EFFECT OF MOBILE BANKING ON SELECTED MACROECONOMIC
FACTORS IN KENYA

BY

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FULFILLMENT OF THE REQUIREMENTS FOR AWARD OF
MASTER OF BUSINESS ADMINISTRATION DEGREE, SCHOOL OF
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DECLARATION

This management research project is my original work and to the best of my knowledge, it has not been submitted for a degree in any other university.

Signed ___feb_____Date

Gaudencia Aduka Machio

D61/70922/2009

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

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ACKNOWLEDGEMENT

First and foremost I thank the Almighty God for his guidance, providence and protection from the beginning of this program until now. I also thank him for giving me good health and helping me to get finances for this course.

Secondly I thank my supervisor Mrs. Nyamute W who has guided and encouraged me from the beginning till the end of the research project, my entire family and friends for their support and all those who enabled me gather needed information for the research.

DEDICATION

I dedicate this work to my father Mr. Francis Oratta Machio, my mother Mrs. Florence Tsindoli Machio, my sisters Pauline, Lillian, Dolly, Gertrude, Caroline and Roseline and all my friends for their continued moral and financial support throughout the course.

To my unborn child who has given me the spirit of patience and perseverance

ABSTRACT

Mobile banking is the provision of banking services using handheld devices such as palmtops, mobile phones and personal digital assistants. Mobile banking is a relatively new technology which is being adopted at a rate. Macroeconomic factors are such factor that are pertinent to a broad economy at the regional or national level and affects a large population rather than a few select individuals. Macroeconomic factors such as Inflation, savings and investment are key indicators of economic performance and are closely monitored by government, businesses and consumers. With improvement of mobile technologies and devices, banking users are able to conduct banking services at any place at any time. Recently, many banks in the world have provided mobile access to financial information. Understanding the various macroeconomic factors that contribute to user's intention to use mobile banking is an important issue. The objective of this study was to determine the effect of mobile banking on selected macroeconomic factors in Kenya.

Secondary data of all 44 commercial banks in Kenya was used for the study and collected from banks annual report for three years (2007-2009). The number of customers registered for the mobile banking service was regressed against three variables namely savings, investment and inflation. The results of the study were analysed using Statistical package for social studies (SPSS Version) where different data were analysed in form of tables, pie charts and graphs.

The findings indicated that inflation rate was 11.62% for the 3years.Savings had very low standard deviation hence indicates that most banks within three years had almost the same savings as Central Bank of Kenya and the average number of mobile customers was 544225 people. Findings also showed that savings and investment increasing from 2007-2008 with 37% of banks had accounts having less than 250,000 account holders in 2009, 37% of banks had accounts less than 250,000 in 2008 and 37% of banks had account numbers less than 200,000 holders in 2007. In conclusion there was no direct relationship between effect of mobile banking and the selected macroeconomic factors that is inflation, savings and investment.

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INTRODUCTION

1.1 Background of the Study

According to Oliver (2000) Macroeconomic factors are such factors that are pertinent to a broad economy at the regional or national level and affects a large population rather than a few select individuals. Macroeconomic factors such as Inflation, savings and investment are key indicators of economic performance and are closely monitored by government, businesses and consumers.

Inflation: According to Andrew (2005) inflation is a rise in general level of prices of goods and services in an economy over time. When the price level rises, each unit of currency buys fewer goods and services; consequently, inflation is also erosion in the purchasing power of money - a loss of real value in the internal medium of exchange and unit of account in the economy. Manifold and can be simultaneously. A chief measure of price inflation is the inflation rate, the annualized percentage change in price index (normally the consumer price index) over time. Inflation effects in an economy are positive and negative. Negative effects of inflation include a decrease in the real value of money and other monetary items over time; uncertainty about future inflation may discourage investment and savings, or may lead to reductions in investment of productive capital and increase savings in non- productive assets e.g. selling stocks. Positive effects include a mitigation of economic recessions, and debt relief by reducing the real level of debt. High rates of inflation and hyperinflation can be caused by excessive growth of money supply.

Savings: According to Random House (2006) savings is income not spent, or deferred consumption. Methods of saving include putting money aside in a bank or pension plan. Saving also includes reducing expenditures, such as recurring costs. In terms of personal finance, saving specifies low-risk preservation of money, as in a deposit account, versus investment, wherein risk is higher.

Saving is closely related to investment. By not using income to buy consumer goods and services, it is possible for resources to instead be invested by being used to produce fixed capital, such as factories and machinery. Saving can therefore be vital to increase the amount of fixed capital available, which contributes to economic growth.

However, increased saving does not always correspond to increased investment. If savings are stashed in a mattress or otherwise not deposited into a financial intermediary like a bank there is no chance for those savings to be recycled as investment by business. This means that saving may increase without increasing investment, possibly causing a short-fall of demand (a pile-up of inventories, a cut-back of production, employment, and income, and thus a recession) rather than to economic growth. In the short term, if saving falls below investment, it can lead to a growth of aggregate demand and an economic boom. In the long term if saving falls below investment it eventually reduces investment and detracts from future growth. Future growth is made possible by foregoing present consumption to increase investment. However savings kept in a mattress amount to an (interest-free) loan to the government or central bank, who can recycle this loan.

Investment: According to Arthur (2003) inflation is the commitment of money or capital to purchase financial instruments or other assets in order to gain profitable returns in the form of interest, income {dividend}, or appreciation of the value of the instrument. It is related to saving or deferring consumption. Investment is involved in many areas of the economy, such as business management and finance no matter for households, firms, or governments. An investment involves the choice by an individual or an organization such as a pension fund, after some analysis or thought, to place or lend money in a vehicle, instrument or asset, such as property, commodity, stock, bond, financial derivatives (e.g. futures or options), or the foreign asset denominated in foreign currency, that has certain level of risk and provides the possibility of generating returns over a period of time.

Investment comes with the risk of the loss of the principal sum. The investment that has not been thoroughly analyzed can be highly risky with respect to the investment owner

because the possibility of losing money is not within the owner's control. The difference between speculation and investment can be subtle. It depends on the investment owner's mind whether the purpose is for lending the resource to someone else for economic purpose or not.

Laudon and Laudon (2005) defines Mobile banking as the provision of banking services using handheld devices such as mobile phones, palmtop computers and personal digital assistants. Mobile banking system is a relatively new technology which is being adopted at a high rate. Making mobile banking deployments work is like connecting the dots in a big economic jigsaw puzzle. Only if all players in the complex eco-system win does mobile banking take off. If the economic benefit to the key players is not clear, then they will not support the solution and it will go nowhere. In most deployments, agents and the agent-network are probably the most critical element for the whole thing to work. It is therefore absolutely essential that agents benefit from running the system. As a matter of fact, the more they benefit, the more they will push the solution. It is in the interest of the operator of mobile banking services, to pay the agents as much as possible. Often, mobile payment consultants urge operators to make the service as affordable as possible. They argue that subscribers will use the system if it is really cheap. If one were to make the fees zero, people would really use the system. If the operator does not generate sufficient revenue from subscribers, they will not be able to offer agents a big enough incentive to sign up customers and to motivate them to use the system. It is more critical to feed the agents, and not as important to feed the subscriber.

The spread of mobile phones across the developing world is one of the most remarkable technology stories of the past decade. Buoyed by prepay cards and inexpensive handsets, hundreds of millions of first-time telephone owners have made voice calls and text messages part of their daily lives. However, many of these same new mobile users live in informal and/or cash economies, without access to financial services that others take for granted. Indeed, across the developing world, there are probably more people with mobile handsets than with bank accounts. Various initiatives use mobile phones to provide financial services to "the unbanked." These services take a variety of forms—including long-distance remittances, micro payments, and informal airtime bartering schemes—and

go by various names, including mobile banking, mobile transfers, and mobile payments. Taken together, they are no longer merely pilots; in the Philippines, South Africa, Kenya, and elsewhere, these services are broadly available and increasingly popular Porteous (2006).

