EFFECT OF MOBILE BANKING ON FINANCIAL INCLUSION IN KENYA

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D61/86216/2016

A RESEARCH PROECT SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION, SCHOOL OF BUSINESS, UNIVERSITY OF NAIROBI

NOVEMBER 2017

DECLARATION

I hereby declare that this research project is my original work and has not been submitted to any other university for the award of a degree.

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ACKNOWLEDGEMENT

First I thank the Almighty God for giving me the strength and courage throughout the period of my studies and for his guidance. My acknowledgement also goes to University Lecturers and specifically Dr. Mirie Mwangi who has patiently given his profound advice and guidance during this time. Lastly, I wish to acknowledge my colleagues and fellow classmates who we have walked this journey together. God bless you all.

DEDICATION

I dedicate this research project to my fiancée and family for their patience and support during the time I was working on it. I also dedicate this research to scholars in the field of Finance and wish them well in their endeavors.

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ABBREVIATIONS AND ACRONYMS

AFI	-	Alliance for Financial Inclusion
CBK	-	Central Bank of Kenya
CGAP	-	Certified Government Auditing Professional
CGAP	-	Certified Government Auditing Professional
EPRC	-	Economic Policy Research Centre
GDP	-	Gross Domestic Product
ICT	-	Information and Communication Technology
IFC	-	International Finance Corporation
IMF	-	International Monetary Fund
MMS	-	Multimedia Message Service
SMS	-	Short Message Service
SSA	-	Sub Saharan Africa
UN	-	United Nations
USAID	-	United States Agency for International Development

ABSTRACT

The speedy acceptance of mobile financial services in Kenya has proven the possibility of reaching the underprivileged by means of mobile technology and caused interest globally about what is conceivable with these kind of technologies. This study attempts to establish the effect of mobile banking on financial inclusion in Kenya. The researcher used descriptive design. The researcher used quarterly secondary data for the period between 2007 and 2016. Data on the registered number people on mobile subscriptions on mobile banking and number of mobile banking was accessed from Communication Commission of Kenya, while data on number of transactions effected through mobile banking and number of banks which provide mobile banking services and the was accessed from Central Bank of Kenya (CBK) and Kenya National Bureau of Statistics (KNBS) respectively. Data collected was analyzed by use of descriptive statistics and inferential statistics. Descriptive statistics included trend analysis over the years for the variables under study. Inferential statistical techniques that were applied included Pearson's correlation and regression analysis which were used to draw a causal relationship between mobile banking and financial inclusion. Data was investigated by means of a statistical software - Statistical Package for Social sciences (SPSS) in order to assess and determine the correlation and regression analysis between the dependent variable (financial inclusion) and each independent variable. Data was presented using tables and figures. The correlation results show the association between the number of number of mobile money subscribers, number of mobile money agents, number of mobile money transactions and value of mobile money transactions and deposit bank accounts was strong and positive. Regression results show that there is a positive relationship between number of mobile money subscribers and the dependent variable (financial inclusion). It can be concluded that the number of mobile money transactions is a good predictor of deposit financial inclusion. The researcher recommends that mobile regulators to review the existing regulatory structure to come up with clear regulations to all mobile operators, for example on transaction volumes, business use of services, and security. Another research study combining mobile banking with other forms of financial innovation can be conducted also to assess if in fact mobile banking has a higher effect or is superior in terms of inclusion.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Financial inclusion is an important and fundamental concept of development policy globally (IMF, 2014). This originates from the understanding that inclusive financial system is crucial in minimizing abject poverty, furthering collective growth, and advocating for sustainable economic growth and development (World Bank, 2014). Financial systems that are inclusive enable low economy people to save and borrow, allowing them to bring together their resources, capitalize in education and business/entrepreneurship, and hence making their living standards better (Demirgüc¸ Kunt & Klapper, 2012). The underprivileged can furthermore smooth their intake/ consumption and insure themselves against socioeconomic susceptibilities.

Whereas countries that are advanced economically have better access to and provision of quality financial services, in most developing economies, many people still do not have access to basic financial services (CGAP, 2011). In sub Saharan Africa, eighty percent of the adult population does not have access to basic financial services and only thirty four are account holders at formal financial institutions (Demirgüc¸ Kunt *et al.*, 2014).

With the bigger proportion of its population being below the poverty line, Africa has least financial inclusion relative to other parts of the world. Seventy five percent of the population does not have accounts in financial entities which are formal relative to 61 percent in Latin America and the Caribbean, and 11 percent in countries which fall under the category of high income (Nandhi, 2012). Consequently, a number of

African governments have adopted financial inclusion as one of the means to spur economic growth and development. To achieve financial inclusion of the poor, the evolution of mobile money has been cited as a game changing agent (IFC Mobile Money report 2011). Mobile money technology is an avenue on which big proportions of the population can be extended on at a relatively less cost compared with traditional banking which is characterized by substantial input both in infrastructure and personnel (Jack & Suri 2011).

The milestones and progress in technology and specifically mobile phones have transformed provision of financial services and brought in new models of serving the underprivileged. About twelve percent of the population in Sub Saharan Africa holds accounts for mobile banking accounting while worldwide population stands at 2% for the same (Demirgüc¸ Kunt *et al*., 2014). Financial services offered through the mobile platform are moderately cheap, safe, can be relied on and accessible and have led to most of the poor people to advance their financial avenues to incorporate banking modernizations other forms of financial services. In particular, the expansive adoption of mobile phone technology has created new markets Sub Saharan Africa and has compelled financial services to get to consumers in inaccessible regions where banking services are not easily accessed (Jack & Suri, 2014).

1.1.1 Mobile Banking

According to Shallone and Simon (2013) mobile banking is the ability to do banking transactions using a mobile device to perform financial dealings through a terminal which is mobile. This explanation is an appropriate functioning one as it takes account of not only rudimentary services such as bank account statements and funds transfer and on the other hand considers electronic payment alternatives and financial services

that depend on information (for example, updates on account limit and/or balance, being privy to stock broking). Mobile banking is invaluable in addition to being a dominant instrument for pushing progress, supporting development, stimulating innovation, and increasing competitiveness (Asfaw, 2015).

The developing world has seen quicker and large adoption of mobile technology compared to other technologies introduced by man in his existence (Ivatury, 2009). Consequently, remarkable flow of text messages has been established that can go beyond an individual's communication requirements. Also, unique custom-made facilities like mobile banking are by the day featured as a necessity to the population that does not have access to formal services (Tarazi & Michael, 2012). Banking through the mobile platform involves the unusual expansion of network for mobile gadgets like phones in the economies that are developing and this gives an opportunity to operate bank accounts which are virtual over a mobile gadget i.e. a mobile phone. Mobile banking offers financial facilities like transfer of cash, payment of bills, savings and financial services not having to rely on cash to formerly population proportions which didn't have access to formal financial services (Claire & Katakam, 2013).

Mobile banking is a terminology applied when describing effecting transactions in bank or obtaining bank account information through mobile gadgets. Initially, transactions effected through mobile banking were completed via short message service (SMS) technology (Asfaw, 2015). Short message service banking offered users with the capability to acquire information on their balances in accounts; report generation on pay or credit; and change inquiry for in security personal identification numbers and secret code/passcodes. The entry of the first smartphones which could

connect wirelessly gave the usage of the mobile platform for banking transactions. According to US Federal Reserve report (2012) banking on mobile platforms and mobile discharges do contain the chance to grow monetary facilities to those that do not have access to banking services or even those that are not well banked by lessening costs involved in transactions and increasing the obtainability of monetary goods and services (Morawczynski, 2009).

The United Nations (UN), World Bank, and United States Agency for International Development (USAID) altogether put emphasis on the effect and importance of mobile phones in supporting to reduce poverty, including but not restricted to accessibility to outdated banking facilities through mobile technology (World Bank, 2012). According to the United Nations, there are actual economic gains of mobile technology adoption: "The present evidence shows that acceptance and implementation of mobile phones reduces charges incurred to gain access to information and also reduce doubt in making decisions… Transaction charges can hence be minimized and market transparency should go up in scale." (Fernández-Ardèvol, 2011).

