

**THE EFFECT OF MOBILE MONEY TRANSFER SERVICES ON  
FINANCIAL DEEPENING IN KENYA**

**BY**

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**D61/75962/2012**

**A RESEARCH PROJECT SUBMITTED FOR EXAMINATION  
IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR  
THE AWARD OF MASTER OF BUSINESS ADMINISTRATION,  
SCHOOL OF BUSINESS, UNIVERSITY OF NAIROBI**

**NOVEMBER 2014**

## DECLARATION

This research project is my original work and has not been presented for examination or award in any other University.

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This research project has been submitted for examination with my approval as the University Supervisor.

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## **DEDICATION**

The research project is dedicated to my ever loving parents and family for their sacrifices, love, prayers and constant encouragement.

## **ACKNOWLEDGEMENT**

Most importantly my greatest gratitude goes to God, for I would not have been able to complete this course without His immense help and guidance. Special appreciation goes to my supervisor Dr. Josiah Aduda for the professional guidance he gave me while doing my research paper. His wise counsel, constructive and innumerable suggestions made this work come to completion.

My gratitude also goes to my lecturers, fellow students for their companion and shared experiences. I will forever be indebted to my loving family for giving up their valuable time to this course. My special thanks to those who knowingly or otherwise had a positive contribution to the successful completion of this research project.

## **ABSTRACT**

Financial deepening is an important development metric globally as one of the factors which can drive widespread economic development by enhancing financial access which increases liquidity in the economy, accelerates the level of economic activity and reduces poverty levels in the country. The introduction of money transfer services in Kenya has seen mobile operators partner with financial institutions to offer wide range of financial products that include payment options, mobile banking, insurance and saving products. However, the effect of mobile money on financial deepening in Kenya remains unknown with no studies have been carried out to evaluate the contribution of various variables to financial deepening in Kenya.

The study sought to determine the effect of mobile money transfer services on financial deepening in Kenya. The study used secondary data obtained from Central Bank of Kenya and Kenya National Bureau of Statistics for the period 2009 to 2013. Descriptive research design was adopted by the study. Multiple regression analysis was used to obtain the relationship between financial deepening and mobile money transfer services. The significance of the results obtained was determined using analysis of the variance. The study found that mobile money transfer services have positive effect on financial deepening in Kenya. The study further found that mobile money transfer services have contributed significantly to deepening financial markets mostly out of financial products related to mobile money developed. Mobile transfer services were also found to have contributed significantly to financial access in Kenya. The study recommended that the Central Bank of Kenya to formulate policies to guide the operations of mobile money services and ensure that mobile operators charge lowest costs, consequently promoting penetration of mobile money services.

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## **LIST OF ABBREVIATIONS**

ATM	:	Automated Teller Machine
CCK	:	Communications Commissions of Kenya
FSD	:	Financial Sector Deepening
IMF	:	International Monetary Fund
MMT	:	Mobile Money Transfer Services



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# CHAPTER ONE

## INTRODUCTION

### 1.1 Background of the Study

Financial deepening refers to the increased provision of financial services with a wider choice of services. It is meant to enhance financial access by availing liquidity to the economy and consequently promoting economic growth (Shaw, 1973). The role of mobile money transfer services to financial deepening in Kenya can be identified with the partnership between financial institutions and mobile phone operators aimed at enhancing payments and mobilizing savings. Safaricom Limited through Mpesa has continued to have the largest money transfer services market share accounting for 70.7% of total number of mobile money service subscribers' outlets (CCK, 2013). In addition, Mpesa is the highest mobile phone banking player due to the partnership with the Commercial Bank of Africa (Mshwari) and tapping into an underdeveloped financial services market. In 2014 Safaricom partnered with Britam and Changamka Micro Health to provide insurance to Kenyans with low income (Linda Jamii).

Financial deepening in developing countries like Kenya is still low as reflected by limited access to financial services by households and enterprises. Formal financial services in less developed, while expanding, are typically limited to small segments of the population (IMF, 2012). In Africa, financial access to formal financial services remains less than 20% (Honohan 2008). The enthusiasm for the achievement of financial access has been ignited by the advent of money transfer services provided over mobile phones and the further potential mobile money technology offers for financial service development (Aker and Mbiti, 2010). Introduced in 2007 by Kenya's leading mobile phone operator Safaricom, by 2012 MPesa has over 15 million

registered users and by 2011, 67% of the adult population reported having received funds through it. The advent of mobile money transfer is hailed as offering a service to save as well as an infrastructure through which these services can more effectively be provided (Johnson, 2012).

In the 2009 study on financial inclusion in Kenya, 59% of the adult population was found to be either completely financially excluded or utilising informal financial methods (FSD, 2009). This low level of financial access confirms that financial deepening is still low in Kenya. There is a growing body of knowledge demonstrating that an increase in access to formal financial services has the potential of moving people out of their poverty trap. Some of the main benefits of moving more of the financially excluded people into the formal grid are to reduce transaction costs, mobilize savings and encourage investments (King, and Levine, 1993)

The lack of access to formal financial services is linked to the persistent income inequality and slow economic growth. It is also argued that the financial services to the poor should be appropriate and affordable in order for them to have the desired effect (Demirguc-Kunt, Beck and Honohan, 2009). Kenya is striving to become a regional financial hub with vibrant, efficient and globally competitive financial systems in line with vision 2030. An increase in access to affordable financial services to all Kenyans, particularly the poor is part and parcel of this development strategy. This therefore implies that low-income households, small business owners, individuals in rural areas and slums are given specific consideration in this strategy (FSD, 2009).

### **1.1.1 Mobile Money Transfer Services**

Use of mobile transfer services in Kenya has continued to grow indicating the willingness of consumers in areas without or with limited banking services to adopt mobile money services as a form of banking. The total number of mobile money transfers increased from KES 672 billion in year 2012 to KES 913 billion in 2013 representing a growth of 35.9%. Similarly, the number of active agents rose from 49,079 during the year 2012 to 88,466 recorded in the year 2013 representing a significant growth of 80.3%. The mobile money transfer service penetration rose from 49.38% cent in the financial year 2012 to 61.50% cent in year 2013. This growth was attributed to the increased mobile cellular telephony penetration, increased mobile money transfer agents and increased value added services such as m-banking, m-insurance among others (CCK, 2013).

The wave of mobile money transfer in Kenya can be traced to introduction of Mpesa (Johnson, 2012) and hence the reason for studying Mpesa in making conclusions on the effect of mobile money transfers service on financial deepening. Mpesa is a mobile money transfer service owned by Safaricom and since its introduction in 2007, it has recorded tremendous success. The success of Mpesa in Kenya compares with significant success in mobile money transfer in Phillipines and more moderate success elsewhere such as South Africa and India (McKay and Pickens, 2010). The factors contributing to Mpesa success in Kenya have been identified as having a favourable regulatory regime in Kenya, the potential for the development of retail agent networks and the nature of the mobile phone network landscape in particular related to coverage, texting, and the dominance of operators (Heyer and Mas, 2011).

Introduction of Mpesa has enabled business to receive payments directly to the their bank accounts and rural recipients to access banking services more easily (Morawczynski, 2009). The adoption of Mpesa has also led to increased frequency of sending transfers but interestingly not to increase the likelihood of receiving them (Mbiti and Weil, 2011). The introduction had significant effects in reducing the effect of negative shocks on consumption compared to those who did not have access to money transfer services (Jack and Suri, 2009). Savings play an integral part in ensuring that the financial access leads to improved incomes, returns and poverty reduction. Based on this argument, introduction of Mpesa was expected to contribute to increased savings among households. However, the likelihood that user will store funds in the Mpesa account remains minimal and with users preferring to withdraw higher amounts in order to economize on fees (Mbiti and Weil, 2011).

### **1.1.2 Financial Deepening**

Financial deepening is a multidimensional process whereby financial institutions and markets provide a range of services and instruments that allow for efficient exchange of goods and services, effective savings and investment decisions, including at long maturities, and the financial sector can create a broad menu of assets for risk sharing purposes (hedging or diversification) (IMF, 2012). It is the ability of financial institutions in an economy to effectively mobilize savings for investment purposes and offer wide variety of financial products meant at enhancing financial access (Valverde, Paso, and Fernandez, 2004). It is also viewed as the process of increasing the efficiency, depth (credit intermediation and market turnover), breadth (range of markets and instruments) and each (access) of financial systems. Financial deepening can confer important benefits for macro-stability and sustained growth while also

creating risks that must be effectively managed (Goyal, Marsh, Narayanan, Wang, and Ahmed, 2011).

Financial deepening vigorously attracts the reservoir of savings and idle funds and allocates same to entrepreneurs, businesses, households and government for investments projects and other purposes with a view of returns which forms the basis for economic growth and development. It also promotes liquidity in the economy which stimulates the level of economic activities and hence economic growth (Torruam, Chiawa, and Abur, 2013).