A wide spectrum of Mobile branchless banking models is evolving. However, no matter what business model, if mobile banking is being used to attract low-income populations in often rural locations, the business model will depend on banking agents, i.e., retail or postal outlets that process financial transactions on behalf Telco's or banks. The banking agent is an important part of the mobile banking business model since customer care, service quality, and cash management will depend on them. Many Telco's will work through their local airtime resellers. However, banks in Colombia, Brazil, Peru, and other markets use pharmacies, bakeries, etc.

These models differ primarily on the question that who will establish the relationship (account opening, deposit taking, lending etc.) to the end customer, the Bank or the Non Bank/Telecommunication Company (Telco). Another difference lies in the nature of agency agreement between bank and the Non-Bank. Models of branchless banking can be classified into three broad categories - Bank Focused, Bank-Led and Nonbank-Led Krueger (2009).

Scholarly research on the adoption and socioeconomic impacts of m-banking/m-payments systems in the developing world are scarce. Even less attention has been paid to the social, economic, and behavioural contexts surrounding the use of these systems. This paper's goals are threefold: first, it calls attention to this gap in the research literature and emphasizes the need for research focusing on the context(s) in which m-banking/m-payments systems are used. Second, it argues that, to the extent it helps reveal the myriad social, behavioural and economic influences on use, this contextual research is not simply a complement but rather a critical input to effective "adoption" or "impact" research. Finally, the paper argues that the challenges of generating interdisciplinary dialogue about m-banking in the developing world is illustrative of long-running dynamics within the community of scholars and practitioners concerned with Information and Communication Technologies and Development (ICTD). The m-banking case adds new wrinkles to

broader discussions about technology and development, and about mobiles in society Maurer (2008).

1.2 Statement of the Problem

Mobile banking has come in handy in many parts of the world with little or no Infrastructure development, especially in remote and rural areas. This part of the mobile commerce is also very popular in countries where most of their population is unbanked. In most of these places banks can only be found in big cities and customers have to travel hundreds of miles to the nearest bank. Countries like Sudan, Ghana and South Africa received this new commerce very well. In Latin America countries like Uruguay, Paraguay, Argentina, Brazil, Venezuela, Colombia, Guatemala and recently Mexico started with a huge success. Kenya's Safaricom (Part of the Vodafone Group) has had the very popular M-Pesa Service - mainly used to transfer limited amounts of money, but has been increasingly used to pay utility bills. Zain in 2009 launched their own mobile money transfer business known as ZAP in Kenya and other African countries. Stephan (2007),

People in developing countries have less options for transferring money and accessing banking services, because there is less deployed formal banking structure: fewer branches with ATMs generally co-located to relieve branches, and low internet penetration. So a branchless banking channel using mobile phones could be far more suitable to poor people than the available options like traveling and queuing up at distant branches, forgoing their daily wages. Only about one-third of people living in developing countries have any form of financial savings with formal institutions. Ultimately, the mobile banking using technology has great potential to extend the distribution of financial services to poor people who are not reached by traditional banking networks as it lowers the cost of delivery, including costs both to banks in building and maintaining a delivery channel, and to customers in accessing financial services. Hence the success factors for mobile banking depend upon the mass customer adoption, utility of mobile service for cash-in and cash-out transactions, interoperability of providers, a country's defined proportionate regulation and the ability of service providers to meet the regulatory challenges, Rani (2010)

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Boaz Juma Otieno (2008) looked at the challenges in the implementation of mobile banking information systems in commercial banks in Kenya.

Given the many and recent developments in banking services and the fact that the studies that have been done so far on mobile banking have not looked at effects of mobile banking on selected macroeconomic factors in Kenya, this study aims at filling the knowledge gaps poised by the above empirical studies, this study poses the research question: "the effect of mobile banking on selected macroeconomic factors in Kenya." The study hypothesizes that commercial banks should demonstrate to improve mobile banking through the macro economics. To answer the above question, the study will measure the effects of macroeconomic factors by reviewing the three major macroeconomic factors in Kenya. Therefore, the study will need to take into account the Macroeconomists develop models that explain the relationship between such factors as inflation, savings, and investment.

1.3 Objective of the Study

To determine the effect of mobile banking on selected macroeconomic factors in Kenya.

1.4 Significance of the Study

The Management

The management, especially the top level management will use the study to understand how mobile banking affects the macroeconomic factors in Kenya and set up strategies

Other Researchers

Researchers will use the study to get information about the concept of mobile banking and macroeconomic factors in Kenya in order to use them on other projects, which will help them get more information on the literature review.

The Government

The government will obtain information on the importance of implementation of various legal frameworks in relation to mobile banking. M-Pesa.

Academicians

 In addition to contributing to the body of knowledge, the research will also help and encourage continuity as far as doing further research is concerned.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of related literature and various concepts on the subject under study presented by various researchers, scholars, analysts, theorists and authors. The researcher has drawn materials from several sources which are closely related to the theme and objectives of the study.

2.2 Mobile Banking

Mobile Banking refers to provision of banking- and financial services with the help of mobile telecommunication devices. The scope of offered services may include facilities to conduct bank and stock market transactions, to administer accounts and to access customized information. According to this model Mobile Banking can be said to consist of three inter-related concepts: Mobile Accounting, Mobile Brokerage, and Mobile Financial Information Services. Most services in the categories designated Accounting and Brokerage are transaction-based. The non-transaction-based services of an informational nature are however essential for conducting transactions - for instance, balance inquiries might be needed before committing a money remittance. The accounting and brokerage services are therefore offered invariably in combination with information services. Information services, on the other hand, may be offered as an independent module. The advent of the Internet has enabled new ways to conduct banking business, resulting in the creation of new institutions, such as online banks, online brokers and wealth managers. Such institutions still account for a tiny percentage of the industry. Over the last few years, the mobile and wireless market has been one of the fastest growing markets in the world and it is still growing at a rapid pace. According to the GSM Association and Ovum, the number of mobile subscribers exceeded 2 billion in September 2005, and now exceeds 2.5 billion (of which more than 2 billion are GSM).

Eagle spent the last few years going back and forth between Kenya and the U.S., and he witnessed this transformation firsthand. I caught up with him after his talk to learn more.

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With mobile technology, banks can offer services to their customers such as doing fund transfer while traveling, receiving online updates of stock price or even performing stock trading while being stuck in traffic. Smart phones and 3G connectivity provide some capabilities that older text messages only phones do not. Anne (2009)

According to Eagle, local incumbent Safaricom had started a minute-sharing service for its prepaid cell phone plans a few years back. The idea was to enable users to send minutes to family members in rural areas, who weren't otherwise able to buy prepaid phone cards. However, Kenyans quickly came up with other uses. "Lots and lots of people were using it as a surrogate for currency," Eagle said. "[You] could literally pay for taxi cab rides using cell phone credit." Safaricom realized a huge opportunity and started a mobile payment service called M-PESA. To call M-PESA a success would be an understatement, according to Eagle. Rural communities used to have to pay a lot of money upfront in order to get a modern well capable of providing clean drinking water. Now, there are companies that install these wells for free, complete with an integrated cell phone payment system. Want some water? Just pay as you go with your M-PESA account Janko (2009).

2.3 Macroeconomic Factors

According to Oliver (2000) According to Oliver (2000) Macroeconomic factors are such factors that are pertinent to a broad economy at the regional or national level and affects a large population rather than a few select individuals. Macroeconomic factors such as Inflation, savings and investment are key indicators of economic performance and are closely monitored by government, businesses and consumers.

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positive and negative. Negative effects of inflation include a decrease in the real value of money and other monetary items over time; uncertainty about future inflation may discourage investment and savings, or may lead to reductions in investment of productive capital and increase savings in non- productive assets e.g. selling stocks. Positive effects include a mitigation of economic recessions, and debt relief by reducing the real level of debt. High rates of inflation and hyperinflation can be caused by excessive growth of money supply.

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Saving is closely related to investment. By not using income to buy consumer goods and services, it is possible for resources to instead be invested by being used to produce fixed capital, such as factories and machinery. Saving can therefore be vital to increase the amount of fixed capital available, which contributes to economic growth.