M-PESA has continued to be one of the most fruitful mobile money transmission packages globally attributed to several explanations; taking into account the fact that costs attributed to transactions for the platform are relatively lower relative to other banking avenues. According to the World Bank (2012) M-PESA was consistently one-third to one-half as costly as alternative avenues. Lesser charges directly convert into cash can be retained by those that are poor..." In 2010, the Consultative Group to Assist the Poor associated comparatively 26 international financial institutions that did not have branches and found out that that this way of banking, which included

banking through the mobile platform, was 19 percent economical averagely compared to other substitute banking amenities (McKay & Pickens, 2010). Nevertheless, where lesser transaction charges are no there, mobile money programs take more time to kick start, like in Botswana where the transactional charge is at least $1.07 (8 pula) per transaction (World Bank, 2012).

The notable development of mobile banking globally has made a special opprtunity for bringing financial in addition to societal amenities using mobile network (Claire & Katakam, 2013). Mobile banking reduces time and space limitations from banking transactions like, balance inquiry and fund transfer across accounts not necessarily being physically in those branches (Donner & Tellez, 2008). It improves efficiency, gives proximity to financial and banking amenities, creates innovative chances for revenue generation and increases governance and helps give the underprivileged persons with a voice (Gardachew, 2010).

1.1.2 Financial Inclusion

Financial inclusion refers to the transmission of financial services at prices that are reasonably charged to poor and underprivileged proportions of population, contrary to financial exclusion where those services are not accessible or cheap (Demirguc, 2008). For a nation to achieve complete inclusion, the following are of great importance; financial services should be reachable to everyone: this is every so often seen as the objective of financial inclusion. Financial services provided should also be of value: quality financial inclusion is characterized by: convenience, product-fit, safety, dignity of treatment, affordability and client protection. Financial inclusion includes providing complete collection of fundamental financial services; this means a

collection of basic financial services that comprises basic loans, deposits, insurance cover and payment services (Gardeva & Rhyne, 2011).

Omission from the formal financial system has progressively been identified as a hindrance to eliminating poverty (Donovan 2012). Undeniably, inaccessibility to services of financial nature like loans and savings minimizes peoples' capability to invest, save and react to surprises (Aker and Wilson 2013). At the macro level, small levels of financial inclusion prompt lesser economic growth and worsen income disparity (Demirgüç- Kunt *et al.*, 2008). Financial inclusion is defined as the lack of barriers which may be price or non-price in use of financial services (Sharma and Kukreja 2013). Financial inclusion takes into account every platform that attempts to make formal financial services reachable, available and that are reasonably priced to every segment of the populace (AFI, 2013).

Access has various scopes: services need to be obtainable when wanted, and products need to be custom-made to precise requirements; the cost for these facilities should be reasonably priced, counting all non-price costs, like having to move for long distances to bank branches; and, primarily, it ought to as well make business sense, transform into returns for the providers of these facilities, and consequently be accessible on a continuous basis. Access is problematic to measure. Usage is in many times adopted as a representation of access, though it can misjudge the number of families having access since it fails to take into account individuals who as at now/presently can access financial services but do not utilize it (Demirguc, Levine & Ross 2009).

According to Gakure, Anene, Arimi, Mutulu and Kiara (2013) many people across the emerging world have no access to banking services. Confronted by hindrances associated to cost, geography and education, these persons have cannot safely transfer

finances, save cash, insurance or accessing loan (Sukhbir & Yogita, 2015). These four facilities assist in different desires that each family encounters, and guaranteeing access to this product category is a vital aim of financial inclusion. Loans allow families to utilize future income to manage present liabilities or to exploit on investment prospects. Savings offer a secure and value-retaining place where families can store funds, permitting them to tap into "past income" as desired. Insurance shields against susceptibility to surprises (e.g. demise, sickness, or disability in the family). Payments services permit individuals to perform financial dealings without having to be face-to-face (Cohen, 2002).

1.1.3 Mobile Banking and Financial Inclusion

Money transacted through the mobile platform has an effect on financial inclusion process as it gives an assortment of markets instruments permitting access to financial services (Sarma, & Pais, 2010). Arguably being the platform that has the highest usage, the concept of banking through mobile platforms allows operators to execute banking dealings like account balance checking, transfers of cash, and payments of bills over mobile gadgets like phones. Saving through mobile platforms are creative ways of motivating a culture of saving not necessarily having minimum balances in their accounts and other old-fashioned banking charges (Donovan, 2012).

Credit products like loans offered over mobile technology have been introduced to provide micro loans to poor folks as an addition to old-fashioned loans and savings clusters/groups (Ngugi, 2015). Mobile banking is assisting mobile operators and the financial sector work together to bring inexpensive services which give convenience, security and safety to millions people who did not have access to banking services in the past. Mobile banking offers an avenue for efficient exchange of products by

minimizing the duration of time taken in transactions at the point of sale, thereby providing flexibility by letting clients to utilize all these multiple services on one device (Jenkins, 2008).

At a much advanced accessibility level, transactions are effected at lesser costs (Aker & Wilson, 2013). In the present day, those registered on mobile technology are privy and have embraced banking through the mobile platform for transactions and amenities such as local and international transmittals, bill payments, payroll deposit, credit receipt and reimbursement. It also eases the movement of cash from one person to another by a communications structure that already links billions of customers globally (Jack & Suri, 2010). Banking through the mobile platform permits payments to bring up risk sharing and also bring up consumption smoothing. It lessens the cost and risk inherent in working using cash money. Mobile airtime also acts as new market instrument where phone corporations have permitted people to buy airtime and to transmit this credit to new users. Recipient user therefore can vend the airtime received to a resident broker/agent who in turn pays using cash, or undoubtedly for goods, therefore finishing a transmission of purchasing power from the original transmitter to the receiver. Mobile phone firms came to know of the chance (in any case, there are above 3 billion individuals globally who are not privy to formal services provided by banks) and a new market came into being (Ngugi, 2015).

1.1.4 Mobile Banking and Financial Inclusion in Kenya

In 2012, Safaricom Ltd, a principal mobile service supplier in Kenya in collaboration with Commercial Bank of Africa, one of the Kenya's registered commercial bank, starrted a package named M-SHWARI that automatically opens a bank account for clients registered with M-PESA and functions in totality the same way a bank account

does. Through such collaboration, the general public will furthermore benefit with more people brought on board in the formal financial sector (Kabbucho & Coetzee, 2010).

According to Ishengoma (2011) the delivery of banking services through technology calls for intensive information security. If such information security is not well put in place, it results in frauds that have capability to weaken public confidence in the adoption of electronic payment products though strong safety actions (Ishengoma, 2011). The customers might feel skeptical and may not trust such innovations as mobile banking and consequently may not adopt them in their services (Omwansa & Waema, 2014).

Kenya has done well in importantly increasing the spread of financial services in the recent past. If mobile money transfer services, savings and credit cooperatives and micro finance institutions are included, formal financial inclusion increased from 26.4 percent in 2006 to 40.5 percent in 2015. (CBK annual report, 2016). There are various determinants that have led to bigger levels of inclusion; the expanding reach of three major types of financial service providers, the identification of financial inclusion as a national priority (as stated in the Kenya vision 2030 national planning document) and the accessibility brought about by innovative electronic payment systems (FinAccess, 2016).

1.2 Research Problem

Initially financial, telecommunication and other institutions concentrated on homegrown and local markets but of late have stretched its variety in terms of markets and services to an international, multinational, and even global reach (Ngugi, 2015). Such dynamism of the environment has forced them to redesign their strategies and

redefine their business priorities to focus on delivery channels differentiation and increase financial inclusion (Kleijnen, Ruyter & Wetzels, 2013). Failure in constantly redesigning strategies that adapt the institutions to their environment may lead to a strategic mismatch between what an organization offers and what markets demand (Etim, 2014).

According to FinAccess (2016), in Kenya formal financial inclusion has risen more in the urban areas with Nairobi County being on the lead. For instance from 2006 to 2016, persons who could access formal banking services in urban areas increased from 31 percent to 40 percent, while those who could access in rural areas rose only from 15 percent to 17 percent. The speedy acceptance of mobile financial services in Kenya has proven the possibility of reaching the underprivileged by means of mobile technology and caused interest globally about what is conceivable with these kind of technologies (FinAccess, 2016).

A number of studies have been researched on mobile banking and financial inclusion. Etim (2014) studied mobile banking and mobile money adoption for financial inclusion in Nigeria and findings indicated that financial inclusion had increased as a result of mobile banking and mobile money adoption. Another study was done in Zimbabwe by Mago and Chitokwindo (2014) on the influence of mobile banking on financial inclusion in Masvingo Province and the researcher came to find that poor people were prepared to use banking over mobile gadget platforms citing that it is easily available, appropriate, inexpensive, user-friendly and safe as the reason they would do it.