Financial deepening can be understood as increasing the use and coverage of financial services, both on the savings and the credit side, which requires understanding the needs and characteristics of new consumers, and developing new products and delivery mechanisms. The rapid uptake of mobile financial services in Kenya has demonstrated the potential of reaching the poor using mobile technology and generated enthusiasm across the world about what is possible with these technologies (Omwansa and Waema, 2014).

### **1.1.3 Money Transfer Services and Financial Deepening**

Mobile technology has continued to revolutionize banking and payment systems in Kenya, with the provision of applications that enable diverse financial transactions via the mobile platform. These applications include purchasing airtime, money transfer, paying bills, Automated Teller Machine (ATM) withdrawals and even facilitating mobile banking transactions such as sending or withdrawing money to and from ones' bank account, via the various mobile money transfer platforms offered by the operators. The 'mobile wallet' has enabled money transfer payments to schools,

hospitals and other organizations as well as enabling shopping both online and from local retail (CCK, 2013).

With the rapid uptake of mobile financial services, the prospects are high for evolving into of a “cash-lite” financial system that enables transactions to be carried out at lower costs and at a much higher accessibility level. Some start-up companies have focused on streamlining businesses that originally operated on cash; others provide mobile financial services such as micro-loans, micro-insurance, layaway programs, among others. Hundreds of business have integrated their businesses with mobile money and are able to seamlessly link to bank accounts as entrepreneurs provide integration capabilities. With emerging business models, mobile money can become a strong channel to formalize financial transactions for the poor. The poor, just like anyone else, do not just transfer funds for the sake of it, they transfer for a purpose, such as buying, saving or paying (Omwansa and Waema, 2014).

Mobile money transfer has a number of potential contributions to financial deepening and economic effects as identified by Jack and Suri (2009). First, it simply facilitates trade, making it easier for businesses and people to pay for, and to receive payment for, goods and services. Electricity bills can be paid with using the “pay bill” option instead of travelling to an often distant office with a fistful of cash and waiting in a long queue; consumers can quickly purchase cell phone credit (“airtime”) without moving; and taxi drivers can operate more safely, without carrying large amounts of cash, when they are paid electronically. Second, by providing a safe storage mechanism, mobile money could increase net household savings (Jack and Suri, 2009).



Third, because it facilitates inter-personal transactions, it could improve the allocation of savings across households and businesses by deepening the person-to-person credit market. This could increase the average return to capital, thereby producing a feed-back to the level of saving. Fourth, by making transfers across large distances trivially cheap, mobile money improves the investment in, and allocation of, human capital as well as physical investment. Households may be more likely to send members to high-paying jobs in distant locations, either on a permanent or temporary basis, and to invest in skills that are likely to earn a return in such places but not necessarily at home (Jack and Suri, 2009).

#### **1.1.4 Kenya's Financial Sector**

The financial landscape in Kenya dramatically changed with a significant growth in the formally included rising from 26.3% to 40.5% (FSD, 2009). The more than 10% growth is undoubtedly associated with the uptake of mobile money in the country, particularly MPesa (FSD, 2007). It is also to be noted that while the excluded in urban areas shrank over this period, it hardly changed in the rural areas, suggesting some barriers or inhibitors for diffusion in rural areas.

Kenya's financial sector is relatively well developed with 43 licensed commercial banks, nine Deposit Taking Microfinance Institutions, over 3000 Savings and Credit Cooperatives, 125 foreign exchange bureaus, one mortgage finance company, one Postal Savings Bank and an Association of Microfinance Institutions. The country's banking sector has undergone substantial transformation particularly from the year 2005 since the formation of financial sector deepening. Within three years, the number of deposit accounts went up by 3.9 million, a growth rate estimated at 152%.

Within the same period, the branch network expanded by 60% while the ATM network grew from 323 units to 1,325 (FSD, 2011).

## **1.2 Research Problem**

Financial deepening has become an important development metric globally as one of the factors which can drive widespread economic development (Cracknell, 2012). This is from the knowledge that financial deepening enhances financial access which increases liquidity in the economy, accelerates the level of economic activity and reduces poverty levels in the country. The introduction of money transfer services in Kenya has seen mobile operators partner with financial institutions to offer wide range of financial products that include payment options (like lipa na Mpesa, paybill), insurance (like linda Jamii) and saving products. In addition, mobile money transfer services has promoted mobile phone banking with introduction of bank accounts to all customers with Mpesa via Mshwari (an Mpesa product in partnership with Commercial Bank of Africa) and thereby tapping into an underdeveloped financial services market (Omwansa, and Waema, 2014). Despite these efforts and partnerships between mobile money transfer services and financial institutions, the effect of mobile money on financial deepening in Kenya remains unknown.

Low financial deepening level in a country is associated with lack of access to formal financial services which is linked to the persistent income inequality and slow economic growth. According to financial access survey 2009, 41% of the adult population had access to financial services with 59% being completely financially excluded or utilising informal financial methods (FSD, 2009). The Financial access 2013 survey results reveal that Kenya's financial inclusion landscape has undergone

considerable change with adult population accessing formal financial services being 66.7% in 2013 (FSD, 2013). Could the increased financial access between 2009 and 2013 be as a result of mobile money's role in deepening financial markets? Could it be that the increase in access is out of the banking products and services offered via mobile money transfer?

Few studies have been carried out to evaluate the contribution of various variables to financial deepening in Kenya. Cherotich (2013) studied the role of microfinance institutions in financial deepening in Kenya and found that microfinance institutions contributed significantly to financial deepening. Ng'ang'a (2013) studied the relationship between financial deepening and poverty level in Kenya where the study found that financial deepening had a positive effect on poverty level in Kenya, more specifically as proxies of financial deepening were increased the private per capita consumption consequently increased which is a proxy measure for poverty. Mbiti and Weil (2011) studied mobile banking; the effect of MPesa in Kenya and found that Mpesa provided an alternative for those who could not access banking services. None of these studies have examined the effect of mobile money transfer services to financial deepening.

Therefore, this study bridged the gap that existed in determining the effect of Mobile money transfer services to financial deepening in Kenya. The study sought to answer the question; what is the effect of mobile money transfer services to financial deepening in Kenya?

### **1.3 Objectives of the Study**

The general objective of the study was to determine the effect of mobile money transfer services on financial deepening in Kenya.

The specific objectives were to:

- i. Determine the relationship between mobile money penetration and financial deepening.
- ii. Obtain the effect of growth in amount transferred through mobile money transfer services and financial deepening.

### **1.4 Value of the Study**

The research findings are of significance to various parties who include the government, mobile companies' management, mobile money users and general public and researchers and academicians. The study can assist the government in formulating macroeconomic policies that can promote financial deepening and enrich mobile money transfer services so as to reach more citizens.

To mobile companies' management, the study findings have demonstrated the contribution of mobile money services to financial deepening in Kenya and suggest ways of further improving the services offered. By management adopting the study findings, they will be able to reach more customers which in return will increase their profitability. To the mobile money users and the general public, adoption of findings by the government and mobile companies' will lead to improved mobile money services and stream lining of mobile money process which will benefit the public and the users.

To the researchers and academicians the study has provided strong empirical evidence on the ongoing debates on mobile money services and the contribution to financial deepening. It has bridged the gap that exists in literature on the role of mobile money services on financial deepening and form a basis of future research.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter reviews existing literature on financial deepening and mobile money services. This involves review of theoretical aspects related to the study, empirical studies that relate to financial deepening and mobile money transfer services.

#### **2.2 Theoretical Review**

There various theories that guided the study which include financial repression theory, Schumpeterian theory and Keynesian theory.

##### **2.2.1 Financial Repression Theory**

The theory was proposed by McKinnon (1973) and generally supports the role of deepening of financial markets. McKinnon (1973) defined financial repression as government financial policies strictly regulating interest rates, setting high reserve requirement on bank deposits, and compulsory allocating resources. Such repressive policies, commonly observed in many developing countries, would impede financial deepening and hinder efficiency of the financial system.

The theory argues that freeing of domestic capital markets from usury laws and other alleged government induced distortions facilitates financial deepening. Mackinnon (1973) views domestic financial sectors as being characterized by widespread bankruptcies, massive government interventions or nationalizations of private institutions, and low domestic savings, all that lead to financial repression and hinders financial deepening. According to financial repression theory, poorly functioning

financial systems in developing countries affect negatively quality and growth rate of the economy.

In relation to mobile money and financial deepening, the success of mobile money and its increased role in financial deepening is due to the less regulated environment in which mobile money services operates. Johson (2012) attributes the success in penetration by Mpesa to the less regulation environment of in which Mpesa was launched and has operated since 2007 which is in line with financial repression theory. However, the critics of the theory blame financial crisis on lack of proper regulations in the financial sector.