However, increased saving does not always correspond to increased investment. If savings are stashed in a mattress or otherwise not deposited into a financial intermediary like a bank there is no chance for those savings to be recycled as investment by business. This means that saving may increase without increasing investment, possibly causing a short-fall of demand (a pile-up of inventories, a cut-back of production, employment, and income, and thus a recession) rather than to economic growth. In the short term, if saving falls below investment, it can lead to a growth of aggregate demand and an economic boom. In the long term if saving falls below investment it eventually reduces investment and detracts from future growth. Future growth is made possible by foregoing present consumption to increase investment. However savings kept in a mattress amount to an (interest-free) loan to the government or central bank, who can recycle this loan.

Investment: According to Arthur (2003) inflation is the commitment of money or capital to purchase financial instruments or other assets in order to gain profitable returns in the

form of interest, income {dividend}, or appreciation of the value of the instrument. It is related to saving or deferring consumption. Investment is involved in many areas of the economy, such as business management and finance no matter for households, firms, or governments. An investment involves the choice by an individual or an organization such as a pension fund, after some analysis or thought, to place or lend money in a vehicle, instrument or asset, such as property, commodity, stock, bond, financial derivatives (e.g. futures or options), or the foreign asset denominated in foreign currency, that has certain level of risk and provides the possibility of generating returns over a period of time.

Investment comes with the risk of the loss of the principal sum. The investment that has not been thoroughly analyzed can be highly risky with respect to the investment owner because the possibility of losing money is not within the owner's control. The difference between speculation and investment can be subtle. It depends on the investment owner's mind whether the purpose is for lending the resource to someone else for economic purpose or not.

2.4 Mobile Banking Business Models

According to Ravallion (1993) a wide spectrum of Mobile/branchless banking models is evolving. However, no matter what business model, if mobile banking is being used to attract low-income populations in often rural locations, the business model will depend on banking agents, i.e., retail or postal outlets that process financial transactions on behalf Telco's or banks. The banking agent is an important part of the mobile banking business model since customer care, service quality, and cash management will depend on them. Many Telco's will work through their local airtime resellers. However, banks in Colombia, Brazil, Peru, and other markets use pharmacies, bakeries, etc. These models differ primarily on the question that who will establish the relationship (account opening, deposit taking, lending etc.) to the end customer, the Bank or the Non-Bank/Telecommunication Company (Telco). Another difference lies in the nature of agency agreement between bank and the Non-Bank. Models of branchless banking can be classified into three broad categories - Bank Focused, Bank-Led and Nonbank-Led.

2.4.1 Bank-focused model

The bank-focused model emerges when a traditional bank uses non-traditional low-cost delivery channels to provide banking services to its existing customers. Examples range from use of automatic teller machines (ATMs) to internet banking or mobile phone banking to provide certain limited banking services to banks' customers. This model is additive in nature and may be seen as a modest extension of conventional branch-based banking.

2.4.2 Bank-led model

The bank-led model offers a distinct alternative to conventional branch-based banking in that customer conducts financial transactions at a whole range of retail agents (or through mobile phone) instead of at bank branches or through bank employees. This model promises the potential to substantially increase the financial services outreach by using a different delivery channel (retailers/ mobile phones), a different trade partner (Telco / chain store) having experience and target market distinct from traditional banks, and may be significantly cheaper than the bank-based alternatives. The bank-led model may be implemented by either using correspondent arrangements or by creating a JV between Bank and Telco/non-bank. In this model customer account relationship rests with the bank

2.4.3 Non-bank-led model

The non-bank-led model is where a bank has a limited role in the day-to-day account management. Typically its role in this model is limited to safe-keeping of funds. Account management functions are conducted by a non-bank (e.g. Telco) who has direct contact with individual customer

2.5 Mobile Banking in Kenya

Quite a number of commercial banks are offering Mobile banking in Kenya; to sample but a few;

2.5.1 Kenya commercial bank (KCB) - KCB direct

Kenya Commercial Bank Limited provides corporate and retail banking services. The company offers various personal banking products and services, such as savings and current accounts, personal loans, easy pay loans, and salary advances; Visa and MasterCard credit and prepaid cards; and Biashara banking products, which include business current accounts, business investment accounts, business facilities, fixed and short term deposits, Mavuno loans, small scale enterprise loans, e-statements, and grace loans to business customers. It also operates Biashara Club that offers workshops on entrepreneurship and capacity building, networking, business advisory services through SME management seminars and workshops, and business trips to tap into new markets; and offers micro banking services to micro and small entrepreneurs. In addition, the company provides corporate banking products, such as custody services, asset finance and insurance premium finance, corporate finance, and trade finance. Further, it offers foreign exchange products, such as foreign exchange cash purchase/sale, swift transfers, foreign drafts, travelers' cheques, foreign currency accounts, and foreign exchange forwards and swaps; money market products, which include fixed deposits, treasury bill and bond investments, and short term credit lines; cash management products and services; and institutional banking products. The company operates a network of approximately 203 branches and 325 automated teller machines. It has operations in Kenya, Southern Sudan, Tanzania, Uganda, and Rwanda. The company was founded in 1896 and is based in Nairobi, Kenya.

Kenya Commercial Bank customers traveling to Rwanda are able to access their accounts through the bank's money transfer service by October, eliminating risks of carrying cash. The bank plans to roll out a KCB connect in Kigali, Rwanda interfaced with Safaricom's money transfer service M-pesa, where users can shuffle money from their accounts into their phones and vice versa through a platform called unstructured supplementary service data (USSD). Mr. Tom Kahigu, the bank's head alternative business channels and

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innovations, said the product will soon be connected to other mobile money transfer services like Yu cash and Zap, giving clients a larger network choice. Kenya Commercial Bank (KCB) and Essar's Yu are doing a pilot test of their systems while discussing the contract with Zain's Zap. KCB connect is not limited to KCB account holders and has so far attracted 200,000 users with a potential to reach 6.4 million customers, nine times the bank's current reach. The move to widen this product's footprint comes at a time when most banks are adopting mobile and Internet banking as a means of cutting operational cost, reaching the unbanked and creating ease to their customers.

Kahigu (2010) states that improved telecommunication infrastructure had opened vast opportunities for innovative services that have seen banks enter into agreements with telecommunication companies to offer services. Mobile telecommunications provider Zain enhanced its mobile banking service, Zap, in partnership with Standard Chartered and Citi Bank to enable customers receive money from any bank account around the world and easily send money to any bank in Kenya, Tanzania and Uganda. Analysts say that banks are offering either Internet or mobile banking tend to get high net worth clientele and are also able to lock in their customers. Some of the services now available either for mobile baking or Internet banking is balance confirmation, receiving mini statements, paying of bills.

2.5.2 Barclays bank of Kenya - hello money

Barclays launched Hello Money, a groundbreaking service that enables customers to perform transactions in real time over their mobile phones. The technology combines security, accessibility and convenience, the aim is to transform the way people in India's rural areas access and use financial services. Since its launch, the Hello Money service generated an enthusiastic response from customers. Customers find the service friendly and easy to use, helped by the fact that Hello Money is built on USSD (Unstructured Supplementary Service Data) technology that mirrors other interactions on a mobile phone, while also enabling rapid and highly secure transmission of information across a GSM net.

Hello Money's accessibility is enhanced by several other attributes. Unlike some other competing services, Hello Money is independent of mobile handset models, SMS or

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GPRS connectivity. Also, the consumer accesses the service using a short code, and does not need to remember complex keywords or message formats, or to download or install any applications. Hello Money can be operated in the local language or in English and customers can use the service to check balances, transfer funds and pay bills. Clearly, security is a critical concern with any mobile banking service, and this has been built in to Hello Money. Its use of the USSD protocol ensures that no information is stored on the customer's phone handset, and that there is no loss of data at either end. Security is further strengthened by built-in USSD encryption and the use of a PIN to prevent unauthorized access.