Ngugi (2015) did a study in Kenya and researched on the association amid mobile banking and financial inclusion in Kenya and established that services offered

banking mobile technology contributed to financial deepening. However, though the studies did have major contributions in significance and scope, they used other study variable leading to a conceptual gap and paucity in literature, as they were not addressing mobile banking and financial inclusion in Kenya. This is the gap that the study attempted to address by studying mobile banking and financial inclusion in Kenya. The study sought to answer the following research questions: What is the effect of enrollment to mobile money services on financial inclusion in Kenya? How does mobile money distribution affect financial inclusion in Kenya? What is the effect of user transactions on financial inclusion in Kenya? How does value of transactions influence financial inclusion in Kenya?

1.3 Research Objective

The study attempted to establish the effect of mobile banking on financial inclusion in Kenya.

1.4 Value of the Study

This research is of use to various stakeholders.

The recommendations of this study will be of help to the Government through the Communication Authority of Kenya, the Central Bank of Kenya and policy makers to design more progressive and effective policies aimed at ensuring good advancement of performance financial and telecommunications sector. The study will also seek to identify policy gaps that can be fed to policy development for the betterment of overall financial inclusion in the general population.

The study also helps academicians, scholars and practitioners and contributes to the body of knowledge through suggesting areas of improvement. Academicians and

researchers in the financial sector are able to access this study from the public repository domains like journals and online open access academic sites once the findings of the study are published. They are able to add value on the gaps identified by this study. It also contributes to the body of literature on mobile banking and financial inclusion.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter presents conceptual and theoretical frameworks that enlighten mobile banking and financial inclusion as well as the empirical literature that has been completed on the subject.

2.2 Theoretical Review

This section presents the theories on which the study is underpinned on in view of the variables under study. The theories include: Innovation Diffusion Theory, Financial Intermediation Theory and the Silber's Constraint Theory of Innovation.

2.2.1 Financial Intermediation Theory

Financial intermediation refers to a situation in which units with extra deposit moneys with financial institutions and the units in turn loan to deficit units. Bisignano (1992) recognized that financial mediators can be classified in four types. In the first type, the key categories of obligations or credits are definite for a fixed sum not linked to the portfolio performance. Second, the categories of obligations (credits) are normally not long-term and of a much lesser term compared to their assets. Third, a large percentage proportion of their obligations is in a position to be chequed and can be cashed when needed and fourthly, their obligations and assets are by far not transferable. The most significant influence of mediators is a consistent movement of finances from excess to shortage units.

Diamond and Dybvig (1983) examines providing of liquidity that is conversion of assets which are not liquid into liquid obligations by financial institutions. In their methodology similar savers or investors are not risk takers and unsure about the judgment of their forthcoming consumption requirements without an intermediary all investors are constrained into long term investments which are not liquid and that yield great returns to those who consume later.

Scholtens and van Wensveen (2003) show that the function of the financial intermediary is fundamentally perceived as that of making specified financial products. These are made every time an intermediary discovers that it can offer them for sale for prices which are anticipated to shield all costs associated with their production, falling under the category of both direct and opportunity costs. Financial intermediaries are in existence as a result of market imperfections. As such, financial intermediaries would not be present in a 'perfect' market condition, with no costs associated to transaction or information. Many markets have characteristics such as informational dissimilarities between purchasers and suppliers. In financial markets, information asymmetries are principally noticeable. Borrowers classically are aware of their security, creativity, and moral integrity better than the creditors. Then again, businesspersons have inside information about their own developments for which they pursue funding (Leland & Pyle, 1977). Moral hazard hinders the transmission of information amid market participants, which is a significant determinant for developments of good value to be funded.

Financial intermediation is perceived as the level to which institutions dealing with financial services bring negative spending components and positive spending components together (Ndebbio, 2004). A vital question that models and concepts try

to give a solution to is why do investors principally loan to financial institutions like banks who then advance to those that borrow, instead of loaning directly? Opinions emphasize it to the fact that financial are able to efficiently assess individuals that borrow and therefore play the part of given monitoring (Diamond, 1984). Diamond indicates that minimized monitoring charges are basis for this relative advantage. Diamond points out that financial intermediaries offer services by offering secondary financial assets to purchase primary financial assets. If an intermediary did not provide any services, those who invest and who purchase secondary assets offered by the intermediary may as well buy the primary securities directly and without having to incur the intermediation charges.

Abrasions found in financial markets can be an important instrument for producing tenacious income disparity or scarcity traps. These market abrasions include information asymmetry and charges associated with transactions and do have an important role in determining important judgments regarding human and physical capital accumulation and occupational alternatives (Demirguc-Kunt, Asli, Beck & Honohan, 2008). This theory is relevant to this study in that it captures financial inclusion which is explained by financial intermediation. The underpinnings of this theory can be used to help to understand how financial intermediation interrelates to financial inclusion and thus how such inclusion is affected by financial innovations in the commercial banks.

2.2.2 Innovation Diffusion Theory

This theory was ceremoniously presented by Bradley and Stewart in 2002 and it holds that organizations take part in the adoption of innovation so as to achieve comparative advantage, minimize costs and defend their positions strategically. The innovation

diffusion theory presented by Rogers in 1962 is a recognized and well respected theory that enlightens in what way an innovation is absorbed amongst consumers over a period of time (Liu & Li, 2009). It as well aids to comprehend purchaser's personality through acceptance and implementation or non-adoption of such an innovation (Vaugh & Schavione, 2010). The theory portrays that those that make use of any innovation assume a bell-shaped distribution curve which can be categorized into five portions in terms of innovativeness (Liu & Li, 2009). Rogers categorized users as innovators, early adopters, early majority, late majority and laggards (Liu & Li, 2009).

The reception, implementation and usage of banking over mobile avenues has the power to spread the limited personality and influence of the financial sector which is formal to the underprivileged and rural populace in Africa (Nyangosi, Arora & Sing, 2009). Even though most of research is not reviewed through peers, they give valued information on authentic consumption and relative information on the progress and usage of the phenomenal practice. Ivatury and Pickens (2006) gave valued perception into the features of the initial users of WIZZIT, one of the principal main enterprises devoted to giving mobile banking to the underprivileged in South Africa. Also important are the ethnographic work of Morawczynski throughout the one and a half year stay in Kenya (Hasan, Maccario & Zazzara, 2002).

By relating the models and frameworks associated to traditional technology acceptance to the acceptance and implementation of transformational financial innovation, this research study purposes to bring the argument to the conventional technological and innovations works. This theory is used to provide underpinnings on how mobile banking affects financial inclusion in Kenya.

2.2.3 Silber's Constraint Theory of Innovation

Silber (1975) attributes financial innovation to attempts by profit maximizing firms to reduce the impact of various types of constraints that reduces profitability. The theory argues that the goal of profit maximization of financial institutions is the main aim of financial innovations. Silber observes that there are some limitations (including external handicaps and internal handicaps such as administrative management) in the course of pursuing profit maximization. Even though these boundaries not only assure the steadiness of management they lessen the efficiency of financial institutions so the organizations have to struggle to cover the cost off (Silber, 1975).

Research writings have shown that organizations that are not highly profitable in their particular segment are strangely innovative. Furthermore, their reduction in profitability, which can be can be assumed to be from external competition or government regulation, has given these organizations with the required inspiration to come up with new ways in a bid to spur profitability. This is in agreement with the propositions in the research of Silber that investment in innovation is a rational reaction to competition that is not favorable therefore brings more profitability and better performance (Silber, 1983).

This theory is relevant in this study as it captures financial innovations. Mobile banking constitutes financial innovations and as such the theoretical underpinnings of Silber's Constraint Theory can be used to help understand the independent variables' and how they are likely to relate with financial inclusion

2.3 Determinants of Financial Inclusion

A common basis of inclusion services that is by and large acknowledged universally is the proportion of people who own bank accounts. The number of deposit accounts as proportion of the number of families is taken to be a better indicator of banking diffusion compared to other deposit accounts as percentage of number of families, (Agarwal, 2008). In getting to know the level of financial inclusion, it is important to know the exposure of populace to formal bank offices in both rural and urban areas. Superior financial inclusion does not by itself suggest better wellbeing. The fundamental postulation is that being privy to formal financial services is has a lower magnitude in terms of demanding on susceptible groups who have to pay more cost for informal services (Donovan, 2012).