### **2.2.2 Schumpeterian Theory**

The theory was propounded by Schumpeter (1911) who argued that a well developed financial sector should help allocate financial resources to the most productive and efficient use. Thus services provided by the financial intermediaries would be important for promoting production and innovation. The theory supports innovations in the financial markets as they are meant to come up with better products and services which will ensure financial access to more people. In relation to this study, mobile money is viewed as a part of financial market innovations and hence contributes to financial deepening.

### **2.2.3 Keynesian Theory**

The theory was proposed by Keynes (1936). According to the theory, any forms of financial deepening and intermediation are engaged in reconciling the long term needs of borrowers with the short term needs of lenders. This process of liquidity transformation applies to all financial transactions where securities are exchanged for

money. Liquidity transformation is an unavoidable characteristic of a monetary economy with financial markets. But, as Keynes (1936) pointed out, liquidity transformation in organised financial markets, although the best of possible options, raises some difficulties. Banks and financial markets are therefore all unavoidably engaged in liquidity transformation. But, of course, in a situation where loss of confidence strikes, the liquidity of financial markets evaporates under a wave of sell orders.

In relation to mobile money and financial deepening, the effect of any measures towards deepening financial markets depends on confidence level of the investors and users. Therefore, for mobile money to have effect on financial deepening in Kenya, users must have trust in the mobile transfer services. Omwansa and Waema (2014) found that trust is very critical in determining what mobile money services consumers get to adopt and mobile service providers must overcome distrust among users. Trust is measure of consumers' level of assurance that the service will be provided with minimum possible hindrance. Trust is a psychological expectation that a trusted party will not behave opportunistically (Siau and Shen, 2003).

### **2.3 Determinants of Financial Deepening**

There are various variables identified as important determinants of financial deepening. These include mobile money transfer, financial sector regulation and technological levels in the country.



### **2.3.1 Financial Sector Regulation**

This is a neoclassical models suggest that financial regulation brings major benefits, such as, sharing risks among the investors, and capital flowing towards highly productive sectors. Financial sector deregulation leads to financial sector development but may be also associated with greater risks, including exposure to external shocks and foreign competition. This may encourage the development of financial markets that can be used to diversify such risks, and that allow firms to overcome short-term cash flow problems or adverse shocks. The cross-country study of Levine and Zervos (1996) identified a robust correlation between openness and the share of investment in GDP and showed that, if trading economies have also high investment, this could promote financial development. While more open financial markets can contribute to economic development, it is the openness of financial markets that can make developing countries more vulnerable to financial disruptions.

### **2.3.2 Technological Level**

Technological advancements in the financial sector enhance financial deepening in a country. Through technological advancements, financial institutions are able to offer more products and enhance financial access. Online banking and agency banking are examples of technological advancements and are meant enable customers to access information relating to their accounts. Subsequent innovations have seen the mobile banking phenomena continue to grow steadily. While the fees charged for transactions via mobile banking and online banking are largely below those levied by traditional banks for similar services, the prices are expected to decline further over time as competition intensifies. Technological advancements are capable of promoting sustained financial deepening development (Cracknell, 2012).

### **2.3.3 Mobile Money Transfer**

Mobile money transfer services have enabled more adults to access banks accounts, online banking and offering of more financial products by commercial banks. This is through products like Mshwari and insurance products like Changamka Micro Health and Linda Jamii. Banks could be accessed through the mobile phone and later mobile transfer facilities like M-pesa came up (CCK, 2013). The Central Bank of Kenya has in the recent years introduced several regulatory interventions aimed at increasing financial inclusion. Mobile operators and financial institutions have successfully launched numerous services either to increase the convenience for existing customers or to reach out to new customers. There is evidence of more un-banked people moving into the formal financial grid and money initially circulating in informal systems can now be accounted for. Mobile money has made it much easier to receive and transfer money as well as make payments. Agency banking and cash merchants have taken the cash-in-cash-out points much closer to the consumers (Omwansa & Waema, 2014).

## **2.4 Empirical Review**

Mbiti and Weil (2011) studied the effect of Mpesa in Kenya's mobile banking. The study found that while Mpesa had been touted for banking the "unbanked", the study did not find direct effect of M-Pesa on people adopting bank accounts. Further, analyzing data from two waves of individual data on financial access in Kenya, the study found that increased use Mpesa lowered the propensity of people to use informal savings mechanisms but raised the probability of them being banked. Little evidence was found that people used their Mpesa accounts as a place to store wealth.

The results suggested that Mpesa improved individual outcomes by promoting banking and increasing transfers.

Morawczynski and Pickens (2009) carried out a study on “Poor People Using Mobile Financial Services: Observations on Customer Usage and Effect from Mpesa” The study found that Mpesa had changed the patterns of remittances in Kenya. The study results suggested that Mpesa was serving as a partial substitute for the formal banking system. Morawczynski and Pickens (2009) found ethnographic evidence that Mpesa had changed the savings behaviour, the pattern of remittances, and has increased rural livelihoods. The study notes that prior to the introduction of Mpesa, most Kenyans were excluded from modern financial services.

Johnson (2012) studied the competing visions of inclusion in Kenya’s financial landscape and found that 72% of the total sample had used the mobile money transfer service and quoted lower cost, convenience, instantaneous nature, fee payment on withdrawal and extensive agent network as the advantages of using money transfer services. On looking at data on the last transactions, it suggested a strong pattern of receipts from family, household and ‘other’ relatives (67%) with almost half of these from ‘other’ relatives. The pattern of sending was more strongly towards family and ‘other relatives’ (53%) than household members (18%) and these patterns are consistent between the rural and town sites despite the different proportions actually sending. While the majority of qualitatively reported mobile money transactions involved gifts rather than loans, it was clear that mobile money was also expediting inter-personal borrowing. The study concluded that mobile money transfer had allowed relationships of exchange between equals to occur much more cheaply and efficiently, even extending the potential for social connections and negotiability to be developed through such means so offering new routes to resource access.

Omwansa and Waema (2014) studied the deepening financial inclusion through collaboration to create innovative and appropriate financial products for the poor in Kenya. The study found that mobile money as a channel provides the reliability, convenience and flexibility needed by the poor, but fails to provide a structure to instil discipline and the transaction costs particularly for low value transactions are still high. The study also found that the advent of mobile money has led to consistent focus on developing innovative solutions that ride on the rails of mobile money to provide more sophisticated financial services such as savings, credit and insurance, among others. The study also made an observation that the challenge of incurring transactions costs effect is high for low value transfers among users. The study attributes the continued use of Mpesa despite high costs to the fact that when low income earners have no alternative formal financial tools, and hence they are forced to pay for what is available.

Torruam et al. (2013) studied financial deepening and economic growth in Nigeria and found a causal unidirectional relationship between financial deepening and economic growth. The study concludes that financial deepening has an effect on economic growth in Nigeria. The study concludes that developing the financial sector, improves financial structures and ensures efficient delivery of financial services to the private sector to invest to attract more private sector participation for increase output. The study recommends that policy makers to design the policies which will promote the financial and capital markets by removing obstacles that impede their growth and strengthen for healthy and competitive financial system.

King and Levine (1993) established the growth and financial deepening by introducing four measures for the development level of financial intermediaries, which may measure the functioning of the financial system more precisely, averaged over the period 1960-1989. These measures included; Depth that is the liquid liabilities of the financial system [(currency plus demand and interest bearing liabilities of banks and nonbanks)/GDP]; Bank which is the importance of the role of banks (relative to the central bank) for allocating credit, (bank credit / (bank credit + central bank domestic assets); Private ratio of credit allocation to private business to total domestic credit (excluding credit to banks); Privy ratio of credit to private business to GDP.

King and Levine (1993) found statistically and economically significant coefficients of financial development in all 12 regressions and confirmed a very strong relationship between each of the four financial deepening indicators and growth. The study concluded that financial deepening have a large effect on growth rate. In order to investigate whether growth results from financial development, they also considered how well the degree of financial depth in 1960 is correlated with the three growth indicators averaged over 1960 -1989. Their regressions suggested that the initial level of financial deepening could predict well the subsequent rates of economic growth, capital accumulation and productivity growth, even after controlling for important core factors of economic growth.

Cherotich (2013) studied role of microfinance institutions in financial deepening in Kenya. The study established that microfinance institutions promotes financial deepening in Kenya specially because they have contributed to steady increase in the number of depositors; thus showing that more people have access to financial services. The study further established that gross loan portfolio; number of active

borrowers and the returns on assets directly affects financial deepening. The study recommends that policymakers to come up with policies that promote the operations of microfinance institutions like regular and mandatory reporting of performance and laws that govern deposit taking microfinance institutions.

## **2.5 Summary of Literature Review**

A developed financial system broadens access to funds, conversely, in an undeveloped financial system, access to funds is limited and people are constrained by the availability of their own funds and have to resort to high cost informal sources such as money lenders. One of the key features of financial deepening from the literature is that it accelerates economic growth through the expansion of access to those who do not have finance themselves. It is this availability of external finance to budding entrepreneurs and small firms that enable new entry, while also providing competition to incumbents and consequently encourage entrepreneurship and productivity.