2.5.3 Consolidated bank - M-cell

Consolidated Bank of Kenya Ltd endeavors' to provide high quality banking and financial

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services. Currently, the bank has 10 branches and one agency located in various parts of the country. The bank enjoys an independent, dynamic, results oriented culture and a flexible and innovative approach. We understand the environment in which our clients operate and offer a service built on personalized and specialized banking solutions. The bank is Information and Communication Technology driven and has implemented an on-line real time banking system (Bank master) that enables transactions to be carried out at any of our branches. The bank is fully owned by the Government with the majority shareholding in the bank (51%) held by the Treasury through the Deposit Protection Fund. The remaining shareholding is spread over twenty five (25) parastatal and other government related/controlled organizations. Consolidated Bank of Kenya Limited was incorporated on 7th December, 1989 under the Companies Act and is licensed under the Banking Act.

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remaining shareholding is spread over twenty five (25) parastatal and other government related/controlled organizations. Consolidated Bank of Kenya Limited was incorporated on 7th December, 1989 under the Companies Act and is licensed under the Banking Act.

2.5.4 Equity bank - M kesho

The mobile banks consist of an all terrain four-wheel drive vehicles, are manned by 2-3 bank employees who meet customers at designated market places on fixed days each week. Once there, the team serves customers from buildings that have been rented out at the market places. The mobile units use solar power to run a computerized transaction processing system that is directly linked to the home branches via GPS and satellite. The mobile bank project reverses a long term trend for commercial banks in Kenya to withdraw from rural areas. Equity has fully integrated the mobile operations into its business model. Mobile units are seen as core to expanding the bank's footprint and customer base. Satellite centers with sufficient business volumes can become fixed branches, enabling the mobile unit to take services to new and more remote customers. This model can be easily replicated. Equity has been approached by a number of banks throughout Africa interested in understanding and adopting this model for their own operations. The results have been impressive. There are now more than 120 villages covered by mobile units, a six fold increase over the original target of 20, and the units are servicing some 40,000 new customers, of which nearly half are women.

2.6 Empirical Review of Effects of Mobile Banking On Selected Macroeconomic Factors in Kenya

Jamie Zimmerman (2010) as recently as two years ago, mobile banking in the developing world was an object of skepticism among financial insiders. Many thought of mobile banking as a niche product that, at most, could maintain the loyalty of existing traditional bank customers, few imagined it might bring savings and liquidity to those who don't belong to the bank in the first place. The spontaneous and unplanned exploitation of m-banking in the developing world has gone well beyond expectations. And the effects for development could be monumental. Three years ago, Safaricom, the

Kenyan subsidiary of Vodafone launched M-Pesa and in May it partnered with Equity bank and offered M-Kesho, an interest bearing savings account, to all M-pesa users. M-bankers worldwide already use their mobile accounts as defacto savings accounts simply by keeping cash credit. These developments foreshadow a range of exciting opportunities in servicing the low income unbanked and reducing the corruption associated with loans and financing in the developing world.

Rudiger, Stanley, Richard (2007) One reason that high growth countries are high growth countries is because they devote a substantial fraction of their output to investment. Investment is determined by both the demand for capital and supply of savings. Investment increases capital increasing the productive capacity of the economy.

Rudiger, Stanley, Richard (2007) One important effect of inflation is redistributing wealth between debtors and creditors. It also redistributes income at the expense of wage earners. Inflation causes price to rise faster than wages and therefore allows profits to expand.

According to Koivu (2002) the uptake of mobile phones in Kenya has been unprecedented. Mobile banking in Kenya affects the performance, structure, behavior and decision-making of the entire economy being the macroeconomic factors. This trend of continued reliance on mobile devices to execute monetary transactions is steadily gaining momentum. In an effort to gauge the implications of this mobile phone phenomenon, this study set sets out to bring to light the critical issues arising from the emergent mobile technology innovations. The remarkable gains made towards mobile phone access have seen a steady progress in the scope of innovations emanating from exploitation of these fairly new technologies. What has characterized the Kenyan mobile landscape is a rapid uptake of various services key among them the mobile based products. Mobile banking is one innovation which has progressively rendered itself in pervasive ways cutting across numerous sectors of economy and industry. An appropriate banking environment is considered a key pillar as well as an enabler of economic growth.

2.7 Evolution of Mobile Banking In Kenya

Mobile banking started with the creation of services by banks which could be accessed through the mobile phone. These facilities aimed to enable customer's access information relating to their accounts. Subsequent innovations have seen the mobile banking phenomena continue to grow steadily. Mobile banking takes several dimensions of execution all representing a new distribution channel that allows financial institutions and other commercial actors to offer financial services outside traditional bank premises. The transformational mobile banking is made available by mobile phone service providers as part of their value added services. It is embedded among other services within the service providers menu. The perceived difference between mobile service providers mainly lies on the pricing strategy, quality and scope of services as well as the pricing strategy. The mobile banking services are available to mobile phone users of the two major mobile service providers namely Safaricom and Zain. Safaricom's service is branded "M-pesa" and Zains service goes by the "Zap" brand name. The latest entrants i.e. Orange / Telkom and Econet wireless are also expected to roll out their mobile banking services in the course of time. While the fees charged for transactions are largely below those levied by traditional banks for similar services, low incomes amongst the vast proportions of the population tends to reduce the levels of affordability. But prices are expected to decline over time as competition intensifies. For instance the launch of Zap service at a flat rate of Kshs. 10 ($0.3) is expected to have a ripple effect on M-pesa whose average transaction charge stands at Kshs. 35 ($ 0.5). The collective access points of mobile banking are numerous and widespread. The service vests a heavy reliance on airtime distributors who double as agents. It is these agents who decide on the most strategic points to locate their service outlets. This highly differs from the conventional banking systems whereby banks will only be located in major urban centers. Currently Safaricom has over 5,000 agents across the country; while Zain prides itself of having over 3,000 agency set ups in the short span it has operated the Zap service Steven *et al* (2003).

2.8 Conclusion summary

With the improvement of mobile technologies and devices, banking users are able to conduct banking services at any place at any time. Recently, many banks in the world have provided mobile access to financial information. Understanding the various macroeconomic factors that contribute to user's intention to use mobile banking is an important issue in this research. Kenyan mobile banking sector presents a delightful outlook of exploitation. Most individuals acknowledge the importance of the mobile based banking service in a myriad of their daily activities. Usage patterns appear to be largely driven by personal missions and marketing strategies of service providers. Depending on the nature of activities and requisite levels of expediency users will employ M-banking in variable ways. In addition there is a dimension of use attributable to the "hype factor". Certain users have boarded the usage train out of the excitement and image believed to originate from the M-banking utilization atmosphere. Though M- banking seems to cut across all groups, usage is more pronounced among younger age groups. With reference to income opinion is divided as appertains to the thresholds that trigger entry into M-banking. Some users with no specific income sources were identified as regular users implying a huge possibility that they rely on income of others. What this signifies is the fact that M-banking has created a formidable avenue for income redistribution. In summary the demands of vibrant M-banking implementations revolve around improved network coverage, quality connections besides reduced costs to ensure affordability to all prospective partakers. Service providers might be better of availing the service at lower costs to net more users rather than insisting on high levies which frighten off some possible participants. By so doing they will be able to boost their revenue streams by promoting the volume of transactions. On the policy front, there is an urgent need to device policies and strategies to reverse gaps in terms of investment, savings and rural - urban demographics. M-banking therefore has great impact on the selected macroeconomic factors in Kenya.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Research design

The research was an empirical study carried out as a survey of all the 44 commercial banks registered and operating in Kenya as at 31" December 2009. This is deemed appropriate because the study will involve an in depth study of the effects of mobile banking on selected macro-economic factors in Kenya.

3.2 Population

A target population of the study comprised of all 44 registered commercial banks in Kenya which were in operation as at 31st December 2009 listed by the Central Bank of Kenya. These organizations are involved in providing financial services to their clients. The entire population was chosen. An appendix of the list is provided.

3.3 Data collection

Secondary data was used for the study. The data that is the number of customers subscribed to the mobile banking service and macro economic data (inflation, savings, and investment) was collected from banks' annual reports for all the 44 commercial banks for the 3- year period 2007-2009. This was deliberately selected because mobile banking service was implemented in the early 2007.