Financial access can generally be categorized into two broad groups; one based on the supply side information from the angle of lenders, such as financial institutions and other service providers. The other based on demand side information from the angle of consumers, families or organizations. Some of the commonly used pointers for assessing financial inclusion are: bank accounts numbers (for example, per 1000 adult population), bank branches number (per million people), number of automatic teller machines (per million people), amount & volume of bank loans/credit and levels of deposit made in banks. Nevertheless, these pointers of financial access offer only limited information on the inclusiveness of the financial system of an economy and thus, in turn, fail to get all the facts sufficiently to the complete level of financial inclusion. Formally encompassed families are assumed to be those who utilize financial services offered by banks or by other formal financial service providers (Etim, 2014).

Availability of services of financial nature by individuals in rural areas has been mentioned as a basis of financial inclusion in studies done globally. Mahmood and Sahai (2011) talk about this as a logistical element/variable in that services of financial need are advanced in many areas where it is taken as viable by those that provide the service. Banking via mobile phones has been found in this study to be taken as easily available relative to other financial innovation approaches (Gakure, Anene, Arimi, Mutulu & Kiara, 2013)

In India income, population, literacy, deposit and credit penetration have been found to meaningfully affect financial inclusion (Chithra & Selvam, 2013). Environmental structure is vital in determining the banking behaviors of the multitudes in India. Camara, Peña & Tuesta (2014) in a study in Peru, showed that education and levels of income are key determinants for financial inclusion levels. In Africa, population density is greatly more critical for financial inclusion than any other place. Above and beyond, they established that mobile banking increases financial access (Allen *et al*., 2014).

2.4 Empirical Literature

Various studies have been conducted in mobile banking and financial inclusion. Etim (2014) investigated banking through mobile avenues and mobile money acceptance for financial inclusion. The research was aimed towards examining the utilization of mobile gadgets and services provided over mobile money. The researcher examined whether respondents in the research viewed mobile phones as user friendly for several responsibilities including mobile banking and mobile money transfers and whether such services were accepted. The researcher gathered from the study results that while rudimentary mobile phones were extensively accepted and utilized mainly for

communication with commonly family and friends, they were seldom utilized for servicing great order tasks like mobile banking or mobile money transfers.

Saliu (2015) evaluated the influence of transfer services incorporated through mobile money affect the socioeconomic status of the mobile money dealers in Kumasi Metropolis, Ghana. The populace of the study was MM vendors in Kumasi Metropolis from which a sample of 104 participants was selected for the enquiry with the help of Statistical Package for Social Sciences software. The responses indicated that there is important influence of income levels, employment characteristics and living standards on the socio economic status of the mobile money vendors in Kumasi Metropolis. The research showed a positive and strong association between mobile banking and financial inclusion in Ghana.

Mago and Chitokwindo (2014) in empirically investigated the influence of mobile banking on financial inclusion at Masvingo Province, Zimbabwe. The sample for the research study included 270 respondents who were categorized into 50 from the formal sector, 50 respondents from informal sector and 20 tertiary scholars. The districts of Chivi, Bikita, Gutu and Masvingo districts were chosen and constituted of the sample to represent the rest of the populace in the province. The research results showed that the poor individuals were prepared to accept mobile banking and the explanations for that were that that it is easily available, convenient, relatively inexpensive, user friendly and safe.

Ishengoma (2011) studied banking via mobile phones system coverage for financial addition in Tanzania in the Coast region at Kibaha district council. The target populace for this research involved of individuals registered who were subscribed to mobile services and the agents who offered mobile banking system whereby

approximately 20.4 million Tanzanians are registered with mobile service provider companies. The findings of the study exhibited a positive association and statistically important link between mobile banking and financial inclusion.

Achieng (2011) investigated how responses of strategic nature in Kenya Commercial Bank did affect mobile money transfer in Kenya and the study findings indicated that the service industry could be defined as developing, fast growing and with great rate in Kenya market and any emerging nation. The research showed that with the planned placing of the mobile telecommunications suppliers and the necessity for financial establishments to come together and join in with the Mobile money transfer offers leverage so as to continue being relevant and have a stake in the vast potential presented to mobile subscribers.

Ngugi (2012) empirically investigated mobile banking and financial inclusion in Kenya. Using a descriptive research methodology, the researcher used secondary data for the period 2006 to 2014. The researcher made use of a multiple regression analysis to test the link between financial inclusion and mobile banking services and the researcher established that mobile money transfer services are positively associated to financial inclusion in Kenya. The researcher in addition established that services offered through mobile banking have led considerably to financial markets deepening majorly out of financial products linked to established mobile money avenues.

In India, Kathuria, Uppal and Mamta (2009) evaluated the influence of penetration of mobile technology on economic growth throughout states in India. The researcher used three equations for a structural model for 19 states in India from 2000 to 2008. The researcher studied the associations through which mobile phones influence growth and the restraints, if any, that limit their influence. The researcher established

that Indian states with more mobile penetration rates can be anticipated to develop more rapidly, and that there is a critical mass, at a penetration rate of twenty five percent, above which the influence of mobile phones on growth is improved by network effects. Telecom networks are determined by network behavior; the development effect is bigger when an important threshold network size is realized.

An empirical research by Mutsune (2014) examines financial inclusion using mobile banking in Kenya. The researcher studies Kenya‘s extremely successful cash transfer model, MPESA, in an energy to examine the nature and part of financial inclusiveness in stimulating economic activity. The researcher concentrated on assessing a structure that can be utilized to approximate how Kenya’s financial inclusion over banking using mobile phones has influenced economic dynamism. The researcher found in his study findings that there is a positive and significant correlation between the two variables (financial inclusion and mobile banking). The researcher made recommendations that flexibility in this innovative form of technology adoption should be embraced by policy makers.

2.5 Summary of Literature

In developing countries, where financial exclusion is particularly related to geographic isolation, inadequacy or lack of infrastructure, in order to contribute to the challenge of financial inclusion, monetary authorities develop various incentive means. These means range from the increasing branches to the adoption of financial innovations (Etim, 2014). Unlike traditional banking practices, financial innovations like mobile banking are implemented through new information and communication technologies other electronic channels like mobile service providers (Gardeva & Rhyne, 2011).

Various studies have found that mobile banking has a direct impact on financial inclusion. Though there have been positive results and improved inclusion in Kenya as a result of financial inclusion. However, questions arise as to whether mobile banking does influence financial inclusion. This research aimed at studying mobile banking and financial inclusion in Kenya.

2.6 Conceptual Framework

A conceptual framework is a diagrammatical representation of the suggested relationships between the variables in the study (Mugenda & Mugenda, 2003).

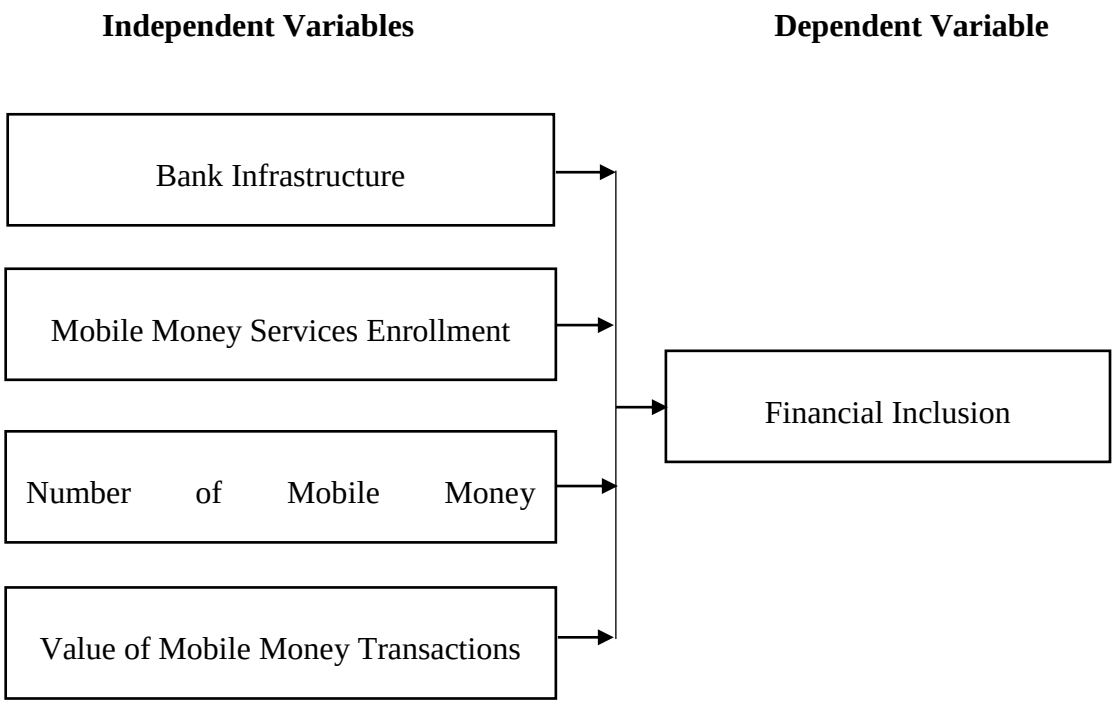

Figure 2.1: Conceptual Framework

Source: Researcher (2017)

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter gives details on the approaches that the researcher incorporated to make preparations for the study, gather data and analyze the data. The specific sections contained therein are the research design, population, data collection method, data analysis and presentation for the study.