Despite various studies on the relationship between finance deepening and economic growth, very limited research has been done on the relationship contributors of financial deepening in Kenya. In addition, many of previous studies on financial deepening from the literature review suffer from limitation of relying on cross-sectional data which cannot satisfactorily address the country specific issues. The problem of using a cross-sectional method is that grouping together countries that are at different stages of financial deepening and growth fails to address the country specific contributors to financial deepening.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter discusses the procedures which were followed in conducting the study. The chapter contains the research design, population of the study, sources and type of data, sampling design, data collection and data analysis.

#### **3.2 Research Design**

The study adopted a descriptive research design which determines and reports the way things are (Mugenda and Mugenda, 2003). Creswell (2003) observes that a descriptive research design is used when data are collected to describe persons, organizations, settings or phenomena. The design also has enough provision for protection of bias and maximized reliability (Kothari, 2008).

#### **3.3 Population**

Population refers to an entire group of individual or objects having common observable characteristic. It should be ensured that population selected is representative and that everyone has an equal chance to be included in the final sample that is drawn according to (Mugenda and Mugenda, 2003). The study population consisted of all mobile money transfer services in Kenya. These include Mpesa (Safaricom), Orange money (Telkom Kenya), Airtel money (Airtel Networks) and Yu cash (Essar Telcom) (CCK, 2013).

### **3.4 Sample Frame**

The sampling frame describes the list of all population units from which the sample will be selected (Cooper & Schindler, 2011). The study adopted a census survey where all mobile money services were studied. The studied mobile money services were Mpesa, Orange money, Airtel money and Yu cash. Mpesa accounts for over 70% of the mobile money transfer services market (CCK, 2013).

### **3.5 Data Collection**

The study relied on secondary data which was obtained from the central bank, Communication Commission of Kenya, Kenya National Bureau of Statistics, Financial Sector Deepening and other publications. Other publications with relevant data on financial access, financial deepening and mobile money transfer services were also used. The study obtained monthly data over 5 years period between years 2009 to 2013, which was analysed to answer the research questions.

#### **3.5.1 Data Validity and Reliability**

Validity refers to the appropriateness, meaningfulness and usefulness of the specific inferences researchers make based on the data collected. Reliability measures the level to which the research instruments yield consistent results or data after repeated trials. Validity determines the relevance of the data in achieving the research objectives. Since the study will use secondary data, the reliability of the data will be determined by comparing the data provided by firms to that available from secondary sources (Kothari, 2008).



### **3.6 Data Analysis**

A descriptive analysis was employed to analyse data. This included the use of table, charts, graphs, percentages and frequencies. Multiple regressions were used to analyse the quantitative data which was analysed using the Statistical Package for Social Sciences (SPSS) version 21. Tables, charts and figures were used to present the data collected for ease of understanding and analysis.

#### **3.6.1 Analytical Model**

Multiple regressions method was used to analyse data and examine the relationship of dependent and independent variables. The model applied was related to that used by Cherotich (2013) and improved by that used by Cracknell (2012). Cherotich (2013) argue that financial deepening has an effect of enhancing financial access and hence used to measure level of financial deepening in the country.

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

Where;

Y is the level of financial deepening in Kenya as measured by growth in financial access level in Kenya

X<sub>1</sub> is the mobile money penetration as measured by growth in the number of mobile money transfer clients

X<sub>2</sub> is the growth in monthly amount transferred using mobile money transfer services

X<sub>3</sub> is the growth in number of bank accounts opened via mobile money platforms

X<sub>4</sub> is the growth in number of mobile money financial products offered by financial institutions

$\varepsilon$  is the error term

$\beta_j$  Hypothesized coefficients of independent variables

### **3.6.2 Test of Significance**

The model significance was tested using the analysis of the variance (ANOVA), t-tests, z-tests, F-tests and the chi-square at 95% confidence. Statistical inference techniques were used in making conclusions relating to the accuracy of the model. Coefficient of correlation and determination was used to show the strength of independent and dependent variables and the level of error in the model respectively.

## **CHAPTER FOUR**

### **DATA ANALYSIS AND INTERPRETATIONS**

#### **4.1 Introduction**

The chapter presents the findings and results obtained. The chapter contains detailed research findings and an in depth discussion on the research findings. The research findings are presented using tables, figures and percentages. As discussed in chapter three, data was collected from secondary sources which included the records at Central Bank of Kenya (CBK) and Kenya National Bureau of Statistics (KNBS). The data collected was checked thoroughly to ensure accuracy and completeness.

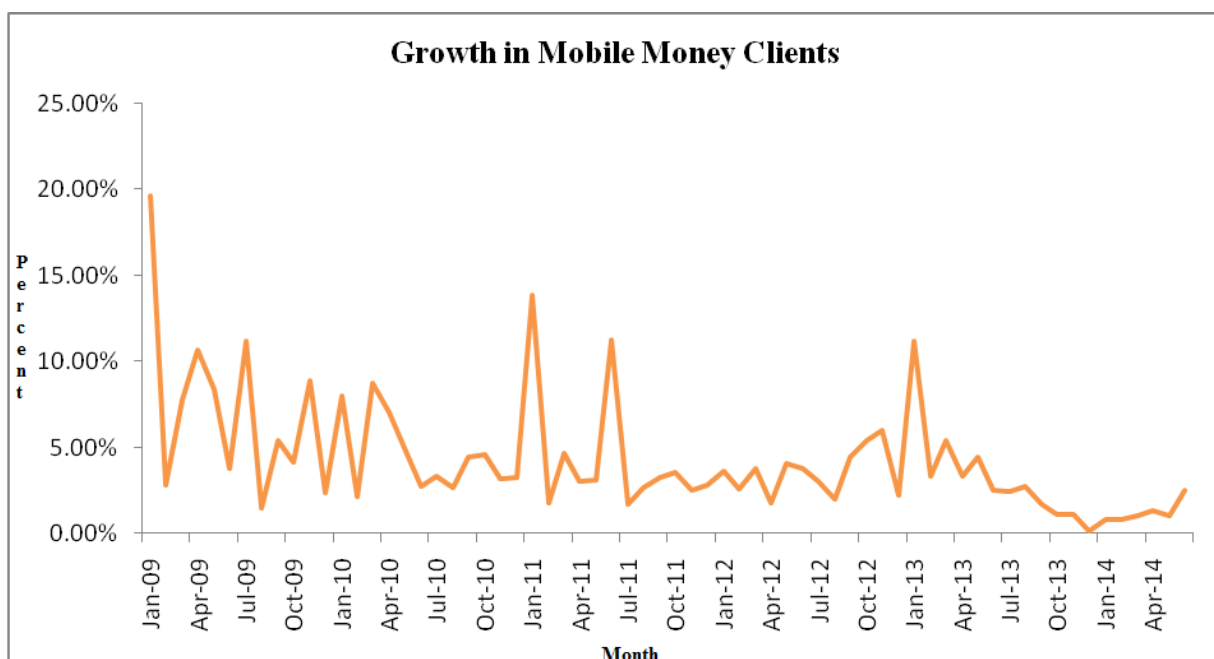
#### **4.2 Findings**

The main purpose of this study was to determine the effect of mobile money transfer services on financial deepening in Kenya. The researcher managed to collect data on 100% of the required data.

##### **4.2.1 Growth in Mobile Money Transfer Services in Kenya**

As shown in figure 4.1 below, mobile money transfer services has continued to experience positive growth over the study period. This can be attributed to mobile money services providing banking services to the unbanked besides creating employment to thousands of Kenyans. This growth was attributed to the increased mobile cellular telephony penetration, increased mobile money transfer agents and increased value added services such as m-banking, m-insurance among others (CCK, 2013).

