EFFECT OF MOBILE BANKING ON FINANCIAL PERFORMANCE OF SAVINGS AND CREDIT CO-OPERATIVE SOCIETIES IN NAKURU CENTRAL BUSINESS DISTRICT, KENYA

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A Research Project Submitted to the School of Business and Economics in Partial Fulfillment of the requirement for the award of Master of Business Administration (Accounting Option), Kabarak University

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DECLARATION AND APPROVAL

Declaration

I declare that this research project is my original work and has not been presented to any other examination body of higher learning institution. Therefore, No part of this work should be reproduced without my consent or that of Kabarak University.

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DEDICATION

This research project is dedicated to my parents; Simon Sigilai and Grace Sigilai, who have committed to give us good education and have always encouraged and supported me to be the best that I can be. To my siblings, Hillary Langat, Johnstone Ruto, Amos Langat, and Purity Chelang'at, who challenge and inspired me to grow and be a better person. I am also indebted for the great support of David Keter, Joshua Mutai and Chepkorir Winnie who have always stood with me throughout my academic journey. I treasure you all for your contributions.

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ABSTRACT

In keeping with the advancement in technology, savings and credit cooperative societies have in the recent past undergone major technological leaps in the provision of banking services by adoption of mobile banking technology. This model of banking was particularly useful in providing efficiency and accessibility of banking services without the barriers of location and time. Many studies have been done to assess the effect of mobile banking on financial inclusion but not many studies have been carried out in the Kenyan banking sector in respect of the effect of mobile banking on performance of savings and credit cooperative societies (SACCOs). This research sought to study the effect of mobile banking on financial performance of SACCOs in Nakuru Central business district, Kenya. The study adopted descriptive research design. A census survey was carried out to all the 11 SACCOs licensed by Sacco Societies Regulatory Authority since their total population was small. From each SACCO, the Manager, Finance Officer, Mobile Banking Officer, Information Technology Officer, Loans Officer, Customer Service Officer and Operations Officer were issued with questionnaires on a drop and pick later basis. Out of the 77 questionnaires issued, a total of 66 were returned. Data collected was cleaned, coded, keyed and analyzed quantitatively using descriptive statistics. The data was analyzed using mean, figures, standard deviation and frequency tables. The study was guided by modern economics theory, financial intermediation theory and innovative diffusion theories. From the research findings, the study found that on average, the amount of mobile banking transactions have increased steadily from the period 2010 to 2015. The growth was found to have been motivated by the convenience offered by the mobile banking service. The study variables further revealed that there is a positive relationship between mobile banking and the financial performance of SACCOs. The findings further indicated that majority of the respondents were significantly (strongly agreed and agreed) ($\chi^2 = 31.6, P \leq 0.001$) with the mobile banking that it has led to increased financial performance. The study recommends that all the SACCOs need to provide as many mobile banking services. This was because of the direct relationship of mobile banking and the financial performance especially as the industry moves into a technologically competitive environment. The study also recommends that policy makers keep a keen eye on the developments of mobile banking as it is a new platform which offers financial opportunity for SACCOs as the world moves into a digital age to ensure it does not lose its regulatory role.

Keywords: *Mobile Banking, Transactions volume, Products, Technology, Security, Financial performance, Savings and credit cooperative societies*

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LIST OF ACRONYMS AND ABBREVIATIONS

ATMs - Automated Teller Machines

Av. A/c Turnover - Average Accounts Turnover

CBD – Central Business District

CBK - Central Bank of Kenya

FOSA - Front Office Societies Activity

ICT - Information Communication Technology

NPLs - Non-performing loans

ROA - Return on Assets

ROCE - Return on capital employed

ROI - Return on Investment

SACCOs - Savings and credit cooperative societies

SASRA - Sacco Societies Regulatory Authority

SPSS - Statistical Package for Social Sciences

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The proliferation and rapid advances in technology-based systems, especially those related to mobile services, have led to the fundamental changes in how companies interact with customers (Reid, O'donnell & Downey, 2006). The banking industry has been on the lead in the increasing trend of investing in technology and automating various operations to avail banking services to their customers within the shortest time possible. The challenging business environment in the financial and banking industry in Kenya has resulted to more pressure for savings and credit cooperative societies (SACCOs) to develop and utilize alternative delivery channels. Therefore, it has led to the trend towards adoption of mobile banking operations by SACCOs in Kenya. This is aimed at improving service delivery, minimizing operational costs, and time. Sethuraman & Parasuraman (2005) posit that these channels have led to improved customer perceptions, therefore, encouraging their loyalty and hence retaining them.

As financial intermediaries, savings and credit cooperative societies channel savings into loans providing saving opportunities for the poor especially in the rural areas. They are the major players in the financial sector managing to mobilize over Kshs.700 billion, which is approximately 41% of the total national savings (Okibo & Wario, 2014). Over 81% of Kenyans rely on SACCOs to access financial services, making SACCOs a critical player in the financial sector in Kenya (Nyandika, 2014). Savings and credit cooperative societies however have grown faster than other co-operatives since the enactment of the SACCO Societies Act 2008 which places the licensing, regulation and supervision of deposit taking under the armpit of the Sacco Societies Regulatory Authority. The number of registered savings and credit cooperative societies in Kenya was 15,007 as at December 2015.

According to Bowton, et. al., (2014), 49% of these savings and credit cooperative societies are active and have filed their duly audited accounts with the commissioner for co-operatives. The number includes both deposit taking that is, SACCOs operating front office services activity (FOSA) and non-deposit taking savings and credit cooperative societies. The estimated proportion of both deposit taking and non-deposit taking savings and credit cooperative societies

are 7% and 93% respectively (Magara, 2013). As a result of globalization, liberalization and scientific development, savings and credit cooperative societies like any other institutions have been facing numerous challenges. These challenges have made them to hunt for appropriate strategies to improve their development and survival. Therefore, mobile banking has become one of key strategies used in the banking industry around the globe (Kopala, 2010).

According to Argamo (2015), the growth of information technology has affected almost each aspect of life among them being the banking industry. The coming up of mobile banking has shaped the way savings and credit cooperative societies are now being operated. Since technology is now regarded as the major input for the institutions' achievement and as their main proficiencies, savings and credit cooperative societies have started channeling their finances more on offering clients with fresh technologies by means of mobile banking.

According to Kauffman & Riggins (2012), technological development has not only influenced lifestyle but has had an effect on the way clients do their banking. In the recent days, savings and credit cooperative societies started making use of mobile vehicles to take services to their clients particularly those in rural areas. Thereafter, they shifted to making use of the e-mail as well as internet services to offer services to their clients. The last decade has witness unbelievable expansion in mobile growth especially in developing countries (Argamo, 2015).

Nevertheless, of great significance is that whereas mobile phone provides a number of features such as the likelihood of mobile banking, approximately half of the global population has not accepted mobile banking and monetary services (Njeru & Makau, 2014). Developing countries like Kenya have been increasingly adopting branchless banking as a way of providing banking services to numerous unreached populations particularly low-income families (Lomosi, 2015). Revolutionary SACCOs, microfinance firms and mobile operators began experimenting on agency banking networks in different states around the globe in the 20th century. The development of agent banking is apparent in numerous states all over the world, for example; in Australia, post offices operate as SACCO agents whereas France utilized corner stores while Brazil used lottery outlets to offer financial services (Chaiken, et. al., 2008).

According to Kamau (2011), over 7 million mature Kenyans from the rural setting are either not banked or they are under-banked. This is partially as a result of the huge cost of sustaining the

branches of the SACCO due to low turnover of business operations in rural areas. This condition makes development of fresh branches in the rural setting a less productive undertaking. McKay & Pickens (2010) posits that the most current information available shows that only 25% of mature Kenyans indicated having accessibility to office controlled financial firms whereas more than a third (40%) have no accessibility to the most elementary form of unofficial financial service. This leaves a fraction of over 80% outside the reach of conventional banking.

Foster & Magdoff, (2009) found that unexpressed demand for a reasonably priced and dependable way of holding finances while making sure that threat levels are consigned to the lowest level is constantly unfolding. A structure with the potential to eliminate the historical impediments of cost and free accessibility which have for long hindered clients of banking services suggests immediate consideration and interest. In Kenya, the execution of agent banking services is evidence to this reality (Lomosi, 2015).

Mobile technology has significantly penetrated to the rural areas in Kenya and is expected to be on an increasing trend in the coming years. Savings and credit cooperative societies and other financial institutions which have conventionally depended on physically setting up of branches to offer banking services are now moving towards taking up of mobile banking services as a structure of branchless banking. This has the effect of reducing banking costs hence technology has thus offer huge openings to service providers to provide the clients with timely and flexible services. Ultimately, Savings and credit cooperative societies have adopted branchless banking like internet banking, mobile banking and Automatic Teller Machines among others (Kariuki, 2015).

1.2 Statement of the problem

In as much as technology becomes the order of the day and new development in the economy creates new opportunities that are hard to assume, many organizations are looking for ways on how to embrace technology as a way of survival. Mobile banking services can be used to raise efficiency and boost business growth through economical, efficient and reliable money service support systems that reduce the need for cash transaction and the associated risks (Sarkar, et. at., 1995). The benefits of cashless transactions include less opportunity for fraudulent and criminal activities, complete transparency on all transactions, reduced queue times at vendor booths, high

speed connectivity allowing faster transactions times, elimination of cash and currency costs, clean and simple account reconciliation for all vendors, and mobile money technology has increased adoption rates amongst others (Mbogo, 2010).

According to Ling & Donner (2013), introduction of Mobile banking Services draws upon the successful marriage of two fundamentally different technological platforms; banking and mobile telephone. Savings and credit co-operative societies are entering into partnership with companies that provide utility service, mobile service operators, with the aim of providing Mobile banking services. Mishra & Bisht (2013) argued that these services have seen an unprecedented development and growth during the last few years and it is becoming a major catalyst for economic and social development in many countries, Kenya included.

According to Tiwari, et. al., (2009), savings and credit cooperative societies in Kenya have continued to deploy huge investments in mobile banking services since the introduction of mobile banking in 2007. At the same time improved financial performance in comparison to previous periods has been the trend by these SACCOs yet there are limited studies focusing on the effect of Mobile Banking on financial performance of savings and credit cooperative societies in Kenya. Nevertheless, Donovan (2012) argued that more SACCOs are currently launching newer and newer mobile banking platforms. However, according to Demombynes & Thegeya (2012), most of the SACCO members in Kenya are still without effective access to mobile banking services and this may have affected the financial performance of the savings and credit cooperative societies. Therefore, the study sought to fill this knowledge gap by establishing the effect of Mobile banking on financial performance of SACCOs in Nakuru CBD.

1.3 Research Objectives

1.3.1 General Objective

The main objective of the study was to examine the effect of mobile banking on financial performance of SACCOs within Nakuru CBD.

1.3.2 Specific Objectives

The following were the specific objectives that the research sought to address;

i. To examine the effect of mobile banking transaction volumes on financial performance of SACCOs in Nakuru CBD.

ii. To evaluate the effect of mobile banking products on financial performance of SACCOs in Nakuru CBD.
iii. To examine the effect of mobile banking security on financial performance of SACCOs in Nakuru CBD.
iv. To investigate the effect of mobile banking technology on financial performance of SACCOs in Nakuru CBD.

1.4 Research Questions

The researcher sought to answer the following research questions;

i. What effect does mobile banking transaction volumes have on financial performance of SACCOs in Nakuru CBD?
ii. Do mobile banking products have any effect on financial performance of SACCOs in Nakuru CBD?
iii. What is the effect of mobile banking security on the financial performance of SACCOs in Nakuru CBD?
iv. What is the effect of mobile banking technology on the financial performance of SACCOs in Nakuru CBD?

1.5 Significance of the study

This study will be of significance to different stakeholders in the following fields;

This research will inform the management of saving and credit cooperative societies on financial effect of mobile banking on the financial performance of their institutions. Therefore through the findings of this research, the management will be able to strategize on how to realize maximum benefits from mobile banking services. The findings of this study will be important to the policy makers and agencies like the Central Bank of Kenya in informing policy formulation especially with regard to regulating mobile banking services in Kenya. The research findings will add a dimension that will help to improve policy direction with regard to regulation of mobile banking as well as factors that spur economic growth. This study will help both academicians and accounting students built their knowledge based on the discipline by adding on the existing literature on mobile banking and financial performance of savings and credit cooperative societies.

1.6 Limitations and Delimitations of the study

The research focused only on the effect of mobile banking on the financial performance of savings and credit cooperative societies. However, there were other institutions in the economy which experienced the effect of mobile banking for example insurance companies though the study did not cover them. The study also was faced with the challenged of not finding all respondents in time of the study due to them being too busy with the organization work. The researcher nevertheless made an appropriate time table with the top savings and credit cooperative societies' managers that suited all the respondents during the process of data collection for reliable and valid information.

1.7 Scope of the Study

The study sought to examine the effect of mobile banking on financial performance of savings and credit cooperatives societies regulated by Sacco Societies Regulatory Authority within Nakuru CBD. The target population comprised of all the 11 regulated savings and credit cooperative societies operating in Nakuru CBD. From each of the savings and credit cooperative societies, Managers, Finance officers, Mobile Banking officers, Information Communication Technology officers, Operations officers, Customer service officers and Loans officers were issued with a questionnaire to fill. Therefore, the sample size was 77 respondents. The research was carried out for the period 2010-2015.

1.8 Operational Definition of Terms

In this research, the following terms were used according to the definitions given below:

Financial performance indicates a measure of how well a organization use their assets from its primary mode of business to generate revenues. It measures the financial health of an organisation. The common indicators of financial performance are profits, return on investment, return on assets, value added and margins among others. Financial performance guides management on the strategies and policies to adopt to improve sustainability of the organisation (Almazari, 2011).

Mobile banking is a system that allows Savings and Credit Co-operatives Societies' customers to conduct a number of financial transactions through a mobile device such as a mobile phone (Darrat, 1999).

Mobile Banking Products refer to a set of applications that enable people to use their mobile telephones to manipulate their accounts, store value in an account linked to their handsets, transfer funds and even access credit products (Mishra & Bisht, 2013).

Mobile Banking Security refers to the security controls and measures that the underlying threats could compromise the confidentiality, integrity and availability of mobile security assets (Zissis, & Lekkas, 2012).

Mobile Banking Technology refers to the financial transactions undertaken by savings and credit cooperative society customers' using their mobile devices such as mobile phones to sent money, withdraw cash, and even make payments for their products or services (Anyasi & Otubu, 2009).

Mobile Banking Transaction Volume refers to a measure of the number of transactions processing requests that savings and credit cooperative society will receive and respond to within a specified period of time (Ondrus, & Pigneur, 2005, January)

Savings and Credit Co-operatives Societies refers to an autonomous association of persons united voluntarily to meet their common economic, social, and cultural needs and aspirations through a jointly owned and democratically controlled enterprise and are registered with the Department of co-operatives (Odhiambo, 2011).