3.6 Data analysis

The study used multiple regression technique for analyzing data. Regression analysis is used when a researcher is interested in finding out whether an independent variable predicts a given dependent variable. Multiple regression attempts to determine whether a group of variables together predict a given dependent variable The collected data was edited for consistency, accuracy, uniformity and completeness and tabulated before

analysis was carried out. Given that this was a descriptive design analysis of the effects of mobile banking on selected macro-economic factors in the target banks was analyzed using pie charts, tables and graphs for easier interpretation

A proportion of different macroeconomic factors were used as an indication of the effects of mobile banking in Kenya.

Regression Equation was as follows

$Y - a + b_j x_j + b_2 x_2 + b_3 x_3 + e$

Where

Y = Number of customers subscribed to the mobile banking service (dependant variable).

X = Macroeconomic factors (independent variable)

x_1 - Inflation

X_2~ savings

   investment

a = constant term explaining the level of effects of mobile banking

b = is the marginal changes in macroeconomic factors

e = error

Given that this was a descriptive design, data analysis of the effects of mobile banking on selected macro-economic factors in the target banks was done using correlation coefficient and coefficient of determination to establish the nature and the strength of relationship while the test of significance was undertaken to analyze the magnitude of the relationship. The analysis of quantitative data was carried out using SPSS version 17 (statistical package for social Science) and presented inform of tables, graphs and pie charts while contextual data was analyzed qualitatively.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter contains the detailed data analysis and findings of the study. The data was analysed, summarized and presented in form of tables, graphs and pie charts.

4.2 Regression Results

4.2.1 Overall Model Summary

The number of customers registered for the mobile banking service was regressed against three independent variables namely; Inflation, savings and investment.

Regression analysis was conducted using SPSS Version 17. Correlation tests were also estimated using the same package. The results obtained are presented and discussed below. This section restricts itself to the overall model results.

Table 1: Descriptive Statistics of Major Variables in the Equation (2007-2009)

	Mean	Std. Deviation
Mobile Banking Customers	"5449225.00	1190964.466
Inflation Rate —	11.6200	1.70212
Savings	.14.8000	L50000
Investment -	3988000.0000	22000.00000

The average mean inflation rate is 11.62 % for 3 years. Savings has very low standard deviation hence indicates that most banks within 3 years had almost same savings with CBK. Mobile banking customers have an average of 5449225 people.

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Table 2: Regression coefficients for independent Variables

Model		Unstandardized Coefficients		Standardized Coefficients	Sig.
		B	Std. Error	Beta	
1	(Constant)	-127	24	-.276	.829
	Inflation Rate	578	39	.827	.381
	Savings		.000	.335	.021
	Investment	593	.000	.748	.000

a Dependent Variable: Mobile banking customers

Note: Use Standardized coefficients to formulate equation

Y=a+x1+x2+x3

Number of mobile banking customers =-.276+.827*inflation rate+.335*savings+.748*investment+24(Error)

Significant equation:

Number of mobile banking customers=.335*sayings+.748*investment

Since the P-values of savings and investment are less than 0.05.

Table 3: Correlations of major Variables

		Numbers Of Mobile Banking Customers	Inflation Rate	Savings	Investment
Pearson Correlation	Numbers Of mobile banking Customers	1.000	.827	.993	.968
	Inflation Rate	.827	1.000	.753	.658
	Savings	.993	.753	1.000	.991
	Investment	.968	.658	.991	1.000
Sig. (1-tailed)	Numbers Of mobile banking Customers	.	.190	.038	.081
	Inflation Rate	.190		.229	.271
	Savings	.038	.229		.043
	Investment	.081	.271	.043	

Independent variables are highly correlated with dependent variable i.e .827,.993 and .968.Savings have significant association with number of customers (p<.05).

4.2.2 Evolution of Mobile Banking and selected Macroeconomic Factors in Kenya

Graph 1: Scatter Diagram of Number of Mobile Customers Against Year

SCATTER PLOT OF CUSTOMERS

Numbers Of Mobile Banking4GAlfel§T YEAR


```
7000000  -i


6000000   •


5000000   -


4000000
          2006      2007      2008      2009      2010
```
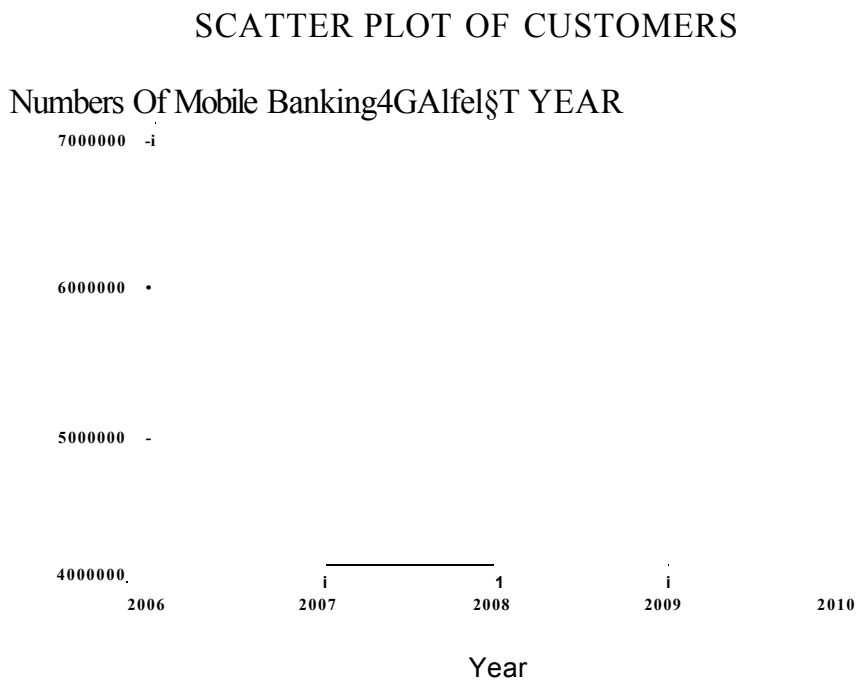
Year

Figure show no. of customers increase from year to year i.e. 2009 has above 6m mobile subscribers.

Graph 2: Scatter Diagram of Inflation Rate in Percentage Against Year

SCATTER PLOT OF INFLATION

AGAINST YEAR

```
13.5
Inflafifjn

12.5

12.0

11.5

11.0

10.5

10.0

 9.5
    2006        2007        2008        2009        2010
```

Year

Figure show Inflation rate increases from year 2007 to 2008 and decrease from 2008 to 2009.

Graph 3: Scatter Diagram of Savings Against Year

SCATTER PLOT OF SAVINGS

AGAINST YEAR

Savings

16 5	
16.	
15.5	
15.0	
14.5 -	
14.0 •	
13.5	
13.0	

2006   2007   2008   2009   2010
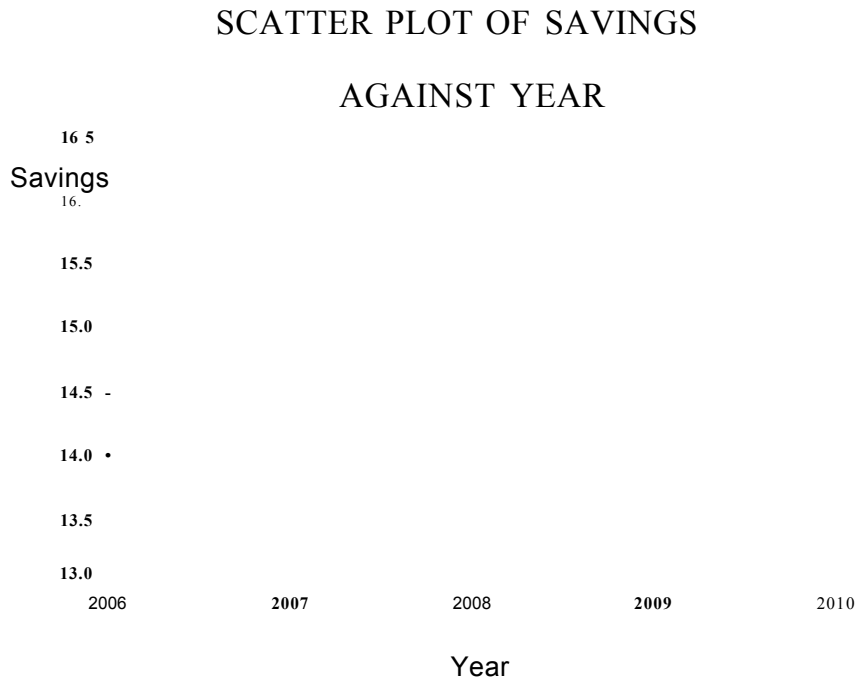
Year

Saving Rate grows from one year to next.