3.2 Research Design

Research design is the plan that the researcher uses in the study for the gathering, measurement, scrutiny and analysis of data. It is the strategy and arrangement of speculation for which the researcher bases his argument on so perceived as to get solutions to research questions raised (Coopers & Schindler, 2006). The researcher used descriptive design. Descriptive studies are conducted in investigative research, to enable researchers to get information, summarize, present data and deduce its meaning for the reason of explanation (Creswell, 2003). According to Babbie (2004) descriptive design is adopted when gathering information in relation people's attitude, sentiments and behaviors. The researcher decided on the choice of descriptive research design gave facts on the status of study variables.

3.3 Data Collection

For the researcher to find out and define the association between mobile banking and financial inclusion in Kenya, the researcher used quarterly secondary data for the period between 2007 and 2016. Data on the registered number people on mobile

subscriptions on mobile banking and number of mobile banking was accessed from Communication Commission of Kenya, while data on number of transactions effected through mobile banking and number of banks which provide mobile banking services and the was accessed from Central Bank of Kenya and Kenya National Bureau of Statistics respectively. Other journals with related data on financial access and deepening in Kenya and mobile banking services were similarly be utilized. This helped ease satisfactory truthful and precise information essential for the purposes of this study.

3.4 Data Analysis and Presentation

Data collected was examined by employing descriptive statistics and inferential statistics. Descriptive statistics included trend analysis over the years for the variables under study. Inferential statistical techniques that were applied will included pearson's correlation and regression analysis which were used to draw a causal relationship between mobile banking and financial inclusion. Data was investigated by means of Statistical Package for Social sciences in order to assess and determine the correlation and regression analysis between the dependent variable (financial inclusion) and each independent variable.

Pearson's correlation technique was used to assess the strength and association between the independent variables and financial inclusion. Regression analysis was also adopted where the researcher assessed fitness of the model (R Square), ANOVA (Analysis of Variance) and regression of coefficients were adopted in analysis. Data was presented using tables and figures. The fitness of the model explained the extent to which all the independent variables jointly explain financial inclusion. ANOVA

statistics explained the overall significance of the model using the 0.05 conventional level of significance.

In particular, the following regression model was used;

$$\mathbf{Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \mu}$$

Where;

Y= Financial Inclusion - Accessibility in terms of the number of deposit bank accounts (per 1000 adult population)

X_1 = Enrollment to mobile money services- number of people who have subscribed for the mobile money services and how it influences inclusion

X_2 = Number of mobile money distribution - number of mobile money agents who exchange mobile money for real cash

X_3 = Influence of user transactions on financial inclusion - number of transactions performed using mobile phones

X_4 = Influence of value of transactions on financial inclusion – Amount of money transacted over the mobile money services and how this affects inclusion

α = constant

μ= error term

$\beta_1, \beta_2, \beta_3, \beta_4$ = beta coefficients

CHAPTER FOUR

FINDINGS, PRESENTATION AND DISCUSSION

4.1 Introduction

This chapter presents the analyzed data, findings and discussion. Descriptive statistics results were presented first followed by correlation and regression results.

4.2 Descriptive Statistics

Table 4.1 presents the descriptive statistics on the number of mobile money subscribers, number of mobile money agents, number of mobile money transactions and value of mobile money transactions.

Table 4.1 Descriptive Statistics

Variables	Minimum	Maximum	Mean	Std. Deviation
Mobile Money Subscribers (Millions)	6.4	38.9	25.79	9.44
Number of Mobile Money Agents (Thousands)	307	514.577	203.423	168.369
Number of Transactions (Millions)	0.02	428.38	146.96	118.64
Value of Transactions (KSh billions)	0.06	900.09	363.69	277.2

Source: Researcher (2017)

4.2.1 Number Mobile Money Subscribers

The researcher sought to assess descriptive statistics for the number of mobile money subscription from 2007 to 2016. From the findings 2007 recorded the least number of mobile money subscribers of 6.4 million persons with 2017 recording the highest of

38.9 million people. The arithmetic mean for mobile money subscribers was 25.79 million with a measure of dispersion from the mean (standard deviation) being 9.44 million persons.

4.2.2 Number of Mobile Money Agents

The researcher sought to assess descriptive statistics for the number of mobile money agents from 2007 to 2016. From the findings 2007 recorded the least number of mobile money agents of 307 thousands with 2017 recording the highest of 514.5 thousands. The mean for the number of mobile money agents was 203.423 thousand persons with a measure of dispersion from the mean (standard deviation) being 168.369 thousand persons.

4.2.3 Number of Mobile Money Transactions

The researcher sought to assess descriptive statistics for the number of mobile money transactions from 2007 to 2016. From the findings 2007 recorded the least value of mobile money transactions of 0.02 million persons with 2017 recording the highest of 428.38 million people. The arithmetic mean for the number of mobile money transactions was 146.96 million with a measure of dispersion from the mean (standard deviation) being 118.64 million persons.

4.2.4 Value of Mobile Money Transactions

The researcher sought to assess descriptive statistics for the value of mobile money transactions from 2007 to 2016. From the findings 2007 recorded the least number of mobile money transactions of 0.06 million persons with 2017 recording the highest of 900.09 million people. The arithmetic mean for mobile money transactions was

363.69 million with a measure of dispersion from the mean (standard deviation) being 277.2 million persons.

4.2.5 Test of Normality

The researcher sought to assess the normality of the data distribution. The findings were presented in Table 4.2.

Table 4.2 Test of Normality

Variable	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Mobile Money Subscribers (Millions)	0.141	40	0.043	0.939	40	0.032
Number of Mobile Money Agents (Thousands)	0.143	40	0.038	0.903	40	0.002
Number of Transactions (Millions)	0.108	40	0.200	0.935	40	0.024
Value of Transactions (KSh billions)	0.110	40	0.200	0.936	40	0.025

* This is a lower bound of the true significance.

Source: Researcher (2017)

Since the dataset was less than 2000 elements, the Shapiro-Wilk Test was employed. According to the test results, the significance level for the number of mobile money subscribers, number of mobile money agents, number of mobile money transactions and value of mobile money transactions was 0.032, 0.002, 0.024 and 0.025 respectively which means that the data comes from a normal distribution.

4.4 Pearson's Correlation Analysis

Bivariate correlation shows the association between two factors. It arrays from 1 to -1 where 1 shows a strong positive association and a -1 indicates a strong negative association and a zero shows absence of an association between the two factors. The

closer the association inclines to zero the weaker it becomes. The findings were presented in Table 4.6. The correlation association between the number of mobile money subscribers and deposit bank accounts was strong and positive (0.949) and was statistically significant (0.000). The correlation association between the number of mobile money agents and deposit bank accounts was strong and positive (0.975) and was statistically significant (0.000). The correlation association between the number of mobile money transactions and deposit bank accounts was strong and positive (0.990) and was statistically significant (0.000). The correlation association between the value of mobile money transactions and deposit bank accounts was strong and positive (0.988) and was statistically significant (0.000).