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviewed literature on the effect of mobile banking to the financial performance of saving and credit cooperative societies in Kenya. Specifically, the chapter addressed the following; theoretical framework guiding the study, empirical review, conceptual framework and finally chapter summary.

2.2 Theoretical framework

2.2.1 Modern Economics Theory

Modern economics has gone far in discovering the various pathways through which millions of expectations of, and decisions by, individuals can give rise to emergent features of communities and societies like rate of inflation, productivity gains, level of national income, prices, stocks of various types of capital, cultural values, and social norms. However, two factors make this economic theory particularly difficult (Al-Jabri & Sohail, 2012). Among them is where an individual decision themselves are influenced by the emergent features, for instance, past decisions learning, practice, habit, and future expectations. There is also an emergent feature that can be well handled by existing economic theory and policy concern only through fast-moving variables.

According to Tiwari, et. al., (2006), modern economists have argued that success in achieving financial returns from fast dynamics leads to slowly emergent changes that can ultimately trigger sudden crisis and surprise. But the complexities that arise are such that most modern economists are frustrated in their attempts to understand the interactions between fast- and slow-moving emergent features. Through the application of modern economics theory, the researcher sought to bring the discussion to the management information systems in order to study how various mobile banking transaction volume affects financial performance of savings and credit cooperative societies.

2.2.2 Financial Intermediation Theory

Financial intermediation is a process which encompasses surplus units depositing finances with financial institutions who then lend to the shortage units. Oromo (2015) identified that financial

intermediaries can be distinguished by four criteria which includes their main categories of liabilities which are not related to performance of a portfolio. These payments are usually short-term and of a much shorter term than their assets. The high ratios of these liabilities are chequeable which can be withdrawn on demand and their liabilities and assets are basically not transferable. The most crucial contribution of intermediary, nonetheless, is a steady flow of funds from surplus to deficit units.

Diamond & Rajan (2001, June) analyses the provision of liquidity that is transformation of illiquid assets into liquid liabilities by savings and credit cooperative societies. In their model, identical investors are risk averse and uncertain about the timing of their future consumption's need without an intermediary, however, all investors are locked into illiquid long-term investments that yield high payoffs to those who consume later.

According to Scholtens & van (2003), the task of financial intermediary is fundamentally seen as that of creating specific financial commodities. These commodities are generated whenever an intermediary discovers that it can sell them for prices which are projected to cover all costs of their production, both direct costs and opportunity costs. Financial intermediaries, therefore, happen due to market imperfections. As such, in a 'perfect' market condition, with no transaction or information costs, financial intermediaries would not exist.

In financial markets, information asymmetries are exclusively pronounced. Borrowers usually know their security, industriousness, and moral integrity better than do lenders. On the other hand, entrepreneurs possess inside information about their own projects for which they seek financing (Chan, et. al., 1986). Moral hazard hampers the transfer of information between market participants, which is an important factor for projects of good quality to be financed. Therefore, financial intermediation theory sought to bring the discussion to the financial systems hence studying how various mobile banking affects the financial performance of the savings and credit cooperative societies.

2.2.3 Innovation Diffusion Theory

Bradley and Stewart introduced this theory in 2002 and it affirms that firms do engage in diffusion of innovation in order to gain competitive advantage, reduce costs and protect their strategic positions. The innovation diffusion theory put forward by Rogers in 1962 is a well-

known theory that explains how an innovation diffused among users over time (Wright, et. al., 2009). It also helps to understand customers' behavior in adoption or non-adoption of an innovation (Dineshwar & Steven, 2013, February; Gu, et. al., 2009). This theory depicts that adopters of any innovation follow a bell-shape distribution curve that have five parts to categorize users in terms of innovativeness (Collins, et. al., 2010). Rogers classified users as innovators, early adopters, early majority, late majority and laggards (Yang, et. al., 2009, June).

The adoption of mobile banking has the potential of extending the limited nature and reach of the formal financial sector to the poor and rural population in Africa. Most of the existing literature is nonetheless from the developed countries with few scholarly studies emerging (Mas & Morawczynski, 2009). Although most of the studies from the practitioners are not peer reviewed, they provide valuable information on actual usage and appropriate information on the development of the phenomenal. For example, Ivatury & Pickens (2006) provided valuable insight into the characteristics of the early adopters of Wizzit, one of the first major initiatives dedicated to offering mobile banking to the vulnerable people in South Africa.

By applying innovation diffusion theory to the adoption of transformational mobile banking services, the study aimed at bringing the discussion to the mainstream of information systems literature. This theory was therefore used to study how various new mobile banking products affect financial performance of savings and credit cooperative societies.

2.3 Concepts of Mobile Banking and Financial Performance of SACCOs

2.3.1 Mobile Banking

Mobile banking is a service offered by financial organizations in cooperation with mobile phone operators. It allows clients to conveniently do their banking using their mobile phones anytime. It is therefore getting banking services to unbanked and those who are at the bottom of the economic pyramid and often living in remote areas. These services comprise the benefits of banking services such as being capable to save and borrow in a cost-efficient and secured way. These services comprise opening accounts, viewing account balances, cash withdrawals and deposits, making cash transfers between accounts, paying bills via a mobile device among others (Salzaman et. at., 2001).

In recent years, saving and credit cooperative societies, payment system providers and mobile operators have begun experimenting with branchless banking models which has significantly reduced operating costs by taking small value transactions out of the banking halls into local retail shops. For example, agents such as airtime vendors, gas stations, and shopkeepers, register new accounts, accept client deposits, process transfers, and issue withdrawals using a client's mobile phone to communicate transaction information back to the telecommunication provider and the cooperative society. This enabled clients to send and receive electronic money whenever they have cell coverage without the need for them to visit a retail agent except only for transactions that involved depositing and withdrawing cash (Wambari, 2009).

In search of competitive pros in technological financial service industry, savings and credit cooperative societies have acknowledged value and distinguish themselves from others financial organizations through new service distribution channels (Kolodinsky, et. al., 2004). The rigid process of opening an account with a SACCO has cut out several poor people in rural areas as they could not qualify to register an account due to them not being able to meet the minimum threshold amount that is required to deposit into their accounts in order for that account to be activated. Mobile banking provides a number of advantages for both savings and credit cooperative societies and customers as it eliminates geographical weakness to customers. This therefore helps to bring convenience thus banking maybe performed anywhere, anytime and in any place. It also provides efficient cash management and security of cash.

2.3.1.1 Mobile Banking Transaction Volumes

In recent years, savings and credit cooperative societies, payment system providers and mobile operators have begun experimenting with branchless banking models which have reduced their operating costs by taking small value transactions out of the banking halls into local retail shops. For example, agents such as airtime vendors, gas stations and shopkeepers, register new accounts, accept client deposits, process transfers, and issue withdrawals using a client's mobile phone then communicate transaction information back to the telecommunication provider and the cooperative society. This has facilitated clients to send and receive electronic money wherever they have cell coverage. However, they are only needed to visit a retail agent for transactions that involve depositing or withdrawing cash (Wambari, 2009). The researcher, therefore, collected data on the frequency of mobile banking transactions undertaken by

SACCOs and investigate their effect on financial performance of these savings and credit cooperative societies.

2.3.1.2 Mobile Banking products

Mobile Banking products refer jointly to a set of applications that enable people to use their mobile telephones to manipulation their accounts, store value in an account joined to their handsets, transfer funds and even access credit products. These products have improved accessibility to financial service in both developed and developing world. The first target for these applications was consumers in the developed world.

By complementing services offered by the banking system such as cheque books, ATMs, Voice mail/landline interfaces, smart cards, point of sale networks and internet resources, mobile platform presents a convenient supplementary method for managing money without handling cash (Laukkanen & Lauronen, 2005). The M-Pesa has compelled money transfer companies to lower prices. It has furthermore induced these firms and other financial firms to improve their products and services. In cases, firms have work in partnership with M-Pesa to offer integrated services (Barrett, et. al., 2015). This study therefore considered data on existence of various mobile banking products to determine whether it has influenced the financial performance of savings and credit cooperative societies in Nakuru CBD.

2.3.1.3 Mobile Banking Technology

Technology is being used by businesses today to enhance growth and competitiveness (Anyasi & Otubu, 2009). Savings and credit cooperative societies are developing fresh and innovative products to be proficient to maintain existing customers and to attract fresh markets. One such innovation is the introduction of mobile banking technology in the banking sector. Mobile banking has transformed the way savings and credit cooperative societies perform their operations. For instance, it has led to the introduction of new products and services that are aimed at reducing transaction costs and reaching a larger number of clients (Suoranta & Mattila, 2004; Anyasi et. al., 2009; Oluoch & Mwangi, 2012).

Mobile banking provides the ability of increasing efficiency of mobile payments system and enlarging access to formal financial services by those who at the moment lack it. At the same time, it could make banking more suitable and cheaper to those who already have SACCO

accounts (Donner, 2007, May). It is clear that Mobile banking technology will make Kenya realize its vision of guaranteeing high levels of savings to finance its overall investment needs (Wamuyu & Maharaj, 2011).

Donner (2007, May) argues that mobile banking technology refers to financial operations undertaken using mobile appliances such as mobile phones. To improve financial performance, many firms in Kenya have executed mobile banking technology hence customers can now use their mobile telecommunications gadgets to make sent money, withdraw cash, and even make payments for their products or services. This application saves customers' time and cost it would have consumed them to travel to the SACCOs to make payments. This system furthermore aims at reducing transaction costs and increasing the speed and reliability of transactions. Malando (2015) also argued that, with the realization of mobile channels in the retail payments area, the use of paper-based payment methods will decrease further in the future.

Although several savings and credit cooperative societies in Kenya have implemented mobile banking technology, little research have been carried out on the effect of this technology with regards to financial performance of savings and credit cooperative societies. Furthermore, numerous scholars in the developed countries uncovered that mobile banking technology still remain at infancy stage (Cheah, Teo, et al., 2011). Therefore, this research aimed at establishing whether mobile banking technology have any effect on the financial performance of savings and credit cooperative societies in Nakuru CBD.

2.3.1.4 Mobile Banking Security

According to Ling & Donner (2013), mobile transactions have increased over 200% in the last two years with billions of shillings of saving and credit cooperative societies' transactions being effected on mobile devices. This has not gone unobserved by cybercriminals, and mobile fraud is swiftly on the rise (He, 2013). Interest in the adoption and use of biometrics, especially for consumer authentication has developed as a result. However, delivering financial services over mobile networks is bringing about a fundamental shift in the financial services industry.

According to Heikki et. al., (2002), the conversion from the traditional banking towards mobile banking has been a 'leap' change. The increase in information access terminals along with the increasing use of information sensitive applications such as mobile banking has created a real

requirement of reliable, easy to use, and generally satisfactory control methods for confidential and vital information. On the other hand, the stipulation for privacy must be equalized with security requirements for the benefit of the public. Mobile payment systems are undergoing fundamental changes stirred largely by technical advancement such as real-time processing and online consumers' tendency to use mobile banking interfaces. Therefore, this study aimed at examining whether mobile banking security has any effect on financial performance of savings and credit cooperative societies in Nakuru CBD.

2.3.2 Financial Performance

Financial performance is a multidimensional paradigm that consists of four components (Daud, et. al., 2011). These components involved customer-focused performance which involves customer satisfaction, product and service performance; financial and market performance in terms of revenue, profits, market position, cash-to-cash cycle time, and earnings per share; Human resource performance for instance employee satisfaction and lastly, organizational value which include time to market, level of innovation, and production and supply chain flexibility.

Coherent with the theoretical foundations in the capabilities and resource-based perspectives, it can be argued that organizational abilities are rent creating assets. They allow firms to earn above-normal returns. For example, performance management capability influences various measures of firm performance by allowing business managers to review and take corrective actions in a timely manner (Brissimis, et. al., 2008).

According to Ismail & Rashid (2013), abundant of the current SACCO performance literature describes the objective of financial societies as earning acceptable returns and minimizing the risks taken to earn this return. There is a commonly accepted relationship between risk and return, that is, the higher the risk the higher the projected return. Therefore, traditional measures of SACCO performance have to quantify both risks and returns using the standard deviation.

The growing competition in the national and international banking markets, the switch towards monetary unions and the new technological innovations herald key changes in banking environment and hence challenge all savings and credit cooperative societies to make appropriate measures in order to enter into a new competitive financial environment. Muchangi (2014)

investigated the effectiveness of Nigerian SACCOs based on their political union and found that political factors were the key determinant of the performance of Nigerian SACCOs.

Financial performance of savings and credit cooperative societies are often stated as a function of internal and external determinants. The internal determinants start from SACCO accounts whereas external determinants are variables that are not connected to SACCO management but reflect both the economic and legal environments that affect the operation and performance of the financial organizations. However, a number of descriptive variables have been proposed for both categories according to the nature and purpose of each study (Daud, et. al., 2011). These internal determinants of financial performance take on variables such as size, capital, human resource and innovativeness while external determinants consist of factors such as inflation, interest rates and recurrent output, and variables that represent market characteristics (Daud, et. al., 2011). The last refer to market concentration, industry size and ownership status of the savings and credit cooperative societies.

De Gregorio & Guidotti, (1995), argued that financial performance is a subjective degree of how well an organization can locate their assets from its primary mode of business to create revenues. This term is also used as a general measure of a firm's overall financial strength over a given period of time and can be used to connect similar firms throughout the same industry in order to link industries and sectors in aggregation. There are different ways of assessing financial performance but all measures should be taken in accumulation. For example, line items such as revenue from operations, operating income and cash flow from operations can be used, as well as total unit sales (Thulani, et. al., 2009).

Profit is the fundamental goal of majority of the firms (Moore, 2000). Hence, to measure profitability of the savings and credit cooperative societies, there are types of proportions which are used of which Return on Equity, Return on Asset, Average accounts turnover and Return on Capital Employed are the most important ones (Momanyi, 2015).

2.3.2.1 Return on Equity

Return on equity is a financial quotient that refers to how much profit a business earned compare to the total amount of shareholder equity invested. Return on equity is basically what shareholders get in return for their investment. A business that has a high return on equity is

more probable to be one that is capable of producing cash internally. Thus, the higher the return on equity the better the company is in terms of profit generation. It was supplementary explained by Khrawish & Al-Sa'di (2011) that return on equity is the proportion of net income after taxes divided and the total equity capital. It represents the rate of return gained on the funds invested in the SACCO by its stockholders. Return on equity reveals how effectively SACCO management is using shareholders' funds. Thus, it can be deduced from the above statement that if the return on equity is high, then it shows that the management is effective in utilizing the shareholders capital.