Graph 4: Scatter Diagram of Investment Against Year

SCATTER PLOT OF INVESTMENT

AGAINST YEAR

```
                    .
40200000


40100000   •
Investment


40000000   •


39900000   •                        .


39800000   •


39700000   -
39600000.   1                   .            1            1              .
          2006        2007          2008       2009         2010
```
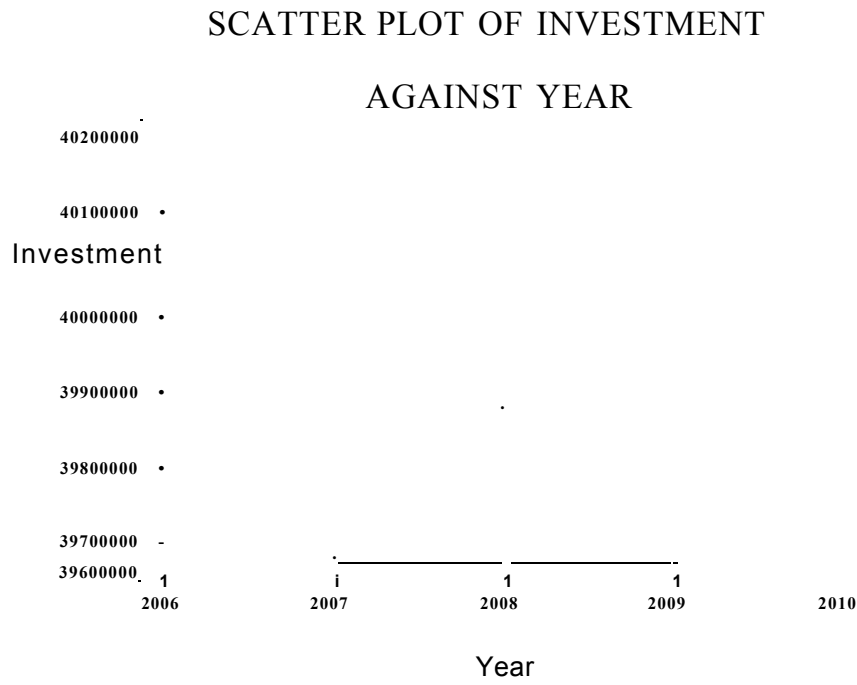
Year

Investments increases from year to next

27

4.2.3 Effect of Mobile banking On Selected Macroeconomic Factors

Graph 5: Scatter Plot of Mobile Customers Against Inflation, Savings and Investment.
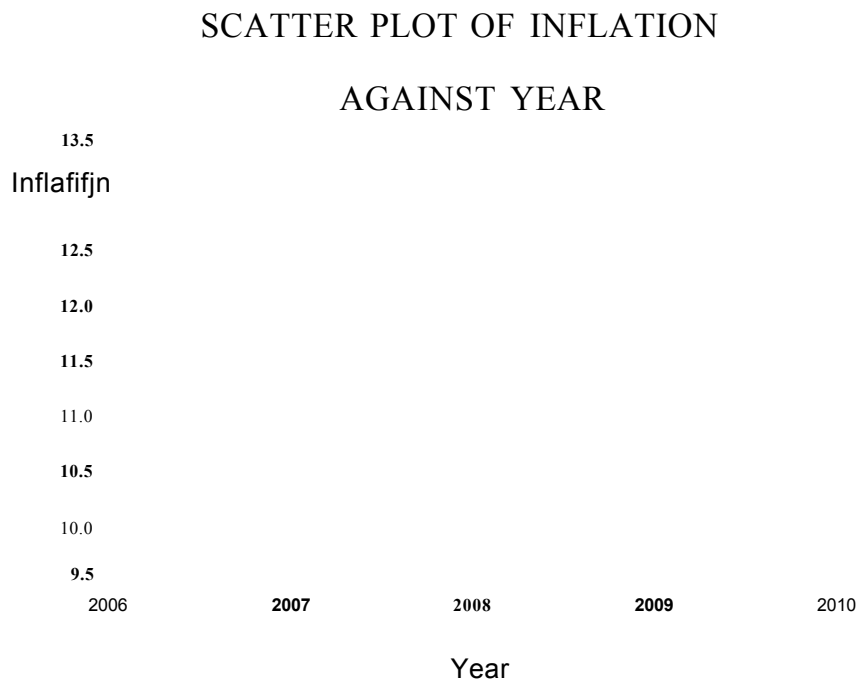
SCATTER PLOT OF INFLATION

AGAINST CUSTOMERS 2007-2009

Numbers of Mobile Banking Customers
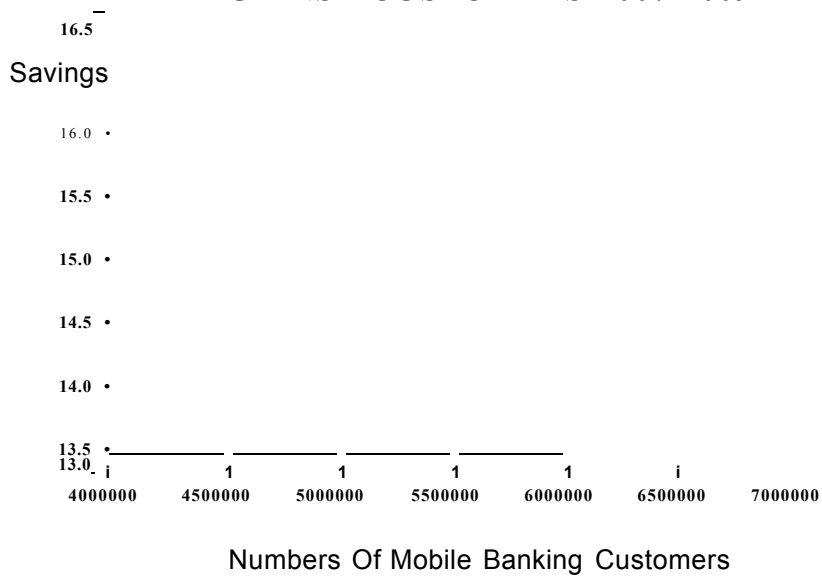
Shows as inflation decreases, number of mobile customers increases i.e. Inflation is inversely related to mobile banking customers

SCATTER PLOT OF SAVINGS

AGAINST CUSTOMERS 2007-2009

Savings

```
16.5

16.0  •

15.5  •

15.0  •

14.5  •

14.0  •

13.5  •
13.0
      i        1        1        1        1        i
   4000000  4500000  5000000  5500000  6000000  6500000  7000000
```

Numbers Of Mobile Banking Customers

Shows as number of customers increase over the years, so does savings i.e. they are positively correlated