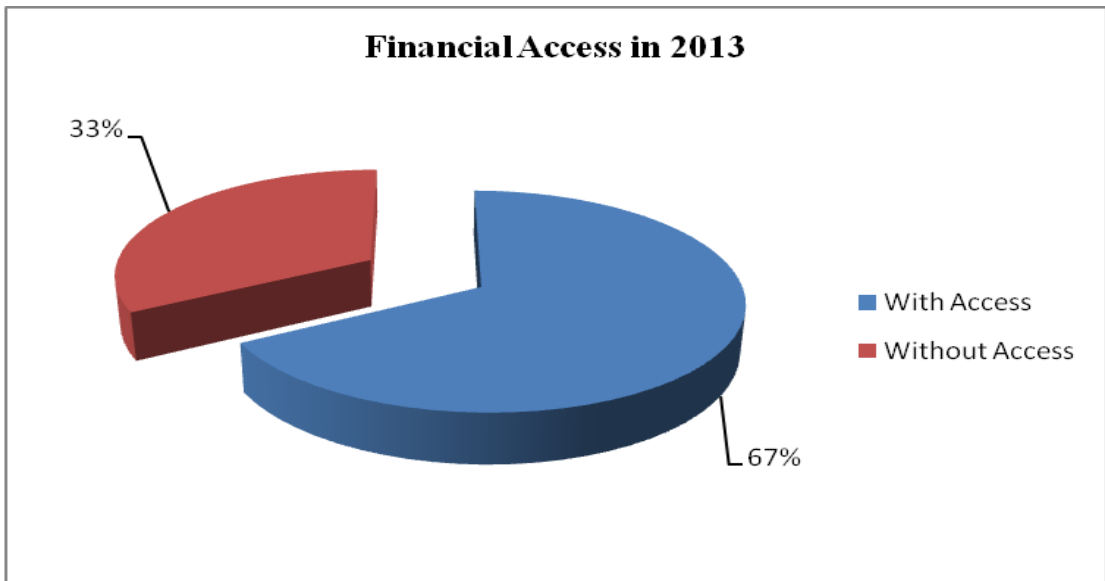
**Figure 4.1: Growth in Mobile Money Clients**



#### **4.2.2 Financial Deepening in Kenya**

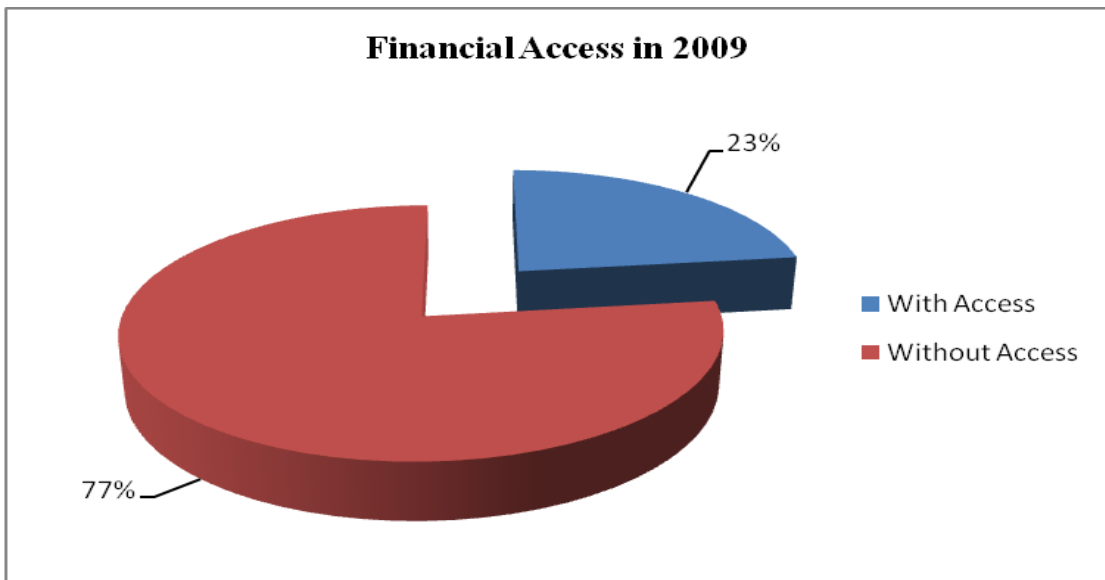
In this study, financial deepening was measured by the percentage of the population with financial access as reported by financial access survey by financial sector deepening (FSD). As it can be seen in Figure 4.2 below, the population with financial access as at 2013 was 67% of the adult population with 33% not having access to any form of finance.

**Figure 4.2: Financial Access Level in 2013**



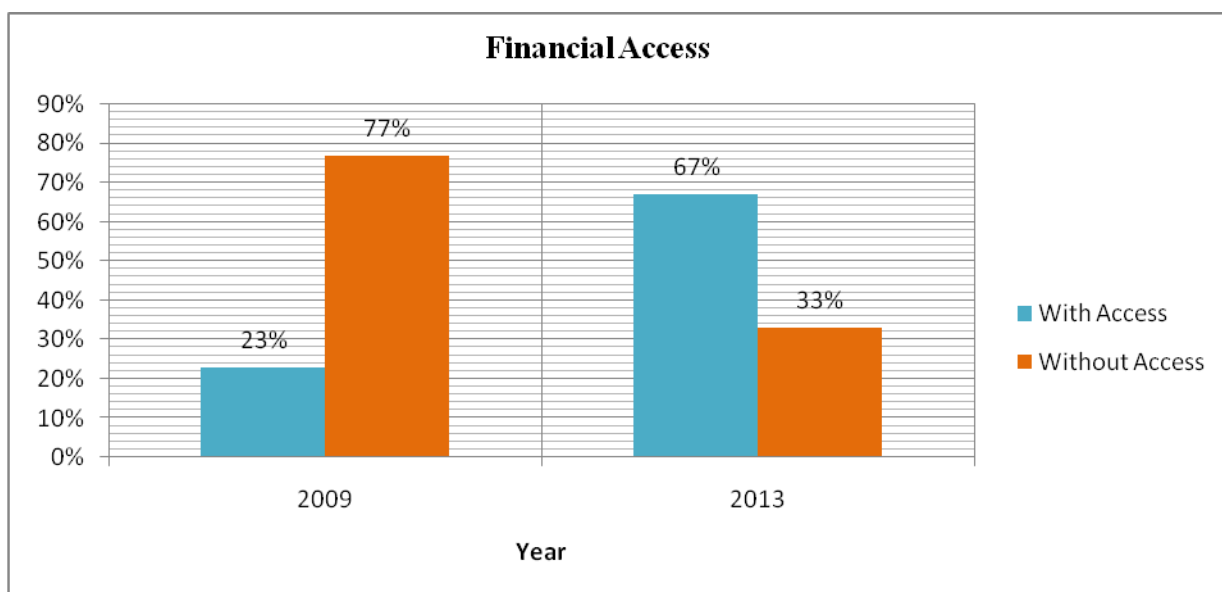
In 2009, financial access was at 23% of adult population with 77% of the population not having financial access. The details are shown in figure 4.3 below.

**Figure 4.3: Financial Access in 2009**



As shown in Figure 4.4 below, financial access improved from 23% in 2009 to 67% in 2013 representing a 191.3% increase in financial access. This implies that financial sector depth improved from year 2009 to 2013. Financial access surveys are conducted every five years.

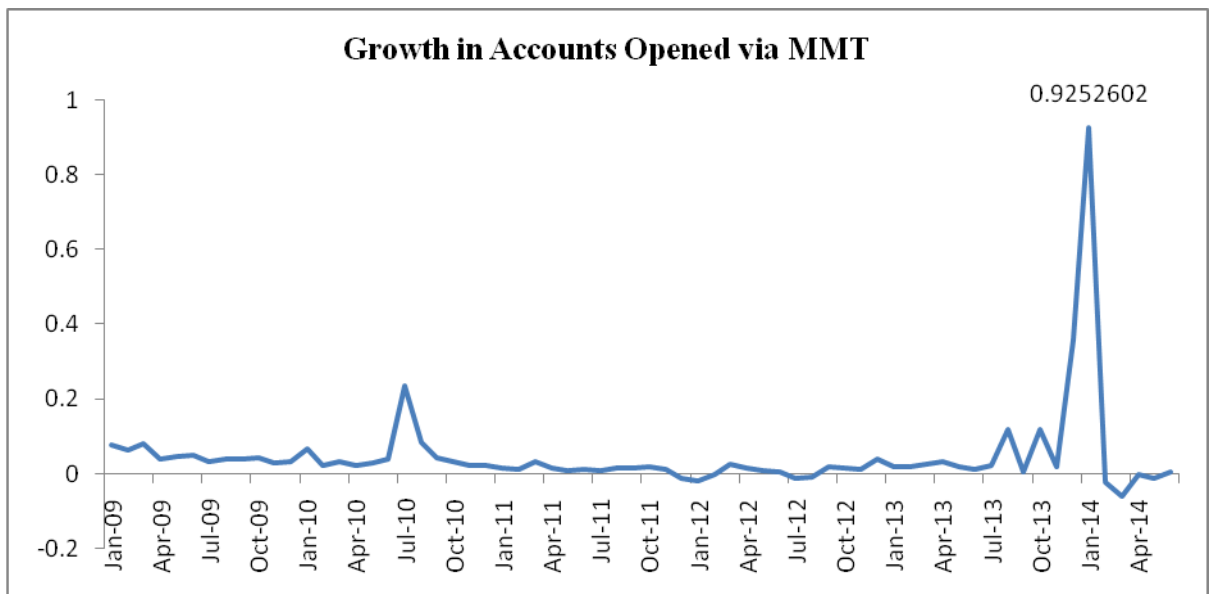
**Figure 4.4: Financial Access in 2013 and 2009**



#### **4.2.3 Growth in Bank Accounts Opened Through Mobile Money Services**

The accounts opened through mobile money transfer platform continued to grow month from month with the highest growth being in December 2013 where the accounts growth by 93%. This could be attributed to success of Mshwari where Commercial Banks of Africa recorded 800% growth in bank accounts in 2013 compared to 2012. The growth in accounts opened through mobile money platforms is shown in figure 4.5 below.