2.3.2.2 Return on Asset

Return on asset which is occasionally referred to as return on investment is an indicator of how profitable a company is comparative to its total asset. Return on Asset gives an impression as to how efficient management is at using its assets to generate earnings. Therefore, return on asset can be defined as a financial proportion that indicates the profitability of savings and credit cooperative societies. It is a proportion of income to its total asset (Khrawish, et. al., 2011). It measures the ability of the SACCO management to produce income by utilizing company assets at their disposal.

In other words, it shows how economically the resources of the business are used to generate the income. It further indicates the proficiency of the management of a firm in generating net income from all the assets of the institution. Laforet & Li (2005) stated that a higher return on asset indicates that the firm is more competent in using its resources. Therefore, if mobile banking services leads to an increases returns of the SACCO then the management should invest more assets in order to ensure efficient utilization of the mobile banking resources.

2.3.2.3 Average Accounts Turnover

Turnover is an accounting phrase that is used while evaluating how quickly a business accumulates cash from accounts receivable and how quick the business sells its inventory (Gregson, 1992). In the investment industry, turnover represents the ratio of a portfolio that is traded in a particular month or year. A quick turnover rate generates more commissions for trades positioned by a broker. Thus, turnover is meant to adjust for the inflows and outflows of cash and report on the level of transaction movement in the account.

For the purpose of this study, an average account turnover (Av. A/c Turnover) refer to the total amount of transactions made by customers using mobile banking applications during a given period of time over the total number of customers registered for mobile banking services. This will show the average transactions volume made through by SACCO customers using their mobile phone applications to transact. Frequency of use of an account leads to increase transaction costs; therefore, financial performance of the SACCO will be expected to grow at the same margin (Kilonzi, 2012). If on average, the number of SACCO customers registered to the mobile banking services turn to be low, then, it implied that the financial performance of the SACCO was not favourable.

2.3.2.4 Return on Capital Employed

Return on capital employed (ROCE) is the ratio of net operating profit of a company to its capital employed. It measures the profitability of a business by expressing its operating profit as a proportion of its capital employed (Reddy, 2013). Capital employed is the sum of stockholders' equity and long-term finance. Alternatively, capital employed can be computed as the difference between total assets and current liabilities. According to Shil (2009), a more exact value can be computed by using average capital employed that is the sum of average long-term finance and average stockholders' equity.

Some analysts (Shoven & Whalley, 1972; Young, 1997; Feldstein, 1974; Modigliani & Miller, 1963) use earnings before interest and tax instead of net profit while computing return on capital employed. Since ROCE includes long-term finance in the computation, consequently, it is more thorough test of profitability as compared to return on equity. A higher value of return on capital employed is auspicious indicating that the company creates more earnings per shilling of capital employed. A lower value of ROCE indicates lower profitability (Harrison et. al., 2011). A company having fewer assets but have same profit as its competitors have higher value of return on capital employed and thus higher profitability.

2.3.3 Mobile Banking and Financial Performance

According to Mbuki (2010), savings and credit cooperative societies have team up with the leading mobile service providers in the country in order to bring fundamental financial services to its customers at their fingertips. He further cited that in setting the pace of innovation within

the banking industry, saving and credit societies have to work directly with Safaricom global pioneer money transfer service via the M-Pesa to enable their customers to debit their existing accounts while at the same time credit their M-Pesa accounts. This greatly has influenced the convenience of these financial transactions to customers. Nevertheless, there are other mobile service providers like Orange Money for Orange, Airtel Money for Airtel, and YU Cash for YU Mobile Kenya amongst others. These other mobile service providers have however not been popular to many people just like M-Pesa for Safaricom (Aker & Mbiti, 2010).

Solid competition, however, exist among the SACCOs in Kenya where some have been compelled to remain open for seven days a week in an effort to appeal more clients. They are aggressively trailing growth in personal loan products. However, according to Davenport (2013), the banking industry is still much behind in terms of Information Technology systems which have often made their processing costs very high as each branch has its own infrastructure. This means that, any work which could be done at a central place, then distributed to the branches through networking is done at the branch level hence increasing transaction costs of staff needed and thus reduces efficiency.

New legislations, new information technology infrastructure and fresh strategic directions will strongly influence towards growth of the banking industry in Kenya. Most of the savings and credit cooperative societies have therefore achieved branchless banking through Automated Teller Machine (Muriithi, 2014).

2.3.4 Savings and credit cooperative societies

Savings and Credit Co-operative Society system covers a mutual membership organization involving pooling deliberate savings together from cooperators in form of shares. Savings and credit cooperative societies are user-owned organizations with savings accumulated to act as SACCOs' wealth. The shareholders share a common bond based on a mutual area of interest, namely; their geographical area, employment, community, business, economic sector and any other connection. The fundamental services of SACCOs include savings and credit but other services such as money transfers, payment services, insurance and member development are also tendered (Ndemo & Wanjiku, 2007). Indeed, in the words of Owen (2007), SACCO societies are playing a major role on savings mobilization for the advantage of the members. The primary concern of a savings and credit cooperative society is to build the financial power that will

ensure constant service to members. Apparently, the SACCOs' affluence needs to be well-managed for the attainment of the SACCOs' objectives.

Savings and credit cooperative movement in Kenya has had remarkable growth, going by its fame among the ordinary Kenyans. However, the biggest breakthrough has been the incorporation of technology in their operations, a move that has seen SACCOs improve efficiency, curb fraud and enhance service efficiency to customers (Koduk, 2015). He investigated one such SACCO. The Kirinyaga based Bingwa SACCO scraped ten awards in the 2014 national cooperative awards. As of 11 July 2014, the little known SACCO bragged of a 9.4 billion shillings loan portfolio and prompt expansion due to the use of technology in its operations.

According to Nyangosi et. al., (2009), ATM banking is one of the first and widely adopted retail e-banking services in Kenya. However, according to an annual report by Central Bank of Kenya (CBK), its espousal and usage has been outshined by mobile banking in the latter few years (Koduk, 2015). The proposed reason for this is that several low income earners now have access to mobile phones. Since the introduction of e-banking in Kenya, SACCOs have seen many changes which have led to them having access to quick, efficient and convenient banking services. Odhiambo, (2008) noted that most SACCOs in Kenya are investing huge sums of money in mobile banking technology. This tendered them a competitive advantage.

2.4 Empirical Review

This section reviewed empirical cases that comprise innovations such as mobile banking as well as those that govern performance of savings and credit cooperative societies in their operations. A number of studies show that mobile banking has noticeable positive effect on savings and credit cooperative society productivity, banking transaction volume, savings and credit cooperative society services delivery, customers' services, among others and therefore, they have a positive effect on the growth of banking industry (Malhotra & Singh, 2010; & Ngumi, 2014).

Tchouassi (2012) carried out a study to examine whether mobile phones really work to outspread banking services to the unbanked using empirical lessons from Selected Sub-Saharan Africa Countries. The study examines how mobile phones could be used to extend banking services to the unbanked, poor and vulnerable population. The studies noted that poor, vulnerable and low-

income families in Sub- Saharan African countries often lacked access to SACCO accounts and therefore are faced with high costs for performing essential financial transactions. Therefore, mobile phone offers a great opportunity for the provision of financial services to the unbanked. In addition to technological and economic innovation, policy and regulatory innovation is required to make these services a reality.

Hsu & Ching (2011) studied the factors affecting Malaysian mobile banking adoption from the point of an empirical analysis. The study aimed at expanding the Technology Acceptance Model to investigate mobile banking acceptance in Malaysia. More specifically, the objective of this study was to investigate the relationships between constructs of perceived usefulness, perceived ease of use, social norms, perceived risks, perceived innovativeness, and perceived relative advantages regarding behavioral intention in adopting mobile banking. The findings of this study disclosed that perceived usefulness, perceived ease of use, relative advantages, perceived risks and personal innovativeness are the factors affecting the behavioral intention of mobile users to accept mobile banking services in Malaysia. Meanwhile, the social norms are the only factor found to be insignificant in this study.

Donner & Tellez (2008) did a study on mobile banking and economic development where he connected adoption, effect, and use. The study established that beyond offering a way to lower the costs of moving money from place to place and offering a way to bring more users into contact with formal financial systems, mobile banking and mobile payments systems could prove to be an important innovation for the developing world. However, according to Greco, et, al., (2005) the true measure of that magnitude necessitate multiple studies using multiple methodologies and multiple theoretical perspectives before answering the questions about adoption and effect.

Tiwari, et. al., (2006, July) did a study on mobile banking as business strategy more particularly on the effect of mobile technologies on customer behaviour and its effects to the SACCOs. The study sought to investigate the opportunities for savings and credit cooperative societies to generate revenues by offering value added, innovative mobile financial services while retaining and even widening their base of technology-savvy customers.

Wambari (2009) studied mobile banking in emerging countries using a case of Kenya. The study sought to establish the value of mobile banking in the day-to-day running of small businesses and to understand the challenges necessitated in using mobile banking as a business tool consequently appreciating the advantages and disadvantages therein. The study elaborated that the adoption and use of mobile phones is a result of a social process, entrenched in social practices such as small and medium enterprise practices which leads to some economic benefits.

Al-Jabri & Sohail (2012) studied mobile banking adoption by looking at the relevance of diffusion of innovation theory. This study sought to investigate a set of technical features and how they shape mobile banking adoption in a developing nation, like Saudi Arabia. The study uses diffusion of innovation as a base-line theory to explore the factors that may affected mobile banking adoption and use. More specifically, the objective of this research was to investigate the potential facilitators and inhibitors of mobile banking adoption.

According to Koivu (2002), uptake of mobile phone in Kenya has been extraordinary. Mobile banking in Kenya affects performance of business, behavior and decision making of the entire economy. The drift of continued reliance on mobile devices to execute monetary transaction is steadily gaining momentum. Mobile banking is one of the innovations which has progressively bestowed itself in a pervasive ways of cutting across several sectors of economy and industry.

Kigen (2010) studied the effect of mobile banking on transaction costs of microfinance institutions where he found out that mobile banking had cut transaction costs considerably though they had not directly been felt by savings and credit cooperative societies because of the then small mobile banking customer based. He further did an investigation to uncover the effect that mobile banking have on transactional costs of microfinance institutions.

Poff & Zimmerman (2010) found that mobile banking in developing world is an object of disbelief among financial insiders while proponents argued that cell phones can transform personal finance in poor countries whereas regulators warn of money laundering. Therefore, most bankers worried that low customer balances would not be worth transaction costs. From the above discussion of empirical literature, this study hypothesizes that mobile banking supports the delivery of mobile banking services in an economy to enhance financial performance.

2.5 Research gap

From the above discussion of the theoretical and empirical literature, most of the studies have looked into the wider electronic banking as opposed to specifically mobile banking whereas the ones on mobile banking have inadequate research conducted on the effect of mobile banking on financial performance of saving and credit cooperative societies in Nakuru CBD, Kenya.

Different scholars have carry out studies on mobile banking in Kenya. Kigen (2010) studied the effect of mobile banking on transaction costs of savings and credit cooperative societies where he found out that, by then, mobile banking had reduced transaction costs significantly though they were not directly felt by the savings and credit cooperative societies because of the then small mobile banking customer base. The current study differs from Kigen (2010) because the frequency of mobile banking and the number of savings and credit cooperative societies that have adopted mobile banking have increased. In addition, this study considered the general financial performance and not just transactional costs.

Kingoo (2011) did a study on the connection between mobile banking and financial performance of microfinance institutions in Kenya where he paid keen attention on the microfinance Institutions in Nairobi. However, the current study focused on the savings and credit cooperative societies in Nakuru CBD and not microfinance institutions. Kingoo (2011) also looked at the wider electronic banking whereas this study only concentrated on mobile banking. Mutua (2013) reviewed the notion of mobile banking as a strategic response where its effect on financial performance was not considered. From the above discussions, it is evident that not much research has been focused on the effect of mobile banking on the performance of savings and credit cooperative societies in Kenya. This research therefore aimed at bridging the gap.

2.6 Conceptual Framework

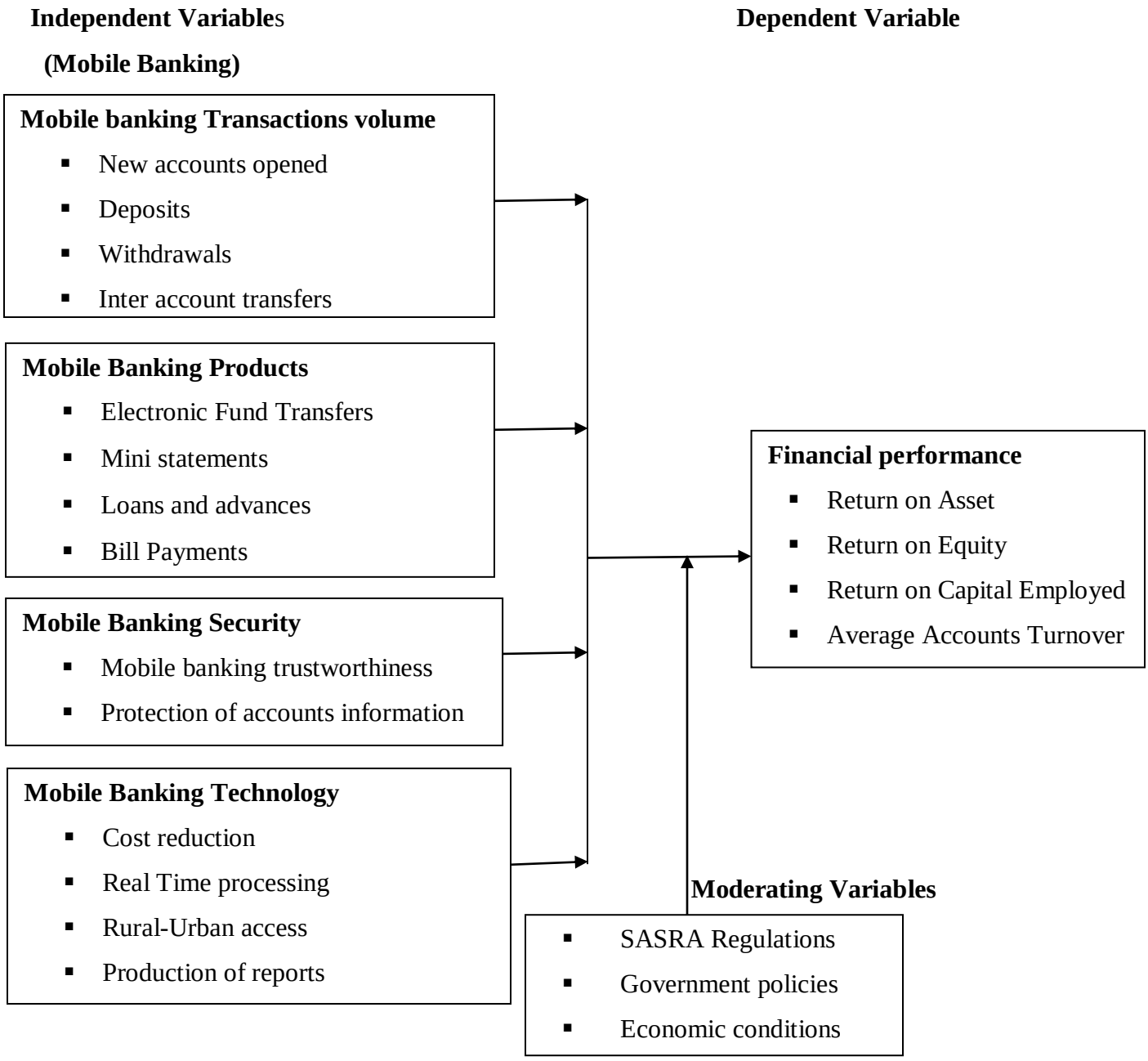

Figure 2.1: Financial Performance of saving and credit cooperative societies

Source: Researcher (2016)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This section outlines the procedure and methods that this study employed in order to obtain data. It comprises of the description of the area of study, the research design, target population, sample size, data collection instruments and procedures, pilot study, reliability and validity of the instruments, data processing and analysis, and lastly, ethical considerations

3.2 Research design

The study adopted descriptive research design in order to describe the state of affairs as it existed when reporting the findings. Mugenda & Mugenda (2003) pointed out that descriptive studies result in the formulation of important principles of knowledge and solution to significant problems. Descriptive design enabled the researcher to measure, analyze, compare and interpret data in order to understand the effect of mobile banking on financial performance of savings and credit cooperative societies in Nakuru CBD.

