in Kenya. *Unpublished MBA Project*, University of Nairobi.
- Yartey, C. A. (2008). The Determinants of Stock Market Development in Emerging Economies: Is South Africa Different. *IMF Working Paper*, No: 08/38.
- Zift, D. (2006). Mobile phone Technology Opens up New revenue Stream. Downloaded on August 08, 2016.

APPENDICES

Appendix 1: Commercial Banks & Micro-Finance Institutions in Kenya

Commercial Banks

1. ABC Bank (K) Ltd
2. Bank of Africa
3. Bank of Baroda
4. Bank of India
5. Barclays Bank (K) Ltd
6. CfC Stanbic Holdings
7. Chase Bank (K) Ltd
8. Citi Bank
9. City Finance Bank
10. Cooperative Bank of Kenya
11. Commercial Bank of Africa
12. Consolidated Bank of Kenya
13. Credit Bank
14. Development Bank of Kenya
15. Diamond Trust Bank
16. Dubai Bank
17. Equatorial Commercial Bank
18. Equity Bank
19. Family Bank
20. Fidelity Bank
21. First Community Bank
22. Giro Commercial Bank
23. Guaranty Trust Bank Kenya
24. Guardian Bank
25. Gulf African Bank
26. Habib Bank A.G. Zurich
27. Habib Bank

28. Housing Finance Co.
29. Imperial Bank
30. I & M Bank
31. Jamii Bora Bank
32. Kenya Commercial Bank
33. Middle East Bank Kenya
34. National Bank of Kenya
35. NIC Bank
36. Oriental Commercial Bank
37. Paramount Universal Bank
38. Prime Bank
39. Sidian Bank
40. Spire Bank
41. Standard Chartered Kenya
42. Trans National Bank
43. United Bank for Africa
44. Victoria Commercial Bank

Source: CBK, (2015)

Micro-Finance Institutions

1. AAR Credit Services
2. Adok Timo
3. Aga khan First Micro Finance Agency
4. Biashara Factors Ltd
5. Bimas
6. Blue Limited
7. Canyon Rural Ltd
8. Elite Micro Finance
9. Faulu (K) Dtm Ltd
10. Fusion Capital Ltd
11. Jamii Bora Bank

12. Jitegemea Credit
13. Juhudi Kilimo
14. Sidian Advisory Services (Africa) Ltd, Nairobi
15. Kadet Ltd, Nairobi
16. Kenya Eclof
17. Kenya Women Finance Trust
18. Kenya Entrepreneur Empowerment Foundation
19. MIC Micro Finance Ltd
20. Micro Africa Limited
21. Molyn Credit Limited
22. Oikocredit International
23. Opportunity International
24. Pamoja Women Development Program
25. Platinum
26. Rafiki Micro Finance Bank
27. Renewable Energy Technology Assistance Program
28. Rupia Ltd
29. Sisdo
30. SMEP Micro Finance Bank
31. Swiss Contact East Africa
32. Taifa Option Microfinance
33. WEEC
34. U & I Microfinance
35. Yehu Microfinance Trust

Source: CBK, (2015)