Table 4.3 Pearson's Correlation

Variable		Deposit Bank Accounts	Mobile Money Subscribers	Mobile Money Agents	Transactions (Millions)	Transactions(KSh Billions)
Deposit Bank Accounts (per 1000 adult population)	Pearson Correlation	1				
	Sig. (2-tailed)					
Mobile Money Subscribers (Millions)	Pearson Correlation	0.949	1.000			
	Sig. (2-tailed)	0.000				
Number of Mobile Money Agents	Pearson Correlation	0.975	0.940	1		
	Sig. (2-tailed)	0.000	0.000			
Number of Transactions (Millions)	Pearson Correlation	0.990	0.936	0.984	1	
	Sig. (2-tailed)	0.000	0.000	0.000		
Value of Transactions (KSh billions)	Pearson Correlation	0.988	0.961	0.992	0.992	1
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	

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

Source: Researcher (2017)

4.5 Regression Analysis

4.5.1 Fit of Model

Table 4.7 below displays the fitness of the regression model in enlightening on the factors under study. The study findings show that the independent variables; number of mobile money subscribers, number of mobile money agents, number of mobile money transactions and value of mobile money transactions were satisfactorily explaining deposit bank accounts. This inference is backed by an R square of 0.984. This implies that the predictor variables; number of mobile money subscribers, number of mobile money agents, number of mobile money transactions and value of mobile money transactions are key predictors and can explain 98.4% of the independent variable (financial inclusion).

Table 4.4 Fit of Model

Model	Coefficient
R	0.992
R Square	0.984
Adjusted R Square	0.982
Std. Error of the Estimate	62.47

Source: Researcher (2017)

4.5.2 Analysis of Variance

Analysis of Variance (ANOVA) findings presented on Table 4.8 show that the general model was statistically significant. This was backed by a probability (p) value of 0.000. The described p value was lower than the set conventional probability of 0.05 significance level and thus important in the research. These findings indicate that the predictor variables; number of mobile money subscribers, number of mobile

money agents, number of mobile money transactions and value of mobile money transactions are good predictors of deposit bank accounts (financial inclusion).

Table 4.5 Analysis of Variance

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	8226940	4	2056735	527.029	0.000
Residual	136587.7	35	3902.506		
Total	8363528	39			

Source: Researcher (2017)

4.5.3 Coefficients

Regression of coefficients results were presented in Table 4.9. The findings indicate that there is a positive link amid number of mobile money subscribers, number of mobile money agents, number of mobile money transactions and value of mobile money transactions and the dependent variable (financial inclusion) whose beta coefficients are 7.696, 0.100, 3.069 and 0.298 respectively. The results indicate that; an increase in the number of mobile money subscribers by one unit leads to an increase in deposit bank accounts (financial inclusion) by 7.696 units; an increase in number of mobile money agents by one unit leads to an increase in financial inclusion by 0.100 units; an increase in number of mobile money transactions by one unit leads to an increase in financial inclusion by 3.069 units and an increase in the value of mobile money transactions by one unit leads to an increase in financial inclusion by 0.298 units

The number of mobile money subscribers, number of mobile money agents and value of mobile money transactions were not statistically significant as the have significance levels of 0.133, 0.527 and 0.644 respectively. The conventional

probability significance level is 0.05 which means for a variable to be statistically significant, it has to have a level which is lower than the 0.05 conventional level. These regression findings imply that the three predictor variables; number of mobile money subscribers, number of mobile money agents and value of mobile money transactions were not key predictors of financial inclusion. However the number of mobile money transactions had a significance level of 0.000 which implies that the variable was a key predictor and important determinant of financial inclusion.

Table 4.6 Coefficients

Variable	Unstandardized Coefficients	Std. Error	t	Sig.
(Constant)	42.549	65.218	0.652	0.518
Mobile Money Subscribers (Millions)	7.696	5.008	1.537	0.133
Number of Mobile Money Agents	0.100	0.001	0.639	0.527
Number of Transactions (Millions)	3.069	0.797	3.853	0.000
Value of Transactions (KSh billions)	0.298	0.64	0.466	0.644

Source: Researcher (2017)

The model was as follows:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \mu$$

Where;

Y= Financial Inclusion - Accessibility in terms of the number of deposit bank accounts (per 1000 adult population)

X_1 = Enrollment to mobile money services - number of people who have subscribed for the mobile money services and how it influences inclusion

X_2 = Number of mobile money distribution - number of mobile money agents who exchange mobile money for real cash

X_3 = Influence of user transactions on financial inclusion - number of transactions performed using mobile phones

X_4 = Influence of value of transactions on financial inclusion – Amount of money transacted over the mobile money services and how this affects inclusion

Overall, the regression model is as follows:

Financial Inclusion (Deposit Bank Accounts) = 3.069 Number of Mobile Money Transactions

4.6 Discussion of Findings

From the research findings, 2007 recorded the least number of mobile subscribers as indicated 6.4 million while the year 2017 recording most mobile subscribers to mobile phone as indicated by 38.9. The study also established a positive coefficient of variation between number of mobile money subscribers and financial inclusion as shown by (Beta value = 3.069). The study findings are consistent with those of Mago and Chitokwindo (2014) who in Masvingo Province empirically investigated the influence of mobile banking on financial inclusion in Zimbabwe and found a positive association between value of mobile transactions and financial inclusion in Zimbabwe.

The study results showed that 2007 recorded the least number of mobile agents as indicated 307 thousands while the year 2017 recording most mobile subscribers to mobile phone as indicated by 514.4. The study also established a positive coefficient

of variation between number of mobile money agents and financial inclusion as shown by (Beta value = 0.100). The study results agree with those of Saliu (2015) who evaluated the influence of transfer services incorporated through mobile money affect the socioeconomic status of the mobile money dealers in Kumasi Metropolis, Ghana and found that agency banking through the mobile platform is positively related to financial inclusion.

The research results indicated 2007 recorded the least number of mobile transactions as indicated by 0.02 million while the year 2017 recording most mobile subscribers to mobile phone as indicated by 428.38 million. The study also established a positive coefficent of variation between number of mobile money transactions and financial inclusion as shown by (Beta value = 3.069). Further, regression results indicated that the number of mobile money transaction as a variable was found to be statistically significant. The study findings are consistent with those of Ishengoma (2011) who studied banking via mobile phones system coverage for financial addition in Tanzania in the Coast region at Kibaha district council and found that volumes of transactions via the mobile platform are important determinants of financial inclusion.

From the research findings, 2007 recorded the least value of mobile transactions as indicated by 0.06 million while the year 2017 recording most mobile subscribers to mobile phone as indicated by 900.09 million. The study also established a positive coefficient of variation between value of mobile money transactions and financial inclusion as shown by (Beta value = 0.298). The study findings are consistent with those of Etim (2014) who investigated banking through mobile avenues and mobile money acceptance for financial inclusion and found that he value generated by mobile phone platforms in banking is positively associated to financial inclusion.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The chapter addressed the summary capturing the findings in line with the objectives. A conclusion on the relationship between the study variables was deduced in line with the objectives. Suggestions for recommendations and areas for further studies were then drawn.

5.2 Summary of Findings

The study objective of the study was to establish the effect of mobile banking on financial inclusion in Kenya. The first research question the study sought to answer was: what is the effect of enrollment to mobile money services on financial inclusion in Kenya? Research findings indicated that there was a consistent increase in the number of mobile money subscribers as indicated by the trend line. The correlation results show the association between the number of mobile money subscribers and deposit bank accounts was strong and positive and was statistically significant. Regression outcomes indicate that there is a positive link amid number of mobile money subscribers and the dependent variable (financial inclusion). The results further indicate that an increase in the number of mobile money subscribers by one unit leads to an increase in deposit bank accounts (financial inclusion) by 7.696 units. However, the regression findings show that number of mobile money subscribers were not statistically significant hence not an important determinant of financial inclusion.

The second research question the study sought to answer was: How does mobile money distribution affect financial inclusion in Kenya? Research findings indicated that there was a consistent increase in the number of mobile money agents as indicated by the trend line. The correlation results show the association between the number of mobile money agents and deposit bank accounts was strong and positive and was statistically significant. Regression results show that there is a positive connection amid number of mobile money agents and the dependent variable (financial inclusion). The results further indicate that an increase in the number of mobile money agents by one unit leads to an increase in deposit bank accounts (financial inclusion) by 0.1000 units. However, the regression findings show that number of mobile money agents were not statistically significant hence not an important determinant of financial inclusion.