3.3 Target population

Target population refers to the entire group of individuals or objects to which researchers were interested in generalizing the conclusions (Kothari, 2003). The target population for the study comprised of all the 11 savings and credit cooperative societies licensed and regulated pursuant to the provisions of Sacco Societies Regulatory Authority operating within Nakuru CBD. According to Karagu & Okibo (2015), the total number of registered savings and credit cooperative societies in Kenya as at December 2015 was 164, out of which 11 operate within Nakuru CBD as shown in appendix IV. Therefore, the researcher carried out a census study.

3.4 Sample Size

Mugenda & Mugenda (2003) defines sample size as an act of choosing the number of observations to include in a statistical sample. The sample size is an important feature of any empirical study in which the goal is to make inferences about a target population. The study carried out a census study since the population was small. The researcher used purposive sampling method to select a sample size from the target population. Therefore from each SACCO, a Manager, Finance Officer, Mobile Banking Officer, Information Technology Officer,

Loans Officer, Customer Service Officer and Operations Officer were selected. Thus, the total sample size was 77 respondents. Purposive sampling method was appropriate for this study because these officers in an organization were the one with key information concerning mobile banking and financial performance of the SACCOs.

3.5 Data Collection Instruments and Procedures

Data was collected using questionnaires and document analysis on secondary data. These questionnaires were prepared and administered on respondents by the researcher through drop and pick later basis. The researcher also relied on several sources for secondary data; audited and published financial statements of the target SACCOs, the Sacco supervisory annual reports, the Kenya National Bureau of Statistics and some directly from the savings and credit cooperative societies.

3.6 Pilot Study of the Instruments

Pre-testing of data collection instruments was carried out in order to enable the researcher to assess the clarity of the research instruments. Wilkinson & Birmingham (2003) argued that pre-testing allows errors to be discovered as well as acting as tool for training research teams before the actual collection of data begin. He further argues that effective revision was the result of determining participant's interest, discovering if questions were meaningful to participants, checking for participants modifications of question intent, examining questions continuity and flow. Mugenda & Mugenda (2003) indicated that 1% to 10% of the sample size was considered adequate for a pilot study as such subjects were involved in pre testing. The researcher sampled out six respondents from Egerton SACCO Society that constitute 5% of the target population. They were however not included as part of the study group but their comments and corrections were useful in reconstruction of the questionnaire.

3.7 Reliability and validity of the Instruments

Mugenda & Mugenda (2003) defined reliability as the extent to which a research instrument yields findings that are consistent each time it is administered to the same subjects. To achieve high level of reliability, the study employed self-administration approach of data collection. Most questionnaires were filled as the researcher wait. The researcher provided clarifications where

necessary and ensured that the right people filled the questionnaires. This made the research findings more objective and dependable.

Validity of the instruments refers to the ability of the questionnaires to measure different variables in order to establish how they interact and influence one another (Mugenda & Mugenda, 2003). The researcher selected a pilot group from the target population to test the reliability of the research instruments. In order to test the reliability of the instruments, internal consistency techniques was applied using Cronbach's Alpha. The alpha value ranges between 0 and 1 with reliability increasing with the increase in value. A coefficient of 0.6-0.7 is a commonly accepted rule of thumb that indicated acceptable reliability and 0.8 or higher indicated high reliability (Mugenda & Mugenda, 2003). The researcher obtained a Cronbach's Alpha of $\alpha = 0.7$ thus the research instruments were reliable to give acceptable results.

3.8 Data processing and Analysis

The researcher collected both secondary and primary data. For primary data, the study used questionnaires to obtained quantitative and qualitative data for analysis. Quantitative and qualitative data were collected in this study. Quantitative data was coded and analyzed using Statistical Package for Social Sciences and Microsoft excel software. Both qualitative and quantitative data were presented using tables. In addition, data was analyzed using presentational tools such as frequency distribution tables, figures, mean and the standard deviation.

3.9 Ethical Considerations

To ensure maintenance of ethical standards, from the beginning to the completion of the study, the researcher obtained informed consent from the respondents and ensured that all the respondents participate voluntarily in the study. Privacy and anonymity of the respondents was maintained throughout the study. Openness and honest disclosure of information concerning the purpose and the benefits of the research to the respondents was also maintained.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND DISCUSSION

4.1 Introduction

This chapter presents the results of analysis and discussions. It presents analysis of the data to determine the effect of mobile banking on financial performance of savings and credit cooperative societies in Nakuru CBD. The chapter also provides the major findings and results of the study.

4.2 Response Rate

The researcher administered 77 questionnaires out of which, 66 questionnaires were filled and collected by the researcher. This represents a response rate of 85.71% which according to Mugenda & Mugenda (2003) was acceptable for data analysis.

Table 4.1: Response Rate

Number of questionnaires issued	Number of questionnaires returned	Percentage
77	66	85.71%

4.3 General Information

4.3.1 Gender of the respondents

The study sought to determine the gender distribution of the respondents and the outcomes were as shown in figure 4.1 below;

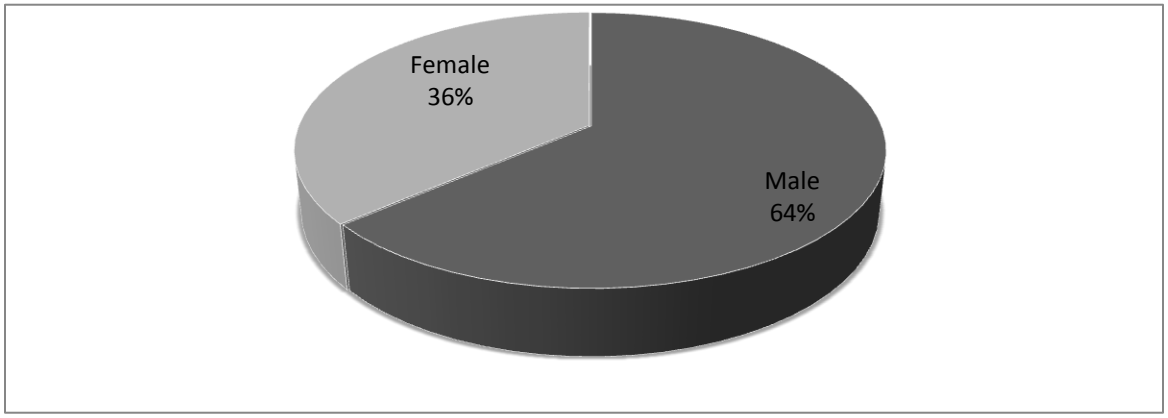

Figure 4.1: Gender of the respondents

Source: Research data, 2016

From the research findings, the study revealed that majority of the respondents represented by 63.6% were male whereas 36.4 % of the respondents were female. This implies that majority of employees of savings and credit cooperative societies are male.

4.3.2 Respondent's departmental distribution

The respondents were requested to state the departments in which they worked in at the Sacco. The results were as shown in table 4.2 below;

Table 4.2: Department of the respondents

Department	Frequency	Percent
Operations department	14	21.2
Information Communication Technology department	17	25.8
Loans and Advances department	10	15.2
Product development department	12	18.2
Accounting and Finance department	13	19.7
Total	**66**	**100.0**

Source: Research data, 2016

From the study findings, majority of the respondents represented by 25.8% were from the information communication technology department, 21.2% of the respondents were from the operations department, 19.7% of the respondents were from accounting and finance department, 18.2% of the respondents were from product development department, 15.2% of the respondents were from the loan and advances department. These findings show that respondents were drawn from all the departments throughout the savings and credit cooperative societies with Nakuru CBD.

4.3.4 Position of the respondents in the SACCO

The respondents were required to state their position in the savings and credit cooperative society and the outcome were as shown in figure 4.2 below;

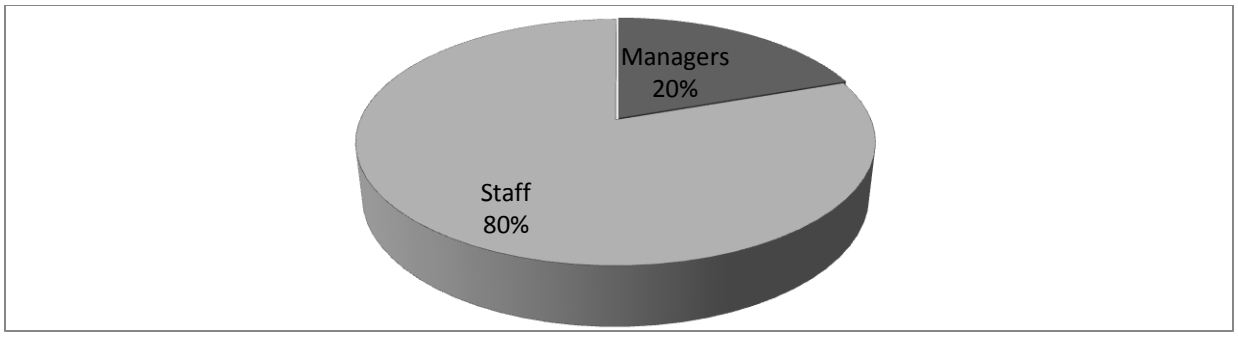

Figure 4.2: Position of the respondents in the SACCO

Source: Research data, 2016

The research findings revealed that majority of the respondents represented by 80.3% were SACCO staff whereas 19.7% of the respondents were managers. This therefore shows that

4.3.5 Period of service the respondents have been with the current SACCO

Respondents were required to state the period of service they have been with the current Sacco and the results were as shown in table 4.3 below;

Table 4.3 Period of service the respondent have been with the current SACCO

Period	Frequency	Percent
Less than 1 year	13	19.7
1 - 2 years	24	36.4
2 - 5 years	15	22.7
More than 5 years	14	21.2
Total	**66**	**100.0**

Source: Research data, 2016

The study findings revealed that most of the respondents represented by 36.4% had been working in their current SACCOs for 1 to 2 years, 22.7% of the respondents had been working for more than 5 years, 21.2% of the respondents had been working for between 2 to 5 years, while 19.9% of the respondents had been working for less than 1 year. These findings depicts that majority of the respondents had been working for a long period of time in their SACCOs and have understood the effects of mobile banking on the financial performance of their SACCOs.

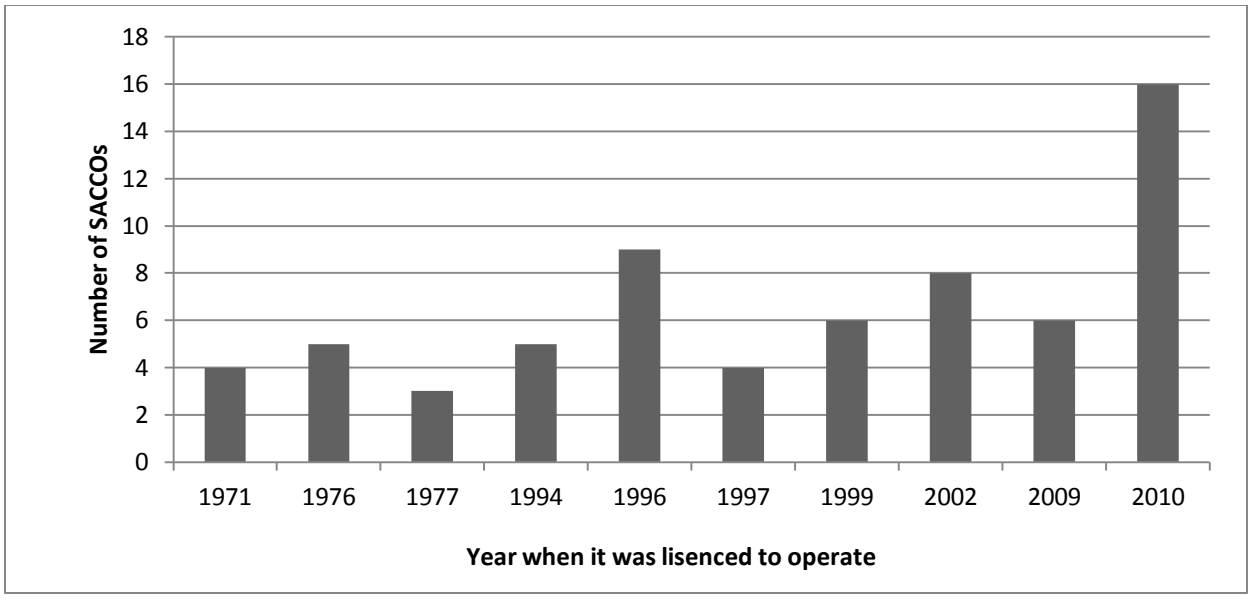

Figure 4.3: Year in which the SACCO society was licensed to operate

Source: Research data, 2016

Figure 4.3 above indicates that majority (24.2%) of the savings and credit cooperative societies were licensed in or before the year 2010. Nonetheless, 13.6% of the SACCOs were licensed in 1996, 8% of the SACCOs were licensed in 2002, 9.1% of the SACCOs were licensed in 1999 and 2009 respectively. Moreover, 7.6% of the SACCOs were licensed in 1994 and 1976 respectively. Furthermore, 6.1% of the SACCOs were licensed in 1997 and 1971 respectively. Lastly, 4.5% of the SACCOs were licensed in 1977. From figure 4.3, the researcher found out that all of the SACCOs under study were licensed on / before the year 2010. This implies that all the savings and credit cooperative societies had been licensed to operate by the Sacco Societies Regulatory Authority.