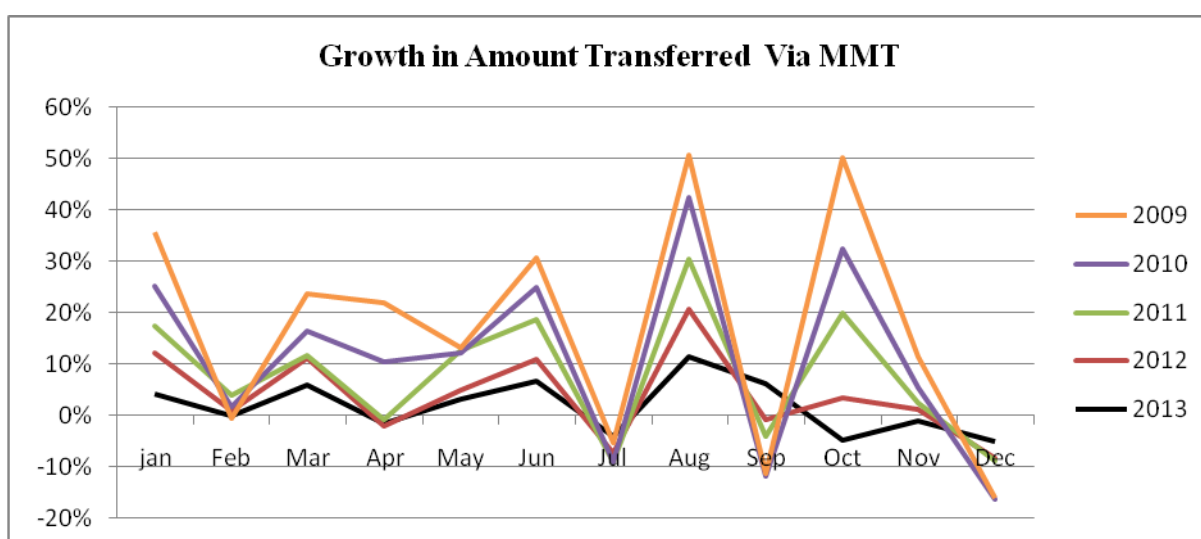
**Figure 4.5: Growth in Bank Accounts Opened Through Mobile Money Services**



#### **4.2.4 Growth in Amount Transferred Through Mobile Money Services**

As shown in figure 4.6 below, amount transferred through mobile money transfer services continued to grow at higher rate from year 2009 with the rate of growth continuing to reduce in year 2010, 2011, 2012 and 2013. Amount transferred through mobile money platform was found to reduce in all years in the months of February, July, September and December. The amount was highest in the months of August and October in all the years.

**Figure 4.6: Growth in Amount Transferred Through Mobile Money Services**



### 4.3 Regression Analysis

The relationship between dependent and independent variables was obtained by regression analysis using SPSS.

#### 4.3.1 Regression on Financial Deepening and Mobile Money Transfer Services

Regression analysis between financial deepening and mobile money transfer services is positive with a coefficient of correlation of 0.62 and coefficient of determination of 0.39. The model details are shown in table 4.1 below.

**Table 4.1: Financial Deepening and Mobile Money Model Summary**

Model	R Square	Adjusted R Square	Std. Error of the Estimate
0.6279	0.3943	0.0401	0.1974

a. Predictors: (Constant), Mobile Money Transfer Services



The model ANOVA details are shown in table 4.2 below. The p value of 0.0031 implies that the model is significant at 95% confidence level since the value is less than 0.005.

**Table 4.2: Financial Deepening and Mobile Money Model ANOVA**

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	0.0415	1	0.04146	1.0643	0.0031
Residual	2.4929	64	0.03895		
Total	2.5344	65			

a. Predictors: (Constant), Mobile Money Transfer Services

b. Dependent Variable: Financial Deepening

The model coefficients are shown in table 4.3. The model coefficients are significant since the p value of 0.0000 and 0.0031 are less than 0.05. The model developed is  $Y=0.3252+0.7198X_1$  where Y is financial deepening level as shown by number of adults with access to finance and X1 is the growth in mobile money transfer services.

**Table 4.3: Financial Deepening and Mobile Money Model Coefficients**

	Unstandardized Coefficients	Std. Error	Standardized Coefficients	t	Sig.
(Constant)	0.3252	0.0341		9.5250	0.0000
MMT	0.7198	0.6977	0.1279	1.0317	0.0031

### 4.3.2 Regression on Financial Deepening and Mobile Money Penetration

Regression analysis between financial deepening and growth in mobile money transfer clients is positive with a coefficient of correlation of 0.30 and coefficient of determination of 0.09. The model details are shown in table 4.4 below.

**Table 4.4: Financial Deepening and Growth in MMT clients Model Summary**

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.30367	0.0922	0.07803	0.18960

a. Predictors: (Constant), Growth in Number of MMT clients

The model ANOVA details are shown in table 4.5 below. The p value of 0.0132 implies that the model is significant at 95% confidence level since the value is less than 0.005.

**Table 4.5: Financial Deepening and MMT Client Growth ANOVA**

	Sum of Squares	df	Mean Square	F	Sig.
Regression	0.23371	1	0.2337	6.5014	0.0132
Residual	2.30069	64	0.0359		
Total	2.53440	65			

a. Predictors: (Constant), Growth in Number of MMT clients

b. Dependent Variable: Financial Deepening

The model coefficients are shown in table 4.6. The model coefficients are significant since the p value of 0.0000 and 0.0132 are less than 0.05. The model developed is  $Y=0.4244+1.7115X_2$  where Y is financial deepening level as shown by number of adults with access to finance and X1 is mobile money services as measured by the growth in number of mobile money transfer services clients.

**Table 4.6: Financial Deepening and MMT Client Growth Model Coefficients**

	Unstandardized Coefficients	Std. Error	Standardized Coefficients	t	Sig.
(Constant)	0.4244	0.0374		11.3567	0.0000
Growth MMT clients	1.7115	0.6712	0.3037	-2.5498	0.0132

a. Dependent Variable: Financial Deepening

### 4.3.3 Regression on Financial Deepening and Growth in Amount Transferred Through Mobile Money Transfer Services

Regression analysis between financial deepening and growth in amount transferred through mobile money transfer is positive with a coefficient of correlation of 0.18 and coefficient of determination of 0.03. The model details are shown in table 4.7 below.

**Table 4.7: Financial Deepening and Growth in Amount Transferred through MMT Model Summary**

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.18048	0.03257	0.01746	0.01957

a. Predictors: (Constant), Amount transferred

The model ANOVA details are shown in table 4.8 below. The p value of 0.0147 implies that the model is significant at 95% confidence level since the value is less than 0.005.

**Table 4.8: Financial Deepening and Growth in Amount Transferred through MMT ANOVA**

	Sum Squares	of df	Mean Square	F	Sig.
Regression	0.0826	1	0.0826	2.1548	0.0147
Residual	2.4518	64	0.0383		
Total	2.5344	65			

a. Predictors: (Constant), Amount transferred

b. Dependent Variable: Financial Deepening

The model coefficients are shown in table 4.9. The model coefficients are significant since the p value of 0.0000 and 0.014 are less than 0.05.

**Table 4.9: Financial Deepening and Growth in Amount Transferred through MMT Coefficients**

	Unstandardized Coefficients	Std. Error	Standardized Coefficients	t	Sig.
(Constant)	0.3693	0.0274		13.4590	0.0000
Amount transferred	-0.6093	0.4151	-0.1805	-1.4679	0.0147

a. Dependent Variable: Financial Deepening

#### 4.3.4 Regression on Financial Deepening and Growth in Accounts Opened Through Mobile Money Transfer Services

Regression analysis between financial deepening and growth in accounts opened through mobile money transfer is positive with a coefficient of correlation of 0.21 and coefficient of determination of 0.04. The model details are shown in table 4.10 below.

**Table 4.10: Financial Deepening and Growth in Accounts Opened Through MMT Model Summary**

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.2105	0.0443	0.0294	0.1945

a. Predictors: (Constant), Bank Accounts Opened

The model ANOVA details are shown in table 4.11 below. The p value of 0.0898 implies that the model is not significant at 95% confidence level since the value is higher than 0.05.