The third research question the study sought to answer was: What is the effect of user transactions on financial inclusion in Kenya? Research findings indicated that there was a consistent increase in the number of mobile money transactions as indicated by the trend line. The correlation results show the association between the number of mobile money transactions and deposit bank accounts was strong and positive and was statistically significant. Regression outcomes indicate that there is a positive relationship amid number of mobile money transactions and the dependent variable (financial inclusion). The results further indicate that an increase in the number of mobile money transactions by one unit leads to an increase in deposit bank accounts (financial inclusion) by 3.609 units. Regression findings show that number of mobile money transactions were statistically significant hence the variable was critical in determining financial inclusion.

The forth research question the study sought to answer was: How does value of transactions influence financial inclusion in Kenya? Research findings indicated that there was a consistent increase in the value of mobile money transactions as indicated by the trend line. The correlation results show the association between the value of mobile money transactions and deposit bank accounts was strong and positive and was statistically significant. Regression findings show that there is a positive relationship amid value of mobile money transactions and the dependent variable (financial inclusion). The results further indicate that an increase in the value of mobile money transactions by one unit leads to an increase in deposit bank accounts (financial inclusion) by 0.298 units. Regression findings show that the value of mobile money transactions were not statistically significant hence the variable was not critical in determining financial inclusion.

5.3 Conclusions

From the study findings, one can conclude that all independent variables; number of mobile money subscribers, number of mobile money agents, number of mobile money transactions and value of mobile money transactions were satisfactorily explaining deposit bank accounts. It can also be concluded that the number of mobile money transactions is a good predictor of deposit bank accounts (financial inclusion).

It can also be concluded that in getting to know the extent of financial inclusion, it is vital to understand the exposure of populace to formal bank offices in both rural and urban areas. Superior financial inclusion does not by itself suggest better wellbeing and can generally be categorized into two broad groups; one based on the supply side information from the angle of lenders, such as financial institutions and other service

providers. In Africa, population density has been found to be greatly more important for financial inclusion than any other place.

It is noted that the other factors that may have contributed to financial inclusion include income, population, literacy, deposit and credit penetration. Other factors that have growth of mobile banking services in the country is the convenience , Reliability and flexibility of the service towards vast acceptable points and structure of accessibility with no complexity of registration as it is with banks and other financial service providers. This has facilitated acceptability and use of the services amongst various users across ages, gender, educational levels, and income levels which predominantly defines usage patterns in Kenya. Above and beyond, they established that mobile banking increases financial access

5.4 Recommendations

The researcher recommends that mobile regulators to review the existing regulatory structure to come up with clear regulations to all mobile operators. Clarification issues and vagueness are not good for any business and the assurance in the financial systems. By clearly defining the regulations, the environment is more predictable and this will encourage further more investments and competition. On the regulatory hindrances, there is need to include all service providers both in the banking and mobile industry hence the researcher recommends certain level of clear guidelines on the terms of service delivery.

Through the Central Bank of Kenya, the government make a regulatory outline that motivates financial inclusion, by allowing mobile telecommunication to let the money transfer system function to run not necessarily having to go to central bank banking regulations. More energies should be encouraged to let more people to have access to

financial services. In the developed countries, financial institutions are required by law to open an account for anyone who seeks their services.

Motivation on innovative technological financial inclusion should be encouraged and extended to give more value added financial services to the intended users to enhance accessibility of all financial services which lead to better financial inclusion. This is because they are seen to be an effective measure of financial inclusion. The banking sector should also be motivated to accept banking initiatives that are targeted at raising the amount of people with bank accounts.

5.5 Limitations of the Study

The researcher adopted purely secondary data in his study. This data cannot be validated in that it is what has been presented by the banks that engage in mobile banking services to the Central Bank of Kenya. More so, the study depended on information given by mobile banking services to the regulator (CBK). Hence the information could be biased. The researcher had no way of altering the secondary data for any discrepancies or temporary differences.

The study period covered a period of 10 years due to the unavailability of data for the period before 2006. It would hence be necessary to lengthen the present study by supplementing it with studies employing different statistical methodologies and taking into account comparative data. The inclusion of other financial inclusion determinants would also improve the reliability of the conclusions arrived at.

The researcher adopted correlations and regression analysis which are bivariate and multivariate in nature meaning that two or three variables from different data sets are compared at a time. However, this is not realistic because there are almost always

multiple relationships and effects on something in that the variables operate within a bigger context of micro and macro environment.

5.6 Area for Further Study

This study is not exhaustive in nature and context and as such there is need for further research to be undertaken for similar study using a purely different kind of financial innovation like agency, internet banking to assess whether the findings will be consistent or hold true to the ones found in this study. Another research combining mobile banking with other forms of financial innovation can be conducted also to assess if in fact mobile banking has a higher effect or is superior in terms of inclusion.

A study with a bigger context in terms of geographical scope like the East African Region can be conducted using the same variables to assess whether the findings will agree or disagree across the different economies and in addition shed light on formal financial service providers in the entire region clearly bringing out the benefits, challenges, risks etc. that accrue from the same.

This study has been conducted in a Kenyan perspective. However another study can be conducted in a smaller scope e.g. counties, rural or even an urban context just to assess if the findings will be consistent. Its context can also be narrowed to the banking sector so as to assess whether in a specific subsection of the economy will have similar findings or there will be a disparity on the same.

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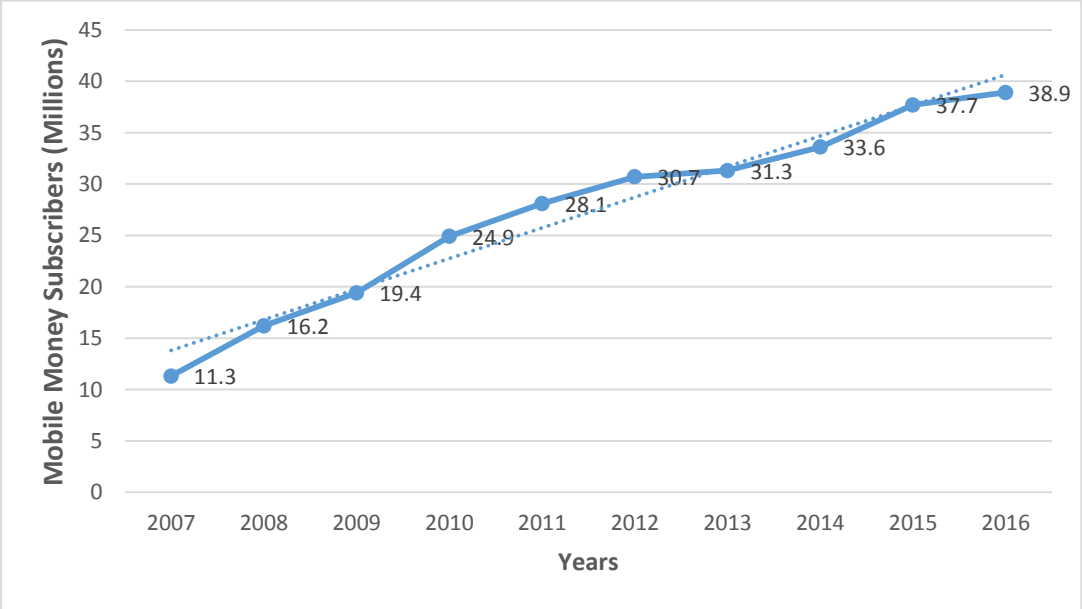
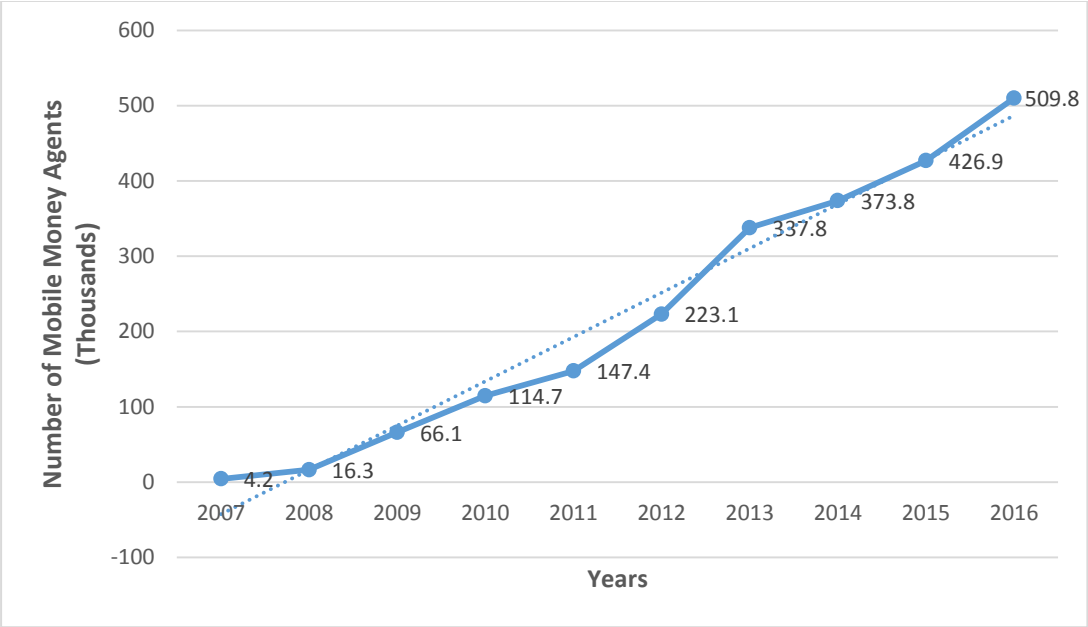
APPENDICES