4.4 Descriptive Statistics

4.4.1 Mobile banking transactions volume

4.4.1.1 Reasons for adopting mobile banking services by SACCOs

The research sought to established the level of agreement to which the respondents think might have made the savings and credit cooperative society adopt mobile banking services and the results were as shown in table 4.4 below;

Table 4.4 Reasons for adopting mobile banking services

Reasons	SA Freq (%)	A Freq (%)	N Freq (%)	D Freq (%)	SD Freq (%)	χ^2	P> χ^2
Reduce costs	20 (30.3%)	35 (53.0%)	8 (12.1%)	3 (4.5%)	0 (0%)	36.909[a]	<.001
Increase outreach	35 (53.0%)	21 (31.8%)	5 (7.6%)	4 (6.1%)	1 (1.5%)	63.394[b]	<.001
Competitive advantage	38 (57.6%	21 (31.8%)	6 (9.1%)	1 (1.5%)	0 (0%)	50.485[a]	<.001
Increased profitability	27 (40.9%)	22 (33.3%)	12 (18.2%)	4 (6.1%)	1 (1.5%)	38.091[b]	<.001
To conform with, market leaders/Industry	32 (48.5%)	25 (37.9%)	4 (6.1%)	4 (6.1%)	1 (1.5%)	61.424[b]	<.001

{Key: SA-Strongly agree; A-Agree; N- Neutral; D-Disagree; SD- Strongly disagree}

Source: Research data, 2016

Majority of the respondents (83.3%) (Strongly agreed and agreed) significantly (χ^2 =36.9, P≤.001) that reduced costs was the reason for adopting mobile banking services. Concerning increased outreach, (84.8%) of the respondents (strongly agreed and agreed) (χ^2 =63.4, P≤.001) that increased outreach was the reason for adopting mobile banking service. (89.4%) of the respondents (strongly agreed and agreed) significantly (χ^2 =50.5, P≤.001) that competitive advantage was the reason for adopting mobile banking services. (74.2%) of the respondents (strongly agreed and agreed) significantly (χ^2 =38.1, P≤.001) that increased profit was a factor for adopting mobile banking services. (86.4%) of the respondents (strongly agreed and agreed) significantly (χ^2 =61.4, P≤.001) that conformity with, market leaders/industry was a reason for adopting mobile banking services by the savings and credit cooperative societies.

All the above responses returned a Chi square values that were significant (P values < 0.01). It is clear from the above findings that most of the respondents were in agreement that the reasons for

adopting mobile banking services were due to reduced costs, increased outreach, competitive advantage, and conformity with, market leaders/industry. Similarly, Donner & Tellez (2008) revealed that by linking mobile banking adoption, impact and use, organizations were able to significantly reduced operation costs hence making savings and credit cooperative societies to be more competitive by bringing more users into contact with formal financial systems.

4.4.1.2 Frequency to which SACCO members use mobile banking services

Respondents were asked to state the frequency to which customers use mobile banking services and their feedbacks were as indicated in table 4.5 below;

Table 4.5 Frequency to which SACCO members use mobile banking services

Services	VO Freq (%)	O Freq (%)	S Freq (%)	N Freq (%)	Nal Freq (%)	χ^2	P> χ^2
Deposit cash	38 (57.6%)	16 (24.2%)	10 (15.2%)	0 (0%)	2 (3.0%)	43.333[a]	<.001
Sent money	32 (48.5%)	22 (33.3%)	9 (13.6%)	2 (3.0%)	1 (1.5%)	54.758[b]	<.001
Withdraw cash	40 (60.6%)	16 (24.2%)	9 (13.6%)	0 (0%)	1 (1.5%)	51.455[a]	<.001
Bill payments	12 (18.2%)	24 (36.4%)	19 (28.8%)	6 (9.1%)	5 (7.6%)	20.515[b]	<.001
Purchase commodities	10 (15.2%)	19 (28.8%)	22 (33.3%	10 (15.2%)	5 (7.6%)	15.061[b]	<.005

{*Keys: *VO-Very Often, O-Often, S-Sometime, N-Never, Nal-Not at all}

Source: Research data, 2016

Majority (81.8%) of the respondents (very often and often) significantly (χ^2 =43.3, P≤.001) that they were using their mobile banking services to deposit cash to their respective accounts. With regard to send money, (81.8%) of the respondents significantly sent money (very often and often) (χ^2 =54.8, P≤.001) through mobile banking services. (84.8%) of the respondents

significantly withdraw cash (very often and often) (χ^2 =20.5, P≤.001) using their mobile banking services. 44% of the respondents significantly purchase commodities (very often and often) (χ^2 =15.1, P≤.005) through the use of mobile banking platform.

All the above responses, except purchase commodities, returned Chi square values that were significant (P values = 0.05). It is, therefore, clear from table 4.5 that majority of the respondents frequently use mobile banking services. Pertaining to the purchase of commodities (P value = 0.05) making it a less significant mobile banking service that was frequently used by savings and credit cooperative societies' customers. This means that these products are frequently used by the SACCO members to make transactions. In accordance with other authors (Chitungo et. al., 2013; Dermish et. al., 2011; Masinga, 2010) the study found that mobile banking customers are driven by the convenience that is brought about by the technology in terms of deposits, sending money, and withdrawals of cash.

4.4.1.3 Number of SACCO members registered for mobile banking services

The respondents were required to indicate the number of members who were registered for mobile banking services by the savings and credit cooperative societies and the results were as presented in figure 4.4 below;

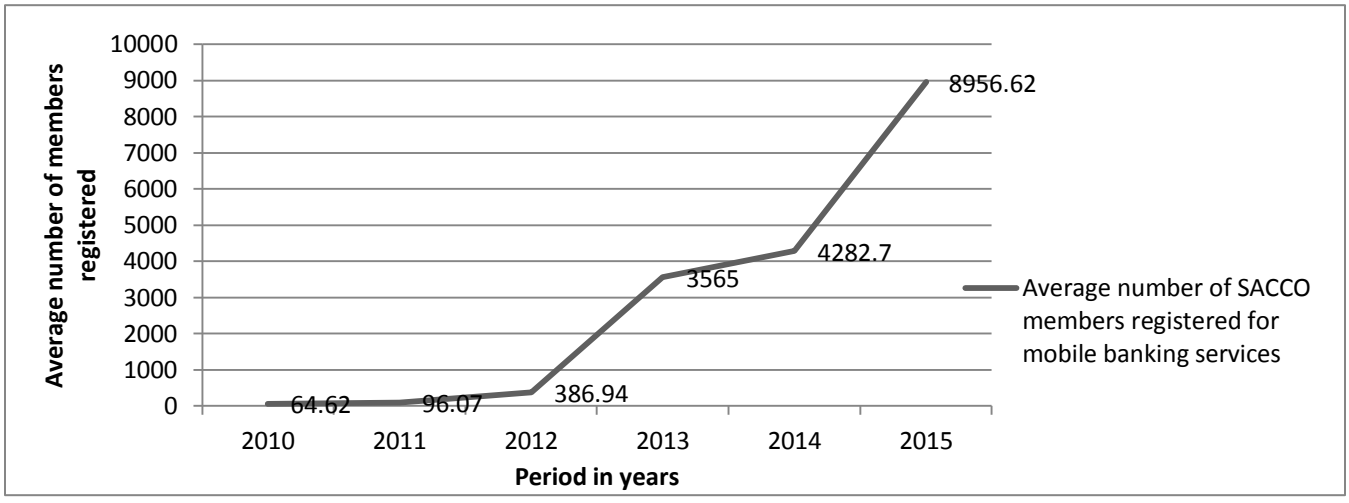

Figure 4.4: Average number of SACCO members registered for mobile banking services

Source: Research data, 2016

From figure 4.4 above, the researcher found that the average number of Sacco members registered for mobile banking were on an increasing trend with a mean of 64.62 in 2010 to a mean of 8956.62 in 2015. These findings implies that majority of the SACCO members were linking their accounts with the mobile phone application in order to be able to use the mobile banking services that were available at their savings and credit cooperative societies.

4.4.1.4 Average amount of transactions moved through mobile banking platform

The study sought to examined the total amount moved through mobile banking by savings and credit cooperative societies in Nakuru CBD for each period from 2010-2015 and the results were as presented in table 4.6 below;

Table 4.6: Average amount of transactions made through mobile banking service

Period	2010	2011	2012	2013	2014	2015
New accounts opened under mobile banking	46	84	219	31,738	45,885	71,249
Deposits made through mobile banking	13,214	71,249	75,444	103,262	285,650	693,894
Withdrawals made through mobile banking	18,211	38,208	114,526	620,152	543,465	793,939
Amount of cash moved through mobile banking inter account transfers	175	1,300	10,200	17,894	40,330	108,135

Source: Research data, 2016

Table 4.6 shows that on average, the amount of transactions move through mobile banking were noted to have constantly increased since 2010 to 2015. The findings indicate that on average, the number of new accounts opened under mobile banking had increased from 46 in 2010 to 71,249 in 2015. The average amounts of deposits moved through mobile banking platform have also increased steadily from a mean of 13,214 in 2010 to a mean of 693,894 in 2015. Concerning withdrawals made through mobile banking, it was noted that, on average, there was a gradual growth on the amount withdrawn from 18,211 in 2010 to 793,939 in 2015. The average amounts of cash moved through mobile banking inter account transfers were noted to have increased from 175 in 2010 to 108,135 in 2015. Generally, on average, the total amounts of transactions moved

through mobile banking have been on an increasing trend (Table 4.6). Similar to Kilonzi (2012) findings, frequent used of an account results to increased financial performance of savings and cooperative societies.

4.4.2 Mobile banking products

4.4.2.1 Mode of access to mobile banking products

The study sought to determine the mode of access to mobile banking products in the SACCO society. The results were as shown in table 4.7 below;

Table 4.7: Mode of access to mobile banking products

Mode	Frequency	Percent
Through dialing of USSD code	24	36.4
Using Sacco application	23	34.8
Those using both USSD code and Sacco application	19	28.8
Total	**66**	**100.0**

Source: Research data, 2016

Table 4.7 above shows that, majority (24%) of the savings and credit cooperative societies access mobile banking products through dialing of USSD code whereas 23% of the respondents stated that they were using SACCO application to access mobile banking products. However, 19% of the respondents contemplated that savings and credit cooperative societies were using both dialing of USSD code and SACCO application to access to the mobile banking products menu.

4.4.2.2 Benefits of Mobile banking products to the SACCO societies

Respondents were required to tick from the list some of the benefits that their organization have derived from utilization of mobile banking products and the results were as shown in table 4.8 below;

Table 4.8: Benefits of mobile banking products to organizations

Benefits of Mobile banking products	Frequency	Percent
Real time access, Rural urban access to banking information and time savings	16	24.2
Real time access, rural-urban access to banking information, time savings and less queues in the SACCO hall	33	50.0
Real time access, rural-urban access to banking information	4	6.1
Real time access, time savings and rural-urban access to banking information	9	13.6
Real time access, time savings and less queues in the SACCO hall	4	6.1
Total	**66**	**100.0**

Source: Research data, 2016

Majority (50%) of the respondents indicated that real time access, rural-urban access to banking information, time savings and less queues in the SACCO hall were some of the benefits that savings and credit cooperative societies derived from utilization of mobile banking products services. 24.2% of the respondents stated that real time access, rural urban access to banking information and time savings were some of the benefits their SACCO societies enjoyed. 13% of the respondents benefited from real time access, time savings and rural-urban access to banking information. 6.1% of the respondents stated that real time access, time savings and less queues in the SACCO hall. Similarly, according to Wambari (2009), some of the importance of mobile banking in day-to-day running of businesses was a product of social process, embedded in social practices which results to economic benefits.

4.4.2.3 Average amount of transactions moved through mobile banking platform

The study sought to establish the average amount of transactions that were moved through the mobile banking platform and the findings were as indicated in table 4.9 below;

Table 4.9: Average amount of transactions moved through mobile banking platform

Period	2010	2011	2012	2013	2014	2015
Electronic fund transfers	1,248,484	1,731,818	5,492,367	11,279,708	20,964,386	49,729,304
Mini statements	10,078	34,502	45,999	99,390	143,269	168,366
Loans and advances	2682	20636	254206	428576	575550	714344
Bill payments	76	295	1,309	1,402	7,790	9,646

Source: Research data, 2016

Table 4.9 shows that on average, the amount of transactions moved through mobile banking platform were noted to have increased through the period (2010 to 2015). On average, the number of electronic fund transfers transactions moved through mobile banking platform had increased from 1,248,484 in 2010 to 49,729,304 in 2015. The average amount of mini statements transactions moved through mobile banking have also increased from 10,078 in 2010 to 168,366 in 2015. Concerning loans and advances moved through mobile banking, table 4.9 shows that there has been a positive growth of 714,344 transactions in 2015 as compared to 2,682 transactions in 2010. Bill payments transactions were also noted to have increased from 76 in 2010 to 9646 in 2015. Similarly to Koivu (2002) arguments, the uptake of mobile phone in Kenya has been unprecedented with the trend of continued reliance on mobile devices to execute monetary transaction is steadily gaining momentum.

4.4.2.4 Value of mobile banking products to the SACCO

The study sought to examine respondents' opinion on their view concerning the value of mobile banking products to the SACCO. The results were however as shown in table 4.10 below;

Table 4.10: Value of mobile banking products to the SACCOs

Value of Mobile banking products	Frequency	Percent
I don't know	3	4.5
I don't see any value	5	7.6
There is value but not worth investment	14	21.2
There is substantial value (Just enough)	15	22.7
There is great value worth the investment	29	43.9
Total	**66**	**100.0**

Source: Research data, 2016

Majority (43.9%) of the respondents were in strong agreement that there was great value worth the investment on mobile banking products. Further, 22.7% of the respondents stated that there was a substantial value, while 21.2% of the respondent believed that there was value but it does not worth the investment. Nevertheless, 7.6% of the respondents saw no need for mobile banking products whereas 4.5% of the respondents had no idea on whether mobile banking products have any value to the SACCO. Tiwari et. al., (2006, July) asserted that the opportunities for savings and credit cooperative societies to generate revenues were through offering value added, innovative mobile financial services while retaining and even extending their base of technology-savvy customers.