SCATTER PLOT OFINVESTMENTS

AGAINST CUSTOMERS 2007-2009

immrnhv

```
4020000

4000000  •

3990000  •                                    .

3980000  •

3970000  •

3960000
     4000000   4500000   5000000   5500000   6000000   6500000   7000000
```
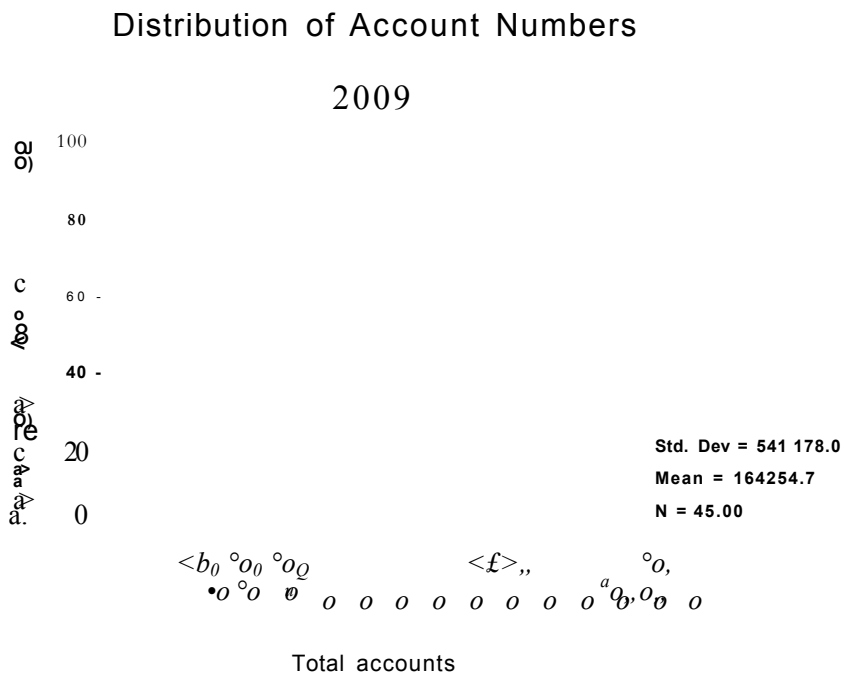
Numbers Of Mobile Banking Customers
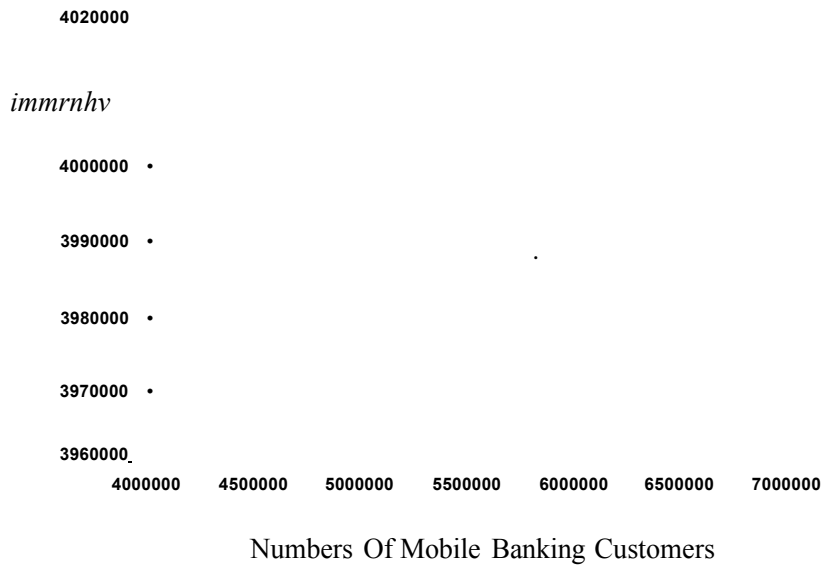
Shows investment increases with increase in mobile banking customers over the

Graph 6: Histogram of account numbers

Distribution of Account Numbers

2009

```
100

 80

 60 -

 40 -

 20                           Std. Dev = 541 178.0
                              Mean = 164254.7
  0                           N = 45.00
```

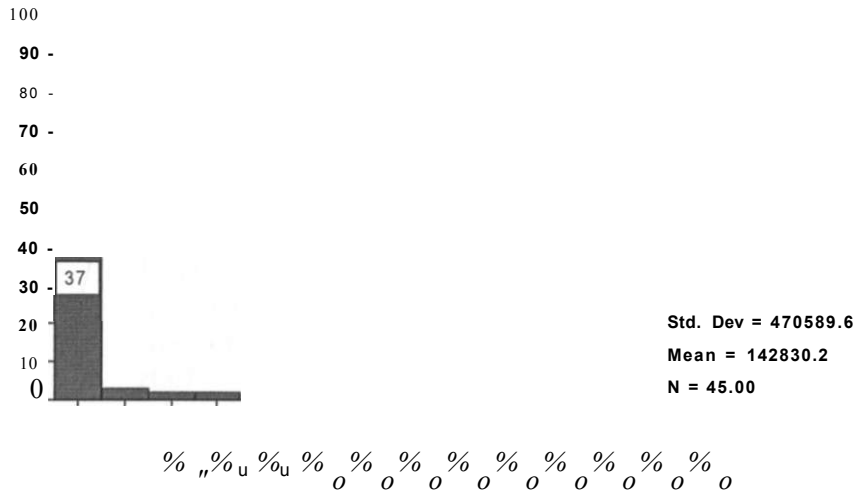$<b_0\ °o_0\ °o_Q$ $<£>,,$ $°o,$
•$o\ °o\ $ ʋ $o\ o\ o\ o\ o\ o\ o\ o\ ^a o,°o$ o

Total accounts

About 37% of accounts in the banks have less than 250000 account holders in the year 2009.Less than 20% had 3500000 accounts holders

DISTRIBUTION OF ACCOUNT NUMBERS

2008

Std. Dev = 470589.6
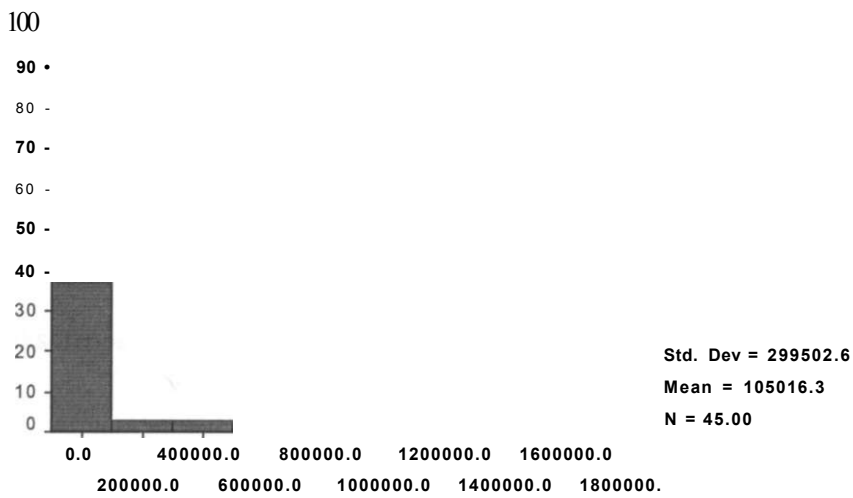
Mean = 142830.2

N = 45.00

Total Accounts Number 2008

37% of Banks had account numbers less than 250000 in 2008

DISTRIBUTION OF ACCOUNTS NUMBERS

2007

Std. Dev = 299502.6

Mean = 105016.3

N = 45.00

Total Accounts Number 2007

31

37% of Banks had acconnt numbers less than 200000 holders in 2007

Table 4: Coefficient for regression equation of 2007 and 2008 Accounts numbers.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	20756.478	9852.488		-2.10.7	.041
	Total Accounts Number 2007	1.558	.031	.991	49.680	.000

a Dependent Variable: Total Accounts Number 2008

Account number 2008=-20756.478+l .558 Account Number 2007
Deposit for 2007, 2008 and 2009: Amount in millions
Statistics

Table 5: Bank Deposits for 2007-2009

	Banks Deposits	Total Amount 2008	Total Amount 2007	Total Amount 2009
Mean	1.93	19596.23	18945.95	20967.96
Std. Error of Mean	.123	4362.151	4425.242	4667.502
Std. Deviation	.818	28935.239	29353.737	30960.706
Variance	.670	837248072.505	861641891.905	958565318.211

Banks deposits have very small variance hence most banks deposit almost same amount.
Average deposit of banks in 2008 was 19596.23 M.