Appendix I: Trend in the Number of Mobile Money Subscribers



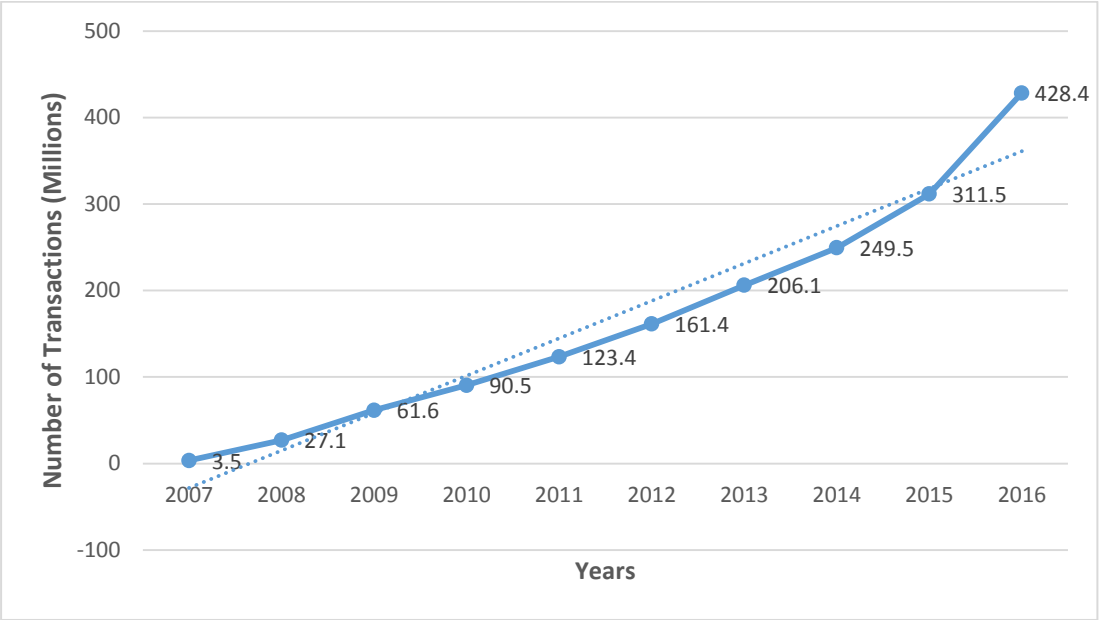
Source: Researcher (2017)

Appendix II: Trend in the Number of Mobile Money Agents



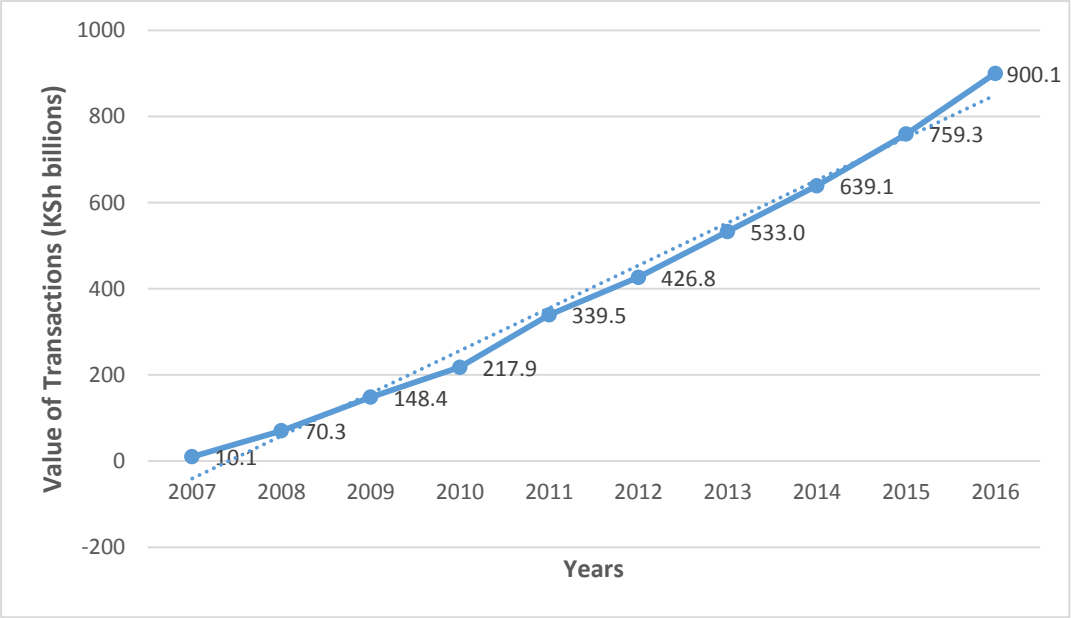
Source: Researcher (2017)

Appendix III: Trend in Number of Mobile Money Transactions



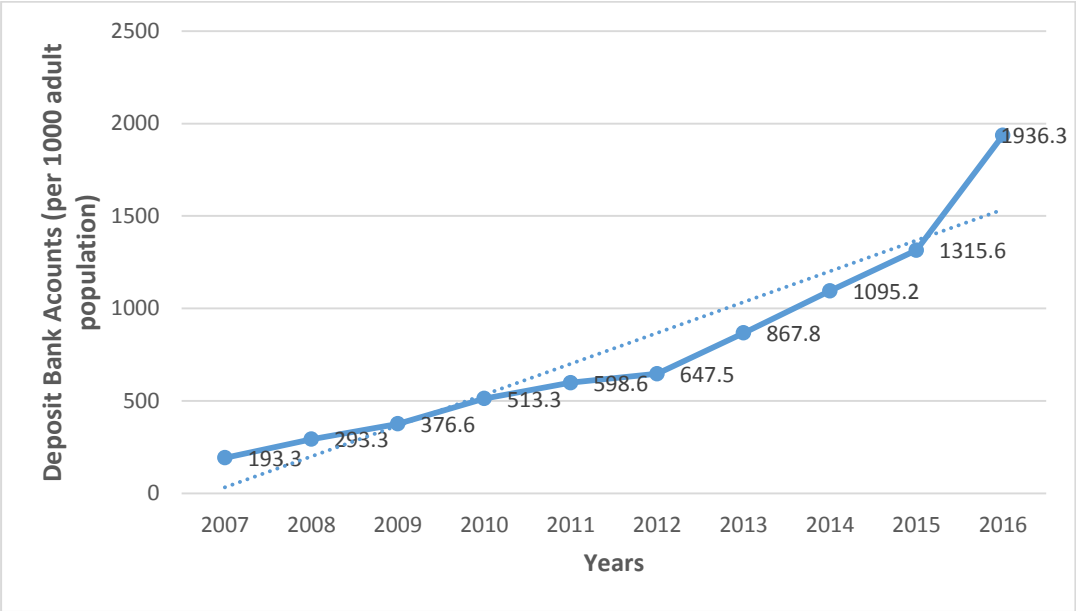
Source: Researcher (2017)

Appendix IV: Trend in Value of Mobile Money Transactions



Source: Researcher (2017)

Appendix V: Trend in Number of Deposit Accounts (Per 1000 Adult Population)



Source: Researcher (2017)

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