4.4.2.5: Respondent's level of agreement to the mobile banking products

The researcher sought to determine the level to which the respondents were in agreement with the statements concerning mobile banking products. The results were as indicated in table 4.11 below;

Table 4.11 Respondent's level of agreement to the mobile banking products

Mobile Banking products	SA Freq (%)	A Freq (%)	N Freq (%)	D Freq (%)	SD Freq (%)	χ^2	P> χ^2
Mobile banking products have enabled Sacco to utilize assets efficiently	23 (37.1%)	24 (38.7%)	11 (17.7%)	3 (4.8%)	1 (1.6%)	37.677[a]	<.001
Mobile banking products have led to an increase in profits	25 (40.3%)	23 (37.1%)	12 (19.4%)	2 (3.2%)	0 (0%)	2.000[b]	<.001
The Sacco society has been having required capital for the mobile banking services but has invested little in products development	18 (29.0%)	17 (27.4%)	17 (27.4%)	6 (9.7%)	4 (6.5%)	14.935[a]	<.001

{Keys: *SA- Strongly agree; A- Agree; N- Neutral; D- Disagree; SD- Strongly disagree}*

Source: Research data, 2016

From table 4.11 above, the findings indicated that majority (75.5%) of the respondents significantly (strongly agreed and agreed) (χ^2 =37.7, P≤.001) that mobile banking products have enabled savings and credit cooperative societies in Nakuru CBD to utilized its assets efficiently. (77.4%) of the respondents significantly (strongly agreed and agreed) (χ^2 =22.0, P≤.001) that mobile banking have led to an increase in profits while 56.4% of the respondents significantly (strongly agreed and agreed) (χ^2 =14.9, P≤.001) that the Sacco society has been having the required capital for the mobile banking services but has invested little in products development.

All the responses in table 4.11 above recorded a Chi square that were significant (P values < 0.05). This depicts that mobile banking products have greatly contributed to the general growth in the financial performance of the savings and credit cooperative societies in Nakuru CBD.

Barrett et. al., (2015) noted in their study that savings and credit cooperative societies were collaborating with telecommunicating service industries to offer integrated services to their clients therefore they invested much capital in products development of mobile banking services.

4.4.2.6 Respondent's opinion on what SACCOs can do to improve on performance

The study sought to examine respondent's opinion on what the savings and credit cooperative societies can do in order to improve on performance related to mobile banking products. The results were as indicated in table 4.12 below;

Table 4.12 Respondent's opinion on what SACCOs can do to improve on performance

Respondent's Opinion	Frequency	Percent
Add more products to the system	5	7.6
Create more products	3	4.5
Do more advertisement	3	4.5
Do more research and development	2	3.0
Employ more capital on the technology	2	3.0
employ more staff	2	3.0
Invest more funds	2	3.0
Invest more on research and development	2	3.0
Make more links with telecommunications industry	1	1.5
Put more resources on the technology	3	4.5
Reduced transaction costs	5	7.6
Sensitize clients on the benefits of mobile banking	3	4.5
Set a competitive prices to charge	4	6.1
used both ussd and sacco application	1	1.5
Others	24	36.4
Total	**66**	**100.0**

Source: Research data, 2016

From table 4.12 above, the findings revealed that majority (7.6%) of the respondents stated that adding more products to the mobile banking services and reducing transaction costs were the best practices that savings and credit cooperative societies could do in order to improve on their

financial performance. Nevertheless, setting up of competitive prices to charge, create more products, do more advertisement, do more research and development, employ more capital on the technology, employ more staff, invest more funds, invest more on research and development, make more links with telecommunications industry, put more resources on the technology, sensitize clients on the benefits of mobile banking, set a competitive prices to charge, used both ussd and sacco application and others. According to Tchouassi (2012) study, mobile phones could be used to extend banking services to the unbanked, poor and vulnerable population. The studies noted that poor, vulnerable and low-income households in Sub- Saharan African countries often lacked access to SACCO accounts and therefore are faced with high costs for conducting basic financial transactions. Therefore, mobile phone banking presents a great opportunity for the provision of financial services to the unbanked.

4.4.2.7 Respondent's level of agreement with the costs of mobile banking services

The respondents were asked to state whether they think mobile banking services were cheaper than the traditional banking services and the results were as indicated in figure 4.5 below;

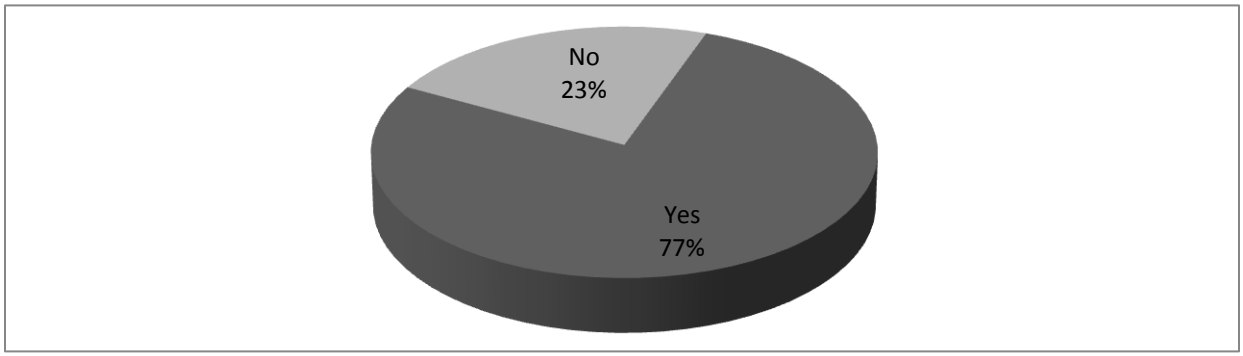

Figure 4.5: Respondent's level of agreement with the costs of mobile banking services

Source: Research data, 2016

Majority (77.3%) of the respondents believed that mobile banking services are much relatively cheaper than traditional banking services which have been support only 22.7% of the respondents. This implies that the cost of transacting through mobile banking application is cheaper than those of traditional SACCOs. Kigen (2010) found out that mobile banking had reduced transaction costs considerably though they had not directly been felt by savings and credit cooperative societies because of the then small mobile banking customer based.

4.4.2.8 Respondent's knowledge on the banking services available through the Sacco branch and mobile banking services

The study sought to establish the respondents' knowledge of all the services that are available through their savings and credit cooperative society branch and also mobile banking services. The findings were as shown in the table 4.13 below;

Table 4.13 Respondent's knowledge on the banking services available through the SACCO branch and Mobile banking services

Services	Very high Freq (%)	High Freq (%)	Neutral Freq (%)	Low Freq (%)	Very low Freq (%)	χ^2	P> χ^2
SACCO Branch	31 (47.0%)	24 (36.4%)	10 (15.2%)	0 (0%)	1 (1.5%)	33.27[a]	<.001
Mobile Banking Services	30 (45.5%)	27 (40.9%)	6 (9.1%)	3 (4.5%)	0 (0%)	35.45[a]	<.001

Source: Research data, 2016

Majority (83.4%) of the respondents have significantly (very high and high) (χ^2 =33.3, P≤.001) knowledge of the banking services that are available through the SACCO branch (Table 4.18) while (86.4%) of the respondents have significantly (very high and high) (χ^2 =35.5, P≤.001) knowledge of the banking services that were available through the mobile banking services. The findings show that majority of the respondents were familiar with the services that the SACCOs offered in their branches as well as those that were offered through mobile banking platform.

Table 4.13 above returned a Chi square values that were significant (P values < 0.05). Therefore, majority of the respondents have very high knowledge of all the services that were being offered through the savings and credit cooperative societies branch as well as those services which were offered through the mobile banking platform. Consistent with the findings of Koduk (2015), savings and credit cooperative movement in Kenya has had tremendous growth and popularity among the ordinary Kenyans.

4.4.3 Mobile Banking Security

4.4.3.1 Importance of mobile banking security

The study sought to evaluate the importance of mobile banking security based on the reasons to consider using mobile banking. The findings were as presented in table 4.14 below;

Table 4.14 Importance of mobile banking security

Importance	VI Freq (%)	I Freq (%)	N Freq (%)	PI Freq (%)	NI Freq (%)	χ^2	P> χ^2
Low transaction costs	22 (33.3%)	29 (43.9%)	12 (18.2%)	3 (4.5%)	0 (0%)	23.576[a]	<.001
Enhanced security from frauds	27 (40.9%)	17 (25.8%)	11 (16.7%)	7 (10.6%)	4 (6.1%)	25.212[b]	<.001
Safe transaction with feedback on transfer	34 (51.5%)	20 (30.3%)	10 (15.2%)	1 (1.5%)	1 (1.5%)	59.606[b]	<.001
Mobile money wide acceptance	23 (34.8%)	23 (34.8%)	13 (19.7%)	6 (9.1%)	1 (1.5%)	29.758[b]	<.001
More locations to cash-out mobile money	30 (45.5%)	19 (28.8%)	11 (16.7%)	4 (6.1%)	2 (3.0%)	40.212[b]	<.001

{Key: VI-*Very Important;* I-*Important; N-Neutral;* PI-*Partially Important;* NI-*Not Important}*

Source: Researcher data, 2016

Table 4.14 shows that majority (77.2%) of the respondents believed banking that low transaction costs were significantly (very important and important) (χ^2=23.6, P≤.001) factors of mobile banking security while (66.7%) of the respondents stated that enhanced security from frauds were significantly (very important and important) (χ^2=54.8, P≤.001) factors of mobile banking security. (81.8%) of the respondents indicated that safe transaction with feedback on transfer was significantly (very important and important) (χ^2=59.6, P≤.001) factor of mobile banking security. With regard to the mobile money wide acceptance, 69.6% of the respondents were in strong support (very important and important) significantly (χ^2=29.8, P≤.001) that mobile banking security was important when using mobile banking services. 74.3% of the respondents

were (very important and important) significantly (χ^2 =40.2, P≤.001) that of more locations to cash-out mobile money.

According to Jing, et. al. (2014), the important of system security is to provide services that have adequate protection from fraud and violation of privacy then gaining customers' trust hence providing low transaction costs. Furthermore, Amin (2009) revealed that acceptance of mobile banking should provide broaden knowledge among the banking users with adherence to the highest protection to safeguard their privacy and security of banking information hence they adopt mobile banking.

All the above responses returned a Chi square values that are significant (P values < 0.05). It was also noted in table 4.14 that majority of the respondents frequently used mobile banking services. However, pertaining to the purchase of commodities, the Chi square value was equal to the P values (P value = 0.05) making it less significant mobile banking service that was frequently used by savings and credit cooperative societies' customers. Donner & Tellez (2008) posits that by linking mobile banking adoption, impact and use, it helped an organization to significantly reduced operation costs hence making the SACCO to be more competitive by bringing more users into contact with formal financial systems.

4.4.3.2 Level of satisfaction with the system security of mobile phone banking services

The study sought to rate the respondents' level of satisfaction with the system security of their mobile phone banking services and their results were as indicated in table 4.15 below;

Table 4.15: Level of satisfaction with the system security of mobile phone banking services

Level of satisfaction	Frequency	Percent
Very satisfied	18	27.3
Satisfied	29	43.9
Neutral	5	7.6
Unsatisfied	7	10.6
Very unsatisfied	7	10.6
Chi square	**31.57**	
P>Chisq	**0.001**	

Source: Researcher data, 2016

Majority (71.2%) of the respondents was significantly (very satisfied and satisfied) ($\chi^2 = 31.6, P \leq 0.001$) with the system security of their mobile phone banking services (Table 4.23). This however shows that majority of the customers trust the used of mobile banking services to make transactions with the savings and credit cooperative societies. The responses in table 4.15 above recorded a Chi square that were significant (P values < 0.05). This shows that mobile banking security have greatly contributed to the general growth in the financial performance of the savings and credit cooperative societies in Nakuru CBD. According to Koenig et. al., (2010), the increased in information access terminals along with the growing use of information sensitive applications such as mobile banking has generated a real requirement of reliable, easy to use, and generally acceptable control methods for confidential and vital information.

4.4.4 Mobile Banking Technology

4.4.4.1 Benefits of using mobile based banking technology

The respondents were asked to state their level of agreement to the benefits of mobile based banking technology. The responses were as shown in table 4.16 below;

Table 4.16 Benefits of using mobile based banking technology

Benefits	**SA**	**A**	**N**	**D**	**SD**	χ^2	**P>** χ^2
	Freq (%)	**Freq (%)**	**Freq (%)**	**Freq (%)**	**Freq (%)**		
Reduced Sacco operating costs	23 (34.8%)	29 (43.9%)	11 (16.7%)	2 (3.0%)	1 (1.5%)	47.333[a]	<.001
Real time processing of accounts information	34 (51.5%)	21 (31.8%)	8 (12.1%)	3 (4.5%)	0 (0%)	35.212[b]	<.001
Rural-urban access of banking information	41 (62.1%)	19 (28.8%)	3 (4.5%)	2 (3.0%)	1 (1.5%)	89.758[a]	<.001

(Key: SA-*Strongly agree;* A-*Agree;* N- *Neutral;* D-*Disagree;* SD- *Strongly disagree)*

Source: Research data, 2016

From table 4.16 above, the findings depict that majority (78.7%) of the respondents significantly (strongly agreed and agreed) (χ^2 =47.3, P≤.001) that reduced operating costs for savings and credit cooperative societies were some of the benefits of using mobile banking technology. (83.3%) of the respondents significantly (strongly agreed and agreed) (χ^2 =35.2, P≤.001) that real time processing of accounts information was among the benefits of using mobile banking technology by the SACCOs. (90.9%) of the respondents significantly (strongly agreed and agreed) (χ^2 =89.6, P≤.001) that rural-urban access of banking information was considered by the savings and credit cooperative societies as one of the benefit of using mobile banking technology.

From the responses in table 4.16 above, a significant Chi square were recorded in all the responses. This indicated that savings and credit cooperative societies had considered all the above responses as benefits of using mobile banking technology. Consistent with the findings of Riquelme & Rios (2010); Ngii (2013); Muchiri (2016), savings and credit cooperative societies were introducing mobile banking technology services with an aimed of lowering transaction costs and thus reaching out to a larger number of clients.

4.4.4.2 Costs of mobile banking services

The study sought to establish whether the costs of mobile banking services were cheaper or expensive and the results were as presented in table 4.17 below;

Table 4.17: Cost of mobile banking services

Costs of services	Frequency	Percent
Very cheap	9	13.6
Cheap	23	34.8
Neutral	17	25.8
Expensive	11	16.7
Very expensive	6	9.1
Total	**66**	**100.0**

Source: Research data, 2016

The findings presented in table 4.17 above shows that majority (34.8%) of the respondents were in agreement that the costs of mobile banking services were cheap. This implies that most of the customers would prefer using mobile banking services than the traditional banking services. In agreement with Donner (2007, May) who argued that mobile banking services are more convenient and cheaper to those customers who have already an account with the savings and credit cooperative societies.