Table 6: Banking Sector Deposits (2007-2009)

		Frequency	Percent	Cumulative Percent
Valid	Small	16	36.4	36.4
	Medium	15	34.1	70.5
	Large	13	29.5	100.0
	Total	44	100.0	

36.4% of deposits by the banks was very small i.e. less than or equal to 4000000.34.1% was for medium i.e.>4000000and<=20000000 and 29.5% was large i.e. >=20000000

Pie-chart of deposits for all banks in Kenya

BANKING SECTOR DEPOSITS
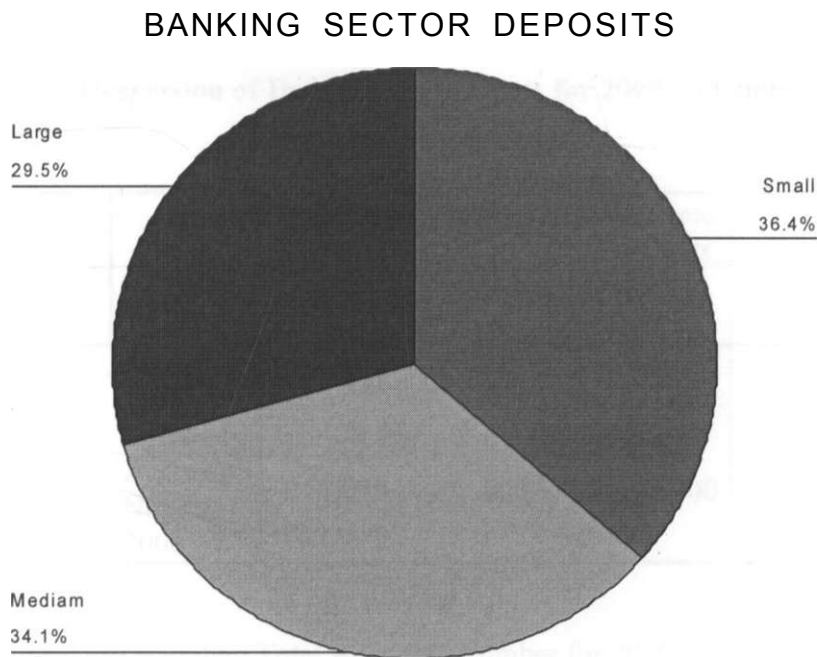
Large deposits are >20,000,000

Medium >4000000 and<=20000000

Small <=4000000

Table 7: Regression of Deposits Coefficients for 2008 and 2007

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	6186.697	3668.923		1.686	.099
	Total Accounts Number 2007	.708	.106	.718	6.685	.000

a Dependent Variable: Total Accounts Number 2008

Deposits 2008=6186.697+.708*deposits 2007+3668.923(error)

Table 8: Regression of Deposits Coefficients for 2009 and 2008

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.495	.000		.000	1.000
	Total Accounts Number 2008	1.070	.000	1.000	3.074	.000

a Dependent Variable: Total Accounts Number for 2009

Deposits 2009=1.495+1.070*deposits 2008

i.e. Deposit next year=l .495+1.070*previous year

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of findings and conclusions

The study set out to investigate the effect of mobile banking on selected macroeconomic factors in Kenya namely; Inflation. Savings and investment. The number of customers registered for the mobile banking service was regressed against the three variables for a period of 3 years.

Data was collected and findings indicated that on the overall model summary, the average inflation rate is 11.62% for the 3years.Savings had very low standard deviation hence indicates that most banks within three years had almost the same savings as Central Bank of Kenya and the average number of mobile customers was 544225 people.
On Evolution of mobile banking and selected macroeconomic factors in Kenya, findings show that with increased improvement and awareness of technology over the years that is from 2007-2009 so did the number of customers registered for the mobile banking service increase. Inflation rate increased from 2007 to 2008 but later decreased from 2008 to 2009.This was attributed to increased usage of mobile banking service. Investment on the other hand also increased from 2007 to 2009.

On effect of mobile banking on selected macroeconomic factors findings showed that as number of mobile customers increase so does savings and investment over the three year period showing that mobile banking is positively correlated to investment and savings. But inflation increases from 2007 to 2008 and decreases from 2008 to 2009; meaning it is inversely related to the number of mobile banking customers. A further look at savings based on account holders findings indicated that 37% of accounts had less than 250,000 account holders in the year 2009, less than 20% had 350,000 account holders. 37% of banks had account numbers less than 250,000 in 2008 and 37% of banks had account numbers less than 200,000 holders in 2007.This means with increase use of mobile

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banking over the years from 2007-2009 so did account holders increase which led to an increase in savings and investments in most banks and a decrease in inflation.

The findings are in line with those of Jamie Zimmerman (2010), where he was of the view that two years ago, mobile banking in the developing world was an object of skepticism among financial insiders. Many thought of mobile banking as a niche product that, at most, could maintain the loyalty of existing traditional bank customers, few imagined it might bring savings and liquidity to those who don't belong to the bank in the first place. The spontaneous and unplanned exploitation of m-banking in the developing world has gone well beyond expectations.

In conclusion with the improvement of mobile technologies and devices, banking users are able to conduct banking services at any place at any time. Recently, many banks in the world have provided mobile access to financial information. Understanding the various macroeconomic factors that contribute to user's intention to use mobile banking is an important issue in this research. Kenyan mobile banking sector presents a delightful outlook of exploitation. The demands of vibrant M-banking implementations revolve around improved network coverage, quality connections besides reduced costs to ensure affordability to all prospective partakers.o^ervice providers might be better of availing the service at lower costs to net more users rather than insisting on high levies which frighten off some possible participants. By so doing they will be able to boost their revenue streams by promoting the volume of transactions. On the policy front, there is an urgent need to device policies and strategies to reverse gaps in terms of investment, savings and rural - urban demographics. M-banking therefore has no direct impact on the selected macroeconomic factors in Kenya. That is independent variables have no significant association with the dependent variable.

5.2 Limitations of the study

The study was largely successful however some problems noted include; the fact that the data used for the study involved only commercial banks in Kenya, the study did not consider other financial providers like financial institutions in Kenya. The study only used

the multiple regression technique and did not consider other suitable techniques. The study considered selected macroeconomic factors in Kenya mainly savings, investment and inflation. Mobile banking is still a new technology getting literature material was also a difficult task hence heavy reliance on internet material. Also the number of years studied was three since it is a new technology. Time was also a constraint as a lot is expected within a short period of time.

5.3 Suggestions for Further Research

The study mainly focused on commercial banks in Kenya, the study did not consider a sample of other financial institutions in Kenya. The study also used regression analysis as the only technique, it did not consider use of other techniques like use of chi-square, Z-test, grouped data, frequency distribution etc. The study did not consider interaction between mobile banking and other macroeconomic factors such as employment, international trade.

I therefore suggest that a further research can be conducted in these areas as mobile banking still remains a relatively new area that is largely unexploited.

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APPENDICES

Appendix A: List of Commercial Banks in Kenya

1. African Banking Cooperation
2. Bank of Africa
3. BankOfBaroda
4. Bank Of India
5. Barclays Bank
6. CFC Stanbic Bank
7. Charterhouse Bank
8. Chase Bank
9. City Bank N.A
10. City Finance Bank Ltd
11. Commercial Bank of Kenya
12. Consolidated Bank
13. Cooperative Bank
14. Credit Bank
15. Development Bank of Kenya
16. Diamond Trust Bank
17. Dubai Bank(K)
18. Eco Bank
19. Equatorial Commercial
20. Equity Banks ltd
21. Family Bank
22. Fidelity Commercial Bank
23. Fina Bank
24. First Community Bank
25. Giro Commercial Bank
26. Guardian Bank
27. Gulf African Bank
28. Habib Bank
29. Habib Bank AG Zurich
30. Housing Finance Co. of Kenya
31. I&M
32. Imperial Bank
33. K-Rep Bank Ltd
34. Kenya Commercial Bank
35. Middle East Bank(K) Ltd
36. National Bank
37. National Industrial Credit
38. Oriental Commercial Bank
39. Paramount Universal Bank
40. Prime Bank
41. Southern Credit Banking Corporation Ltd

42. Standard Chartered Bank
43. Transnational Bank
44. Victoria Commercial Bank