**Table 4.11: Financial Deepening and Growth in Accounts Opened Through MMT Model ANOVA**

	Sum of Squares	df	Mean Square	F	Sig.
Regression	0.1123	1	0.1123	2.9662	0.0898
Residual	2.4221	64	0.0378		
Total	2.5344	65			

a. Predictors: (Constant), Bank Accounts Opened

b. Dependent Variable: Financial deepening

The model coefficients are shown in table 4.12 below.

**Table 4.12: Financial Deepening and Growth in Accounts Opened Through MMT Model Coefficients**

Model	Unstandardized Coefficients	Std. Error	Standardized Coefficients	t	Sig.
(Constant)	0.3344	0.0256		13.0549	0.0000
Bank Accounts Opened	0.3366	0.1954	0.2105	1.7223	0.0898

a. Dependent Variable: Financial Deepening

#### **4.3.5 Regression on Financial Deepening and Growth in Mobile Money Transfer Services Related Products**

Regression analysis between financial deepening and growth in mobile money transfer new products is positive with a coefficient of correlation of 0.82 and coefficient of determination of 0.67. The model details are shown in table 4.13 below.

**Table 4.13: Financial Deepening and New MMT Model Coefficients**

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.8225	0.6766	0.6715	0.1132

a. Predictors: (Constant), New products

The model ANOVA details are shown in table 4.14 below. The p value of 0.0000 implies that the model is significant at 95% confidence level since the value is less than 0.005.

**Table 4.14: Financial Deepening and Mobile Money Related Products Model ANOVA**

	Sum of Squares	df	Mean Square	F	Sig.
Regression	1.7147	1	1.7147	133.8680	0.0000
Residual	0.8197	64	0.0128		
Total	2.5344	65			

a. Predictors: (Constant), New products

b. Dependent Variable: Financial deepening

The model coefficients are shown in table 4.15 below. The model coefficients are significant since the p value of 0.0000 is less than 0.05. The model developed is  $Y = -0.2023 + 0.1125X_4$  where Y is financial deepening level as shown by number of adults with access to finance and  $X_4$  is the mobile money transfer services related products like Mshwari.

**Table 4.15: Financial Deepening and Mobile Money Related Products Coefficients**

Model	Unstandardized Coefficients	Std. Error	Standardized Coefficients	t	Sig.
(Constant)	-0.20232	0.04973		-4.06857	0.00013
MMT Products	0.11251	0.00972	0.82253	11.57013	0.00000

a. Dependent Variable: Financial Deepening

### 4.3.5 Overall Multiple Regression

Financial deepening has positive relationship with the mobile money transfer services. This is shown by a coefficient of correlation of 0.8458 and coefficient of determination of 0.7154. The model details are shown in table 4.16 below.

**4.16: Overall model coefficients**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.8458	0.7154	0.6968	0.1087

Predictors: (Constant), Growth in MMT clients, amount transferred, accounts opened and number of MMT related products

The model ANOVA details are shown in table 4.17 below. The p value of 0.0000 implies that the model is significant at 95% confidence level since the value is less than 0.005.

**Table 4.17: Overall Model ANOVA**

	Sum of Squares	df	Mean Square	F	Sig.
Regression	1.8132	4	0.4533	38.3373	0.0000
Residual	0.7212	61	0.0118		
Total	2.5344	65			

a. Predictors: (Constant), Growth in MMT clients, amount transferred, accounts opened and number of MMT related products

b. Dependent Variable: Financial Deepening



The model coefficients are shown in table 4.18. The model coefficients are significant since the p values are less than 0.05. The model developed is  $Y = -0.1994 + 0.0718X_1 + 0.1308X_2 + 0.3045X_3 + 0.1105X_4$  where Y is financial deepening level as shown by number of adults with access to finance and X1 is the growth in mobile money services growth in client base, X2 is the growth on amounts transacted via mobile money transfer services, X3 growth in accounts opened through mobile money transfer services and X4 is the growth in number of products related with mobile money transfer services.

**Table 4.18: Overall Model Coefficients**

Model	Unstandardized Coefficients	Std. Error	Standardized Coefficients	t	Sig.
(Constant)	-0.1994	0.0626		-3.1864	0.0023
Growth in MMT Clients	0.0718	0.4148	-0.0127	-0.1732	0.0086
Growth in Amount Transferred	0.1308	0.2360	-0.0388	-0.5544	0.0058
Growth in Accounts Opened	0.3045	0.1101	0.1904	2.7665	0.0075
Growth in Number of Products	0.1105	0.0101	0.8079	10.9102	0.0000

#### **4.4 Summary and Interpretation of the findings**

Regression analysis between financial deepening and mobile money transfer services found a coefficient of correlation (R) of 0.62 and coefficient of determination ( $R^2$ ) of 0.39. The R of 0.62 implies that mobile money transfer services have strong positive relationship with financial deepening in Kenya. The  $R^2$  of 0.39 implies that 39% of increase in financial deepening can be explained by the changes in penetration of mobile money transfer services. Further, regression analysis between financial deepening and development of new mobile money transfer services that includes

mobile based insurance has a coefficient of correlation of 0.82 and coefficient of determination of 0.67. This implies that development of new financial products related to mobile money transfer services can account for 67% of the changes in financial deepening levels in Kenya. The regression analysis obtained a p value of 0.0000 which implies that the relationship between financial deepening and number of financial products related to mobile money is significant at 95% confidence level.

The findings are related to those of Mbiti and Weil (2011) who found that Mpesa improved individual outcomes by promoting banking and increasing transfers hence promoting financial deepening. Also, Morawczynski and Pickens (2009) found that money transfer services were serving as a partial substitute for the formal banking system and promoted financial deepening. The findings are agree with those of Johnson (2012) who found that mobile money transfer had allowed relationships of exchange between equals to occur much more cheaply and efficiently, even extending the potential for social connections and negotiability to be developed through such means so offering new routes to financial access. More recently, the findings concur with those of Omwansa and Waema (2014) who found that mobile money services as a channel provided the reliability, convenience and flexibility needed by the poor and positively contributed to financial deepening.

Financial deepening has positive relationship with the various components of mobile money transfer services studied. This is shown by a coefficient of correlation of 0.8458 and coefficient of determination of 0.0.7154. The overall model developed from the findings is  $Y = - 0.1994 + 0.0718X_1 + 0.1308X_2 + 0.3045X_3 + 0.1105X_4$  where Y is financial deepening level as shown by number of adults with access to finance and X1 is the growth in mobile money services growth in client base, X2 is the growth on amounts transacted via mobile money transfer services, X3 growth in

accounts opened through mobile money transfer services and X4 is the growth in number of products related with mobile money transfer services. This implies that growth in number of bank accounts opened through mobile money services is the main factor determining the levels of financial deepening in Kenya since it has the highest coefficient. This is followed by growth in amount transacted through mobile money, number of mobile money financial products and increase in mobile money client base.

## CHAPTER FIVE

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### 5.1 Summary

The study sought to investigate the effect of mobile money transfer services on financial deepening in Kenya. Specifically, the study investigated the effect of mobile money financial products on financial deepening, contribution of amounts transacted through mobile money services, mobile money client base on financial deepening. The study found a strong positive and significant effect between financial deepening and mobile money transfer services in Kenya with a coefficient of correlation of 0.62. The coefficient of determination was found to 0.39 implying that 39% of growth in financial deepening in Kenya could be explained by the development of mobile money transfer services.

Further, development of new products related to mobile money transfer services that includes mobile based insurance and mobile banking services has positive significant effect on financial deepening in Kenya with a coefficient of correlation of 0.82. This implied that development of new financial products related to mobile money transfer services account for 67% of the changes in financial deepening levels in Kenya. The regression analysis obtained a p value of 0.0000 which implies that the relationship between financial deepening and number of financial products related to mobile money is significant at 95% confidence level. Mobile money transfer services were found to have continued experiencing positive growth in the period of the study.

## **5.2 Conclusion**

Based on the study findings, the study concludes that mobile money transfer services have a significant strong positive effect on financial deepening and in Kenya. Further, that mobile money transfer services have contributed significantly to deepening financial markets mostly out of the financial products related to mobile money developed. The adoption of these products had seen continued increase in number of bank accounts over the study period. The study also concludes that financial deepening in Kenya has been raising leading to 190% increase in financial access among adults in five years.

## **5.3 Recommendations for Policy**

From the study findings, the role of mobile money transfer services on financial deepening and financial access in Kenya cannot be under rated. Therefore the number of recommendations can be made for policy formulations. First, financial access is very vital for economic growth which can be enhanced by further development of mobile money transfer services. Therefore, policies aimed at promoting performance and growth of mobile money services should be formulated. Regulations should be in such a way that innovations on mobile money services are encouraged.

The amount transacted through mobile money every year is enormous. In addition, adoption by financial institutions mobile money based products like insurance and banking was found to lead to high increase in the number of banks clients and accounts. Therefore, financial institutions should embrace and integrate mobile money products into their products portfolio to promote their financial performance. This will ensure the institutions reach more people and develop more superior products which will further promote financial deepening.