4.4.5 Financial performance of savings and credit cooperative societies

4.5.1 Average total investment on mobile banking

The study sought to examined the average amount of total investment on mobile banking services for the last six years and the results were as indicated in figure 4.6 below;

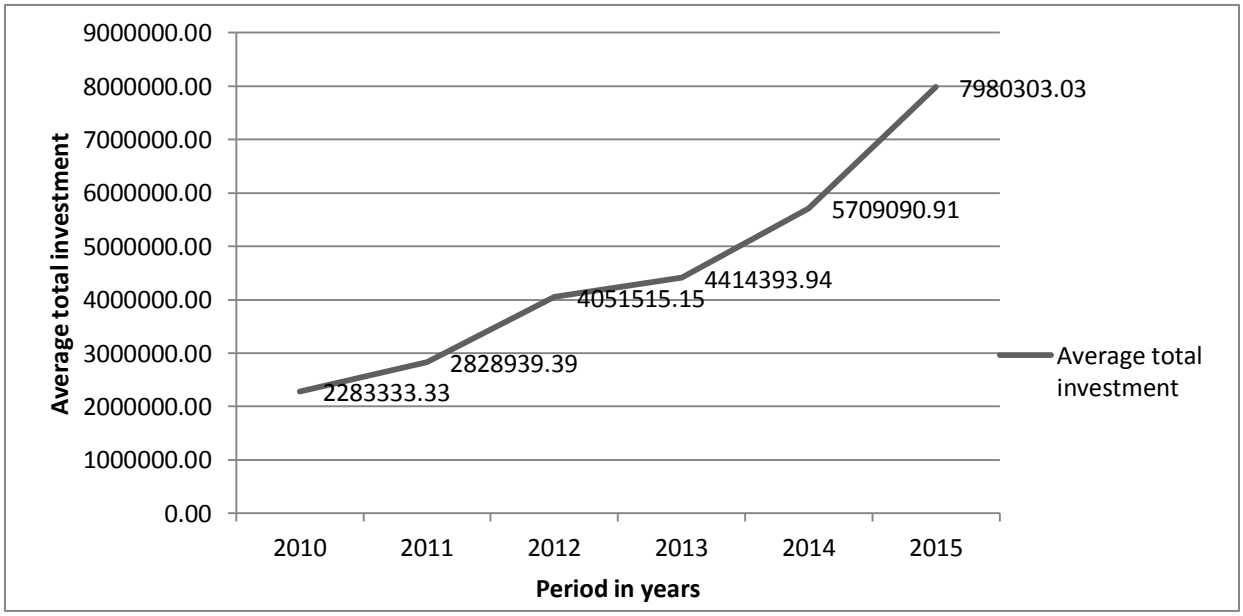

Figure 4.6: Average total investment on mobile banking

Source: Researcher data, 2016

The study findings show a gradual increased in the average total investment made by the savings and credit cooperative societies from an average of Kshs. 2283333.33 in 2010 to Kshs. 7,980,303.03 in 2015. This indicates that SACCOs were making huge investment on mobile banking services therefore utilizing the efficiency in using its resources (Laforet & Li, 2005). However, in the period 2012 - 2013, there was a gradual decrease in the average total investment that savings and credit cooperative made on mobile banking which might have been

contributed to the fact that the number of customers which were registering for mobile banking services were considerably low as compared to the period 2013 to 2015.

4.5.2 Average total net income on mobile banking

The study sought to examined the average amount of total net income that were earned from the mobile banking services for the last six years and the results were as indicated in figure 4.7 below;

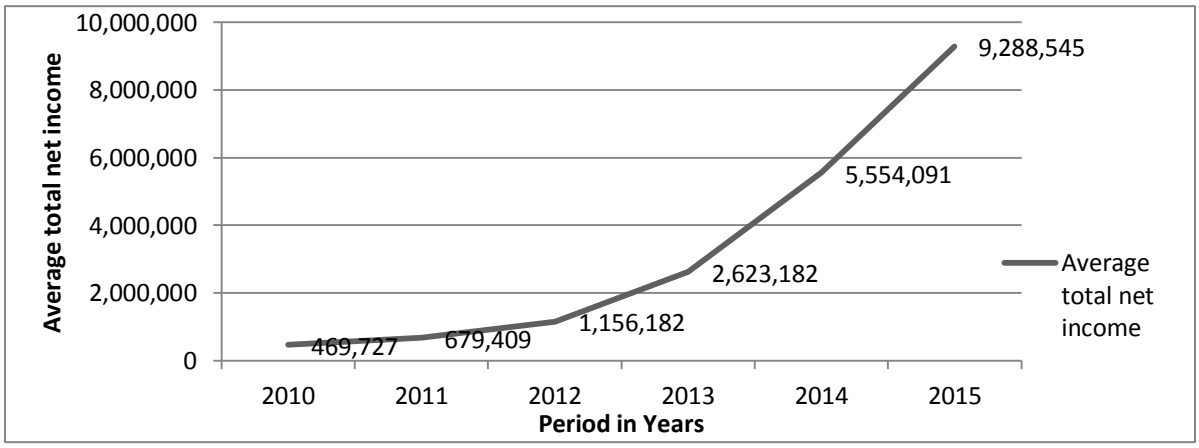

Figure 4.7: Average total net income for mobile banking

Source: Researcher data, 2016

The findings in figure 4.7 above show that an average total net income from mobile banking services have increased from Kshs. 469,727.27 in 2010 to Kshs. 9,288,545.45 in 2015. This growth was as a result of efficiency and effectiveness in turns of costs associated with mobile banking services (Koduk, 2015). From the study findings, it is noted that mobile banking was greatly contributing to the financial performance of the savings and credit cooperative societies.

4.5.3 Average total expenditure on mobile banking

The study sought to examined the average amount of total expenditure that were incurred on the mobile banking services for the last six years and the results were as indicated in figure 4.8 below;

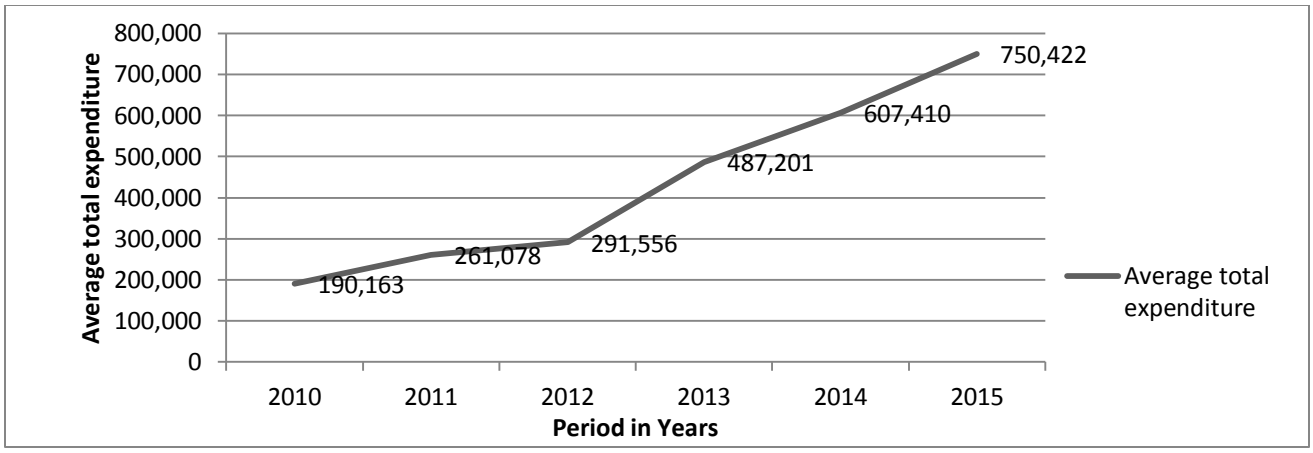

Figure 4.8: Average total expenditure on mobile banking services

Source: Researcher data, 2016

From figure 4.8, it shows that there had been an increased in the average total expenditure for mobile banking services from Kshs. 190, 163 in the period 2010 to Kshs. 750,422 in 2015. The gradual increase in average total expenditure was lower than the average total net income (figure 4.7) that the savings and credit cooperative societies earned in the respective periods. There was however a slight decrease in total expenditure for the period 2011- 2012 which might have been due to huge investment which was made by savings and credit cooperative societies. It can also be noted that the income for that period was also low hence might have contributed to the decrease in average total expenditure for the period 2011–2012.

4.5.4 Average return on assets for mobile banking services

The study sought to examined the average return on assets from the mobile banking services for the last six years and the results were as indicated in figure 4.9 below;

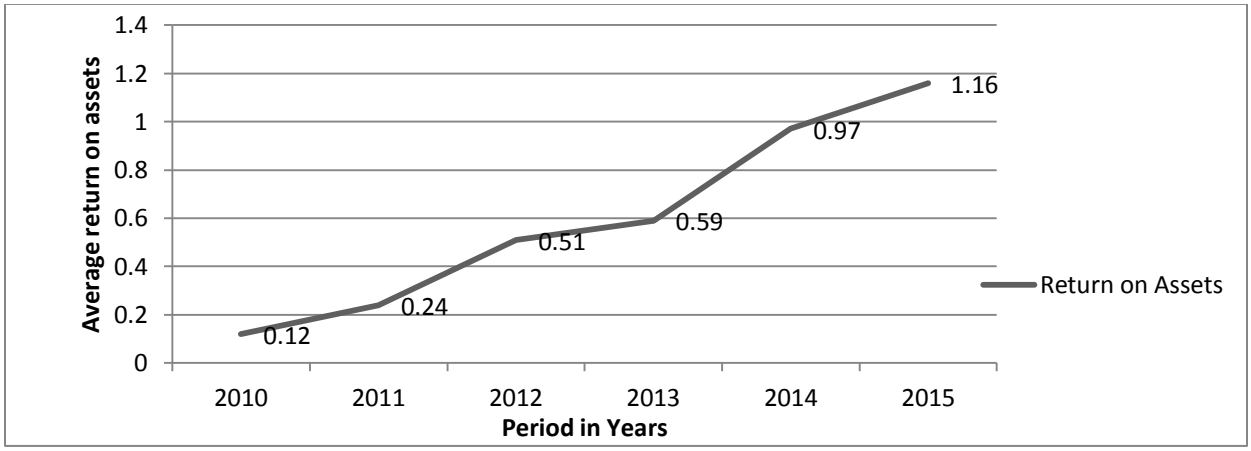

Figure 4.9: Average return on assets for mobile banking services

Source: Researcher data, 2016

From the results findings in figure 4.9 above, a return on assets can be noted to have increased from an average of 0.12 in 2010 to 1.16 in 2015. The increased however depicts that there have been a positive growth from the return on assets from mobile banking. In agreement with Harrison et. al., (2011), a higher value of return on capital employed is favorable indicating that the company generates more earnings per shilling of capital invested on mobile banking. As noted above, there is a slight decreased in the return on asset from the investment in the period 2012-2013. The decrease can be attributed to high degree of total investment that the savings and credit cooperative societies were making on the mobile banking platform. However Khrawish & Al-Sa'di (2011) argued that a business that has a high return on asset is more likely to be one that is capable of generating cash internally.

4.5.5 Average profits from mobile banking services

The study sought to examined the average amount of total profits from the mobile banking services for the last six years and the results were as indicated in figure 4.10 below;

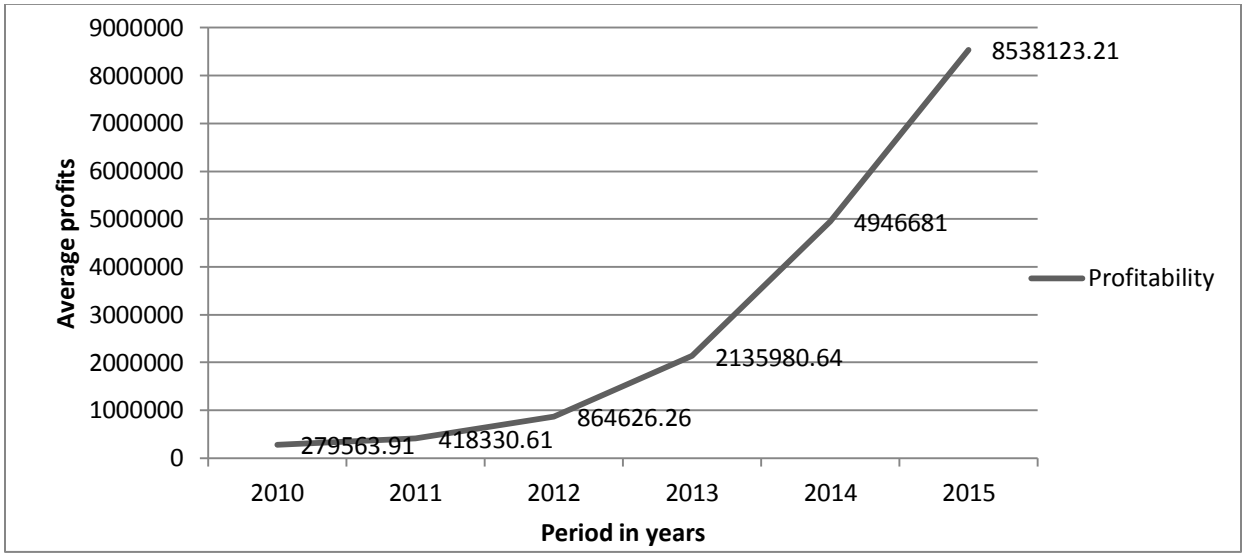

Figure 4.10: Average total profits from mobile banking services

Source: Researcher data, 2016

The study findings show that there have been on average increase in profits from the mobile banking services (Figure 4.10). From the results, it can be noted that SACCOs were making an

average profit of Kshs. 279563.91 in 2010 to Kshs. 8538123.21 in 2015. This increased in profit was however contributing to the general growth of the performance of SACCOs in Nakuru CBD. As noted by Harrison, et. al., (2011), a company earning profits has higher value of return thus a higher financial performance.

CHAPTER FIVE

SUMMARY OF THE FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the study, conclusions and recommendations on the effect of mobile banking on financial performance of savings and credit cooperative societies in Nakuru CBD.

5.2 Summary of the findings

This study had four main objectives to achieve. The first was to determine whether mobile banking transaction volumes have any effect on the financial performance of SACCOs in Nakuru CBD; the second was to determine whether mobile banking products have any effect on financial performance of SACCOs in Nakuru CBD; the third was to examine the effect of mobile banking security on the financial performance of SACCOs in Nakuru CBD; and the fourth was to establish the effect of mobile banking technology on financial performance of SACCOs in Nakuru CBD. Descriptive statistics such as mean, figures, frequency tables and standard deviation were used to analyze data in order to achieve these objectives.