To promote further growth of mobile money the study recommends that the communication authority of Kenya to come up with policies to open mobile money services to competitors. This will promote development of more innovative products by the mobile operators and financial institutions and hence further promote financial deepening.

Finally, the study recommends that the mobile money service operators to revise their transactional cost on mobile money transfer and benchmark the same with commercial banks rate. This will increase the customers' loyalty to the service and increase its revenue as more people will embrace the service thereby promoting financial access and consequently financial deepening.

#### **5.4 Limitations of the study**

Limitation for the purpose of this study included the circumstances that would have prevented the attainment of the set research objective. The first limitation to this study involved limited availability of secondary data. Getting consolidated data on the mobile money transaction and products in Kenya was not an easy. The researcher had to combine several sources in order to complete the study.

The second limitation of the study involved the use of financial access level on Kenya as a measure of financial deepening. However, financial access surveys were only done and published after five years. Hence, getting data on the period within the five years was limiting and unpublished information from financial deepening sector was to be obtained and relied upon.

Thirdly, the secondary relied on secondary data which was analyzed without any adjustment or verification. In addition, the study relied on information provided by

mobile money transfer services companies to the regulators. Hence the information could be distorted to avoid certain things or make certain impressions. The researcher had no way of adjusting the secondary data for any inconsistencies or temporary variations.

Finally, there was the limitation on time which was not enough for the research work. The researcher had to extra hours to compile the data, analyze the same and make the conclusions. Due to time limitation, the researcher could not have managed to go the details of confirming the gathered data with the mobile operators.

## **5.5 Recommendations for Further Research**

This study concentrated its efforts on the role of mobile money transfer services on financial deepening in Kenya. The study only considered the determinants of mobile money services without including other variables affecting the level of financial deepening in Kenya. Therefore, further studies could be done to establish the effect of mobile money services on financial deepening but including other variables that affect financial deepening.

In addition, the study used the level of financial access in the country as a measure of financial deepening level. Further study can be done using other measures to quantify the level of financial deepening in Kenya. The measures could include the number of products offered by commercial banks, increase in number of financial institutions, the ease of carrying out financial transaction and access to financial services among others.

This study also only relied on secondary data alone which has a limitation of excluding important information that could not be gathered from secondary sources. Therefore, further research is recommended on the effect of mobile money transfer services on financial deepening in Kenya but using both primary and secondary data sources.

Finally, further study can be done the effect of mobile money transfer services on financial deepening in Kenya but using longitudinal design. Data can be gathered over a period of time specifically to be used on the study. This will ensure more reliability and accuracy of the study findings and results.



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## APPENDICES

### Appendix I study Data

<b>Month, Year</b>	<b>MMT acc (000)</b>	<b>Accounts opened thro MMT(Thousands)</b>	<b>Total Payment made via MMT(KShs. Millions)</b>	<b>Total Value Transacted via MMT (KShs. Billions)</b>
Jun, 2014	120781	25.9284	74.0288	189.911
May, 2014	117807	25.8152	74.5472	198.131
Apr, 2014	116581	26.1399	72.0955	186.664
Mar, 2014	116196	26.208	73.9817	192.695
Feb, 2014	115015	26.1164	65.5934	172.797
Jan, 2014	114107	25.7568	67.0519	178.478
Dec, 2013	113130	25.3263	69.1378	182.495
Nov, 2013	112947	24.9	68.7	175.22
Oct, 2013	111697	24.43	68.27	175.29
Sep, 2013	110432	23.97	63.43	165.59
Aug, 2013	108559	23.87	64.71	168.1
Jul, 2013	105669	24.27	62.71	162.76
Jun, 2013	103165	23.75	60.03	152.5
May, 2013	100584	23.47	60.34	158.77
Apr, 2013	96319	23.0185	55.9993	142.609
Mar, 2013	93211	22.3292	52.3949	134.446
Feb, 2013	88393	21.8024	53.4683	141.126
Jan, 2013	85548	21.4181	53.4068	142.653
Dec, 2012	76912	21.06	55.96	150.16
Nov, 2012	75226	20.25	53.56	138.99
Oct, 2012	70972	20.02	51.89	137.68
Sep, 2012	67301	19.71	48.94	130.69
Aug, 2012	64439	19.38	49.7	131.38
Jul, 2012	63165	19.58	49.35	129.28
Jun, 2012	61313	19.7956	47.8763	124.02
May, 2012	59057	19.6943	47.9655	128.403
Apr, 2012	56717	19.53	44.35	117.36
Mar, 2012	55726	19.2393	45.757	126.093
Feb, 2012	53685	18.7921	41.7805	116.691
Jan, 2012	52315	18.834	40.2449	114.06
Dec, 2011	50471	19.191	41.7075	118.08
Nov, 2011	49091	19.46	41.1769	112.332
Oct, 2011	47874	19.2097	40.55	109.119
Sep, 2011	46234	18.8916	39.2139	108.615
Aug, 2011	44762	18.6128	39.2993	107.424
Jul, 2011	43577	18.3082	37.9763	99.7104

<b>Month, Year</b>	<b>MMT acc (000)</b>	<b>Accounts opened thro MMT(Thousands)</b>	<b>Total Payment made via MMT(KShs. Millions)</b>	<b>Total Value Transacted via MMT (KShs. Billions)</b>
Jun, 2011	42840	18.1469	35.8222	92.6437
May, 2011	38485	17.9239	35.3457	94.3724
Apr, 2011	37309	17.7573	32.4254	86.0877
Mar, 2011	36198	17.4653	32.7301	88.9966
Feb, 2011	34572	16.8928	28.5462	76.3366
Jan, 2011	33968	16.6901	28.2047	75.4328
Dec, 2010	39449	16.4463	29.1183	75.8654
Nov, 2010	38201	16.075	30.0386	70.2727
Oct, 2010	37009	15.7346	31.3186	71.7947
Sep, 2010	35373	15.2239	29.4457	68.5062
Aug, 2010	33864	14.5893	26.8233	61.531
Jul, 2010	32974	13.4701	26.915	61.7728
Jun, 2010	31902	10.9147	25.0338	58.0993
May, 2010	31036	10.4928	24.6984	58.0795
Apr, 2010	29570	10.2026	22.6933	51.8136
Mar, 2010	27622	9.97211	24.0758	56.1167
Feb, 2010	25394	9.67495	20.8087	49.9055
Jan, 2010	24850	9.4767	20.0767	48.4625
Dec, 2009	23012	8.88258	21.6891	52.3417
Nov, 2009	22476	8.61529	19.975	47.4656
Oct, 2009	20631	8.36803	19.92	48.6365
Sep, 2009	19803	8.01624	18.3703	45.3683
Aug, 2009	18780	7.7141	17.0104	40.6787
Jul, 2009	18504	7.42641	16.8986	40.3374
Jun, 2009	16641	7.19062	15.9846	38.1756
May, 2009	16029	6.8427	15.0488	36.8062
Apr, 2009	14790	6.53192	13.7796	34.0201
Mar, 2009	13358	6.28952	13.5541	33.8202
Feb, 2009	7512	5.81602	11.0793	28.6863
Jan, 2009	7304	5.47828	10.1906	27.0749
Dec, 2008	6104	5.08247	10.2051	26.99
Nov, 2008	5399	4.75139	8.56681	21.7
Oct, 2008	4781	4.42028	8.30365	21.6007
Sep, 2008	4230	4.14304	7.15191	19.2699
Aug, 2008	3761	3.72618	6.34241	16.7563
Jul, 2008	3378	3.36719	5.39108	14.0171
Jun, 2008	3011	3.03852	4.20144	10.9172
May, 2008	2770	2.71813	4.02127	10.9042
Apr, 2008	2606	2.37346	3.07289	8.38964
Mar, 2008	2329	2.07553	2.3975	6.74745
Feb, 2008	2067	1.82153	1.7399	5.21979
Jan, 2008	1812	1.5891	1.34683	4.05904

<b>Month, Year</b>	<b>MMT acc (000)</b>	<b>Accounts opened thro MMT(Thousands)</b>	<b>Total Payment made via MMT(KShs. Millions)</b>	<b>Total Value Transacted via MMT (KShs. Billions)</b>
Dec, 2007	1582	1.34527	1.2741	3.77027
Nov, 2007	1379	1.1332	1.22174	3.51495
Oct, 2007	1196	0.875962	0.958908	2.82955
Sep, 2007	960	0.635761	0.669689	2.06969
Aug, 2007	819	0.432555	0.516239	1.57991
Jul, 2007	681	0.268499	0.354298	1.06537
Jun, 2007	527	0.175652	0.233661	0.720102
May, 2007	447	0.107733	0.15	0.483709
Apr, 2007	362	0.054944	0.07	0.220896
Mar, 2007	307	0.020992	0.021714	0.0643905