5.2.1 Effect of mobile banking transaction volumes on financial performance of SACCOs

Regarding the first objective, the results from descriptive analysis revealed that majority of respondents have been offering mobile banking services. The study findings indicates that majority of the respondents have been using mobile banking services to make deposits, send money, withdrawals cash, and to transfers fund. The results further indicated that the total amount of mobile banking transactions, on average, have a positive effect on the financial performance of savings and credit cooperative societies. This positive relationship was noted from the variables attributed to mobile banking transaction volumes which have greatly increased during the last six years (2010 - 2015) of the study. In line with the findings of Kilonzi (2012), frequency used of an account leads to an increased in transaction costs, therefore, have led to improved financial performance of SACCOs in Nakuru CBD.

5.2.2 Effect of mobile banking products on financial performance of SACCOs

From the finding related to the second objective, results revealed that mobile banking products which include electronic fund transfers, mini statements, loans and advances, and bill payments have a positive effect on the financial performance of the savings and credit cooperative societies. It is also noted that majority of the respondents were in agreement that mobile banking products have led to efficient utilization of assets and consequently led to improved financial performance of SACCOs in Nakuru CBD. These findings concur with Cruz et. al., (2010), who found that by complementing services offered by the banking system, such as cheque books, automated teller machine, Voice mail/landline interfaces, smart cards, point of sale networks and internet resources, mobile platform have offered a convenient additional method for managing money without handling cash. Hence, mobile banking has made the banking services more efficient and thus, has positively affected the financial performance of savings and credit cooperative societies in Nakuru CBD.

5.2.3 Effect of mobile banking security on financial performance of SACCOs

From the finding related to the third objective, it is clear that mobile banking security has a positively effect on the financial performance of the savings and credit cooperative societies. From the descriptive analysis, majority of the respondents have indicated that they have a lot of trust on the services offered through the mobile banking platform to providing tight protection of accounts information. The findings further show that majority (71.2%) of the respondents were significantly (very satisfied and satisfied) ($\chi^2 = 31.6, P \leq 0.001$) with the mobile banking system security (Table 4.15). This means that more transactions were effected through the mobile banking by the clients since they had trusted their mobile banking security. As also noted in chapter four, more customers were, on average, increasingly linking their SACCO accounts with their mobile phone platform.

5.2.4 Effect of mobile banking technology on financial performance of SACCOs

Regarding the fourth objective, the finding revealed that majority of the respondents were in agreement that mobile banking technology has significantly reduced operational costs, let to real time processing of transactions, rural-urban access of account information by clients and production of SACCO financial reports on time. The findings further indicate that majority of the SACCO members have good knowledge on the services that were being offered through the

mobile phone. The respondents also stated the benefits of mobile banking technology to have significantly affected the operation of the SACCOs. From the descriptive analyzing of the variables on mobile banking technology, it is clear that there exist a positive relationship between mobile banking and the financial performance of the savings and credit cooperative societies in Nakuru CBD.

5.3 Conclusion of the study

The study made the following conclusions;

5.3.1 Effect of mobile banking transaction volumes on financial performance of SACCOs

The study has established that, on average, the total amount of mobile banking transaction volumes had tremendously increased from the period 2010 to 2015 of the study. The study thus concludes that savings and credit cooperative societies that had positive acceptability of mobile banking services have to a large extent increased their customer outreach, and hence have improved their financial performance. Salzaman et. al., (2001) noted that mobile banking have enabled clients to send and receive electronic money wherever they have cell phone coverage, hence making the banking services more readily available to their clients.

5.3.2 Effect of mobile banking products on financial performance of SACCOs

The findings further revealed that many mobile banking products such as electronic fund transfers, mini statements, loans and advances, and bill Payments are being offered by savings and credit cooperative societies. From the findings, the study concludes that financial performance of the SACCOs that provides mobile banking products has improved as they have ensured efficiency of the banking services to their customers. These findings concur with Cruz et. al., (2010), who found out that those SACCOs which complemented their services offered by the banking system, such as mobile banking, are more efficient and hence have improved their financial performance.

5.3.3 Effect of mobile banking security on financial performance of SACCOs

From the research findings, the study concludes that mobile banking security has greatly contributed to the growth of financial performance of the savings and credit cooperative societies in Nakuru CBD. The results from the variables related to mobile banking security have significantly indicated a positive relationship between the mobile banking security and the

financial performance of SACCOs in Nakuru CBD. In agreement with Nayak et al. (2014) findings, mobile banking security should provide adequate protection of accounts information from fraud and violation of privacy. Furthermore, Amin (2009) posits that mobile banking security should provide broaden knowledge among the banking users with adherence to the highest protection to safeguard their privacy and security of banking information hence they adopt mobile banking.

5.3.4 Effect of mobile banking technology on financial performance of SACCOs

The study also concludes that mobile banking technology has significantly affected the financial performance of the savings and credit cooperative societies in Nakuru CBD. From the descriptive analysis on the variables of mobile banking technology, it is clear that there is a positive relationship between mobile banking technology and the financial performance of SACCOs. The study also concludes that there are a lot of benefits that customers enjoyed from using mobile banking technology. The study further concludes that majority of the respondents were able to accessed their accounts information at their convenient time and location.

5.4 Recommendation of the study

In line with the study conclusions above the following recommendations are made;

The study recommends that all the savings and credit cooperative societies need to provide as many mobile banking products as possible. However, the study recommends that proper caution should be taken to ensure that the services offer adequate customers' trust, security as well as awareness of the mobile banking products.

The study recommends that savings and credit cooperative societies should lower the transaction charges incurred by customers, reduce time taken to complete transaction and improve the quality of mobile banking services so as to motivate them use the mobile banking services. This will increase the number of transactions and hence improve the financial performance of the SACCOs.

The study also recommends that policy makers keep a keen eye on the developments of mobile banking as it is a new platform which offers financial opportunity for SACCOs as the world moves into a digital age to ensure it does not lose its regulatory role.

The study further suggests that further research be conducted on the relationship between mobile banking and financial performance in other central business districts within Kenya. This study only focused on Nakuru CBD yet the mobile banking has been adopted in all parts of Kenya.

5.5 Recommendation for further Research

This study sought to determine the effects of mobile banking on the financial performance of savings and credit cooperative societies in Nakuru CBD.

The study suggests that further research be conducted on the effects of mobile banking on the financial performance of other institutions in Nakuru CBD and in all counties within Kenya.

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APPENDIX I: AUTHORIZATION LETTER

KABARAK UNIVERSITY

OFFICE OF THE DIRECTOR - NAKURU TOWN CAMPUS

P.O. Box 3270 Nakuru. Tel. 051-2215549 Fax 051-343012, Email - nakurutowncampus@kabarak.ac.ke

28th September, 2016

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

RE : KIPKURUI RUTO - GMB/NE/0056/01/15

This is to confirm that Kipkurui is a bona fide student of Kabarak University registered for **Master of Business Administration – Accounting Option.**

As part of the requirement for a Masters Degree in Kabarak University, Kipkurui is required to undertake a research project. The student is currently pursuing a research work on "**Effect of Mobile Banking on the Performance of Savings and Credit Co-operative Societies in Nakuru Central Business District."**

The information awarded to him will be used for purpose of the research only and will be confidentially handled.

Any assistance accorded to them will be highly appreciated.

Yours faithfully

Kabarak University
Nakuru Town Campus
P.O. Private Bag 20157
Kabarak

Dr. Maina Waiganjo
DIRECTOR – NAKURU TOWN CAMPUS

MW/ek

Moral Code – "We purpose at all times and in all places, to set apart in one's heart, Jesus as Lord" 1 Pet 3:15

APPENDIX II: LETTER OF INTRODUCTION

Kipkurui Ruto,
P.O. Box 26-20209,
FORT-TERNAN.

Telephone No: +254707 497 776

Email address: e*nockruto02@gmail.com*

September 28, 2016

Dear Respondent,

RE: REQUEST FOR PERMISSION TO CARRY OUT RESEARCH STUDY

I'm an MBA student of Kabarak University, currently undertaking a research study on the effect of mobile banking on financial performance of saving and credit cooperative societies in Nakuru Central Business District. To enable me complete my research study successfully, I need your assistance in completing the questionnaires below.

Please be assured that all answers provided in this questionnaire will be treated with utmost confidentiality. Thank you in advance and God bless you.

Yours sincerely,

Kipkurui Ruto

(**Researcher**)

APPENDIX III: QUESTIONNAIRE

This questionnaire is meant to collect information on the effect of mobile banking on financial performance of saving and credit cooperative societies in Nakuru, Kenya. Mobile banking is defined as a process by which a customer may perform banking transactions electronically without visiting a brick and mortar institution and its logistical systems. This information is being sought solely for academic purposes and will be treated with strict confidence.

Kindly answer the following questions by writing a brief statement or ticking the boxes provided as will be applicable.

PART A: GENERAL INFORMATION

1. Name of the SACCO (Optional).....
2. What is you gender?

   Male [ ]

   Female [ ]

3. Which department do you work?

   i. Operations department [ ]

   ii. ICT department [ ]

   iii. Loan and advances department [ ]

   iv. Product development department [ ]

   v. Accounting and Finance department [ ]

   vi. Other please specify.....

4. State the period of service you have been with the current SACCO

   i. Less than 1 year [ ]

   ii. 1 - 2 years [ ]

   iii. 2 - 5 years [ ]

   iv. More than 5 years [ ]

5. When was the SACCO licensed? .....

PART B: SPECIFIC QUESTIONS

SECTION A: MOBILE BANKING TRANSACTION VOLUMES

6. How many members does your SACCO Society have? .....

7. State by ticking the following statement on your level of agreement to what you think might have made the SACCO society to adopt mobile banking services;

   (***KEYS**: **1**=strongly agree, **2**=Agree, **3**=Neutral, **4**=Disagree, **5**=strongly disagree)*

Reason to adopt mobile banking	**1**	**2**	**3**	**4**	**5**
Reduce costs					
Increase outreach					
Competitive advantage					
Increased profitability					
To conform with, market leaders/Industry					

8. How often do customers use the following services

Services	**Very often**	**Often**	**Sometimes**	**Never**	**Not at all**
Deposit cash					
Sent money					
Withdraw cash					
Bill payments					
Purchase commodities					
Other uses					

9. Please indicate the total number of customers registered for mobile banking services by the SACCO for the last six years;

PERIOD	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Number of customers registered for mobile banking services						

10. What is the average amount of mobile banking transactions volume on the service per year for the last six years or since inception of mobile banking services by the SACCO?

Period	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
New accounts opened under mobile banking						
Deposits made through mobile banking						
Withdrawals made through mobile banking						
Amount of cash moved through mobile banking inter account transfers						

SECTION B: MOBILE BANKING PRODUCTS

11. What is the mode of access to the Mobile banking products in your SACCO society?

a. Through dialing of unstructured supplementary service data (USSD) code [ ]

b. Using SACCO application [ ]

c. Other Modes (Please specify).....

12. What benefits have the organization derived from utilization of mobile banking products?

a) Real time access [ ]

b) Rural Urban access to banking information [ ]

c) Time saving [ ]

d) Less queues in the SACCO hall [ ]

e) Other benefits (please Specify).....

13. Please indicate the total amount of transactions moved through mobile banking platform for the last six years or since its inception

PERIOD	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Electronic fund transfers						
Mini statements						
Loans and advances						
Bill payments						

Others (Please specify)						

14. In your opinion, do you think mobile banking products have added any value to your SACCO? *(Tick appropriate)*

    i. I don't know [ ]

    ii. I don't see any value [ ]

    iii. There is value but not worth the investment [ ]

    iv. There is substantial value (Just enough) [ ]

    v. There is great value (It is worth the investment) [ ]

15. Evaluate the following statements relating to mobile banking products based on your level to which you agree with them.

    (***KEYS**: **1**=strongly agree, **2**=Agree, **3**=Neutral, **4**=Disagree, **5**=strongly disagree)*

Statement	**1**	**2**	**3**	**4**	**5**
Mobile banking products have enabled SACCO to utilize assets efficiently					
Mobile banking products have led to an increase in profits					
The SACCO society has been having required capital for the mobile banking services but has invested little in products development					

16. In your own opinion, what can the SACCO do in order to improve on performance related to mobile banking products? .....
    .....

SECTION C: MOBILE BANKING TECHNOLOGY

17. Do you think Mobile banking services are cheaper than traditional banking services?

    Yes [ ]

    No [ ]

    If yes, Give your reasons.....
    .....

18. How would you rate your knowledge of all the banking services available through your SACCO branch and your mobile banking service?

(KEYS: 1=Very high**, 2=**High**, 3=** Neutral**, 4=**Low**, 5=**Very low**)**

Banking service	**1**	**2**	**3**	**4**	**5**
Your SACCO branch					
Your Mobile banking service					

19. Evaluate the following statements according to your level of agreement concerning the benefits of mobile based banking technology.

(***KEYS**: **1**=strongly agree**, 2**=Agree**, 3**=Neutral**, 4**=Disagree**, 5**=strongly disagree**)***

Benefits of Mobile banking technology	**1**	**2**	**3**	**4**	**5**
It has helped to reduced SACCO operating costs					
It has enabled real time processing of accounts information					
It has provided rural Urban access (can make transaction anywhere)					
Others (please specify)					

20. Do you find mobile banking service to be cheap or expensive?

Service	**Very cheap**	**Cheap**	**Neutral**	**Expensive**	**Very Expensive**
Cost of mobile banking services					

SECTION D: MOBILE BANKING SECURITY

21. Evaluate the following statements on importance of mobile banking security based on your reasons to consider using mobile banking**.** (**Keys: *1*=*Very Important, 2*=*Important, 3*=*Neutral, 4*=*Not Important, 5*=*Not Important at All*)**

Reasons	**1**	**2**	**3**	**4**	**5**
It lower transaction costs					
It enhances security from frauds					
Safe transaction with feedback on transfer					
Mobile money has wide acceptance					
More locations to cash-out mobile money					
Other reasons (please specify)					

22. How would you rate your level of satisfaction with the system security of the mobile phone banking service?

    i. Very satisfied [ ]
    ii. Satisfied [ ]
    iii. Unsatisfied [ ]
    iv. Very unsatisfied [ ]

23. What other things can you advice the SACCO to consider doing in order to improve on mobile banking technology?.....
    .....

SECTION E: FINANCIAL PERFORMANCE

24. Please indicate the total investment made by the SACCO on mobile banking services in the following periods:

Period	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Total Investment (Kshs) on mobile banking						

25. Please indicate the total net income of the SACCO made through mobile banking for the last six years

Period	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Total Net Income (Kshs) from mobile banking services						

26. Please indicate the total expenditure (Kshs) on Mobile banking services for the last six years

Period	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Total Expenditure (Kshs) on mobile banking per year						

THANKYOU FOR YOUR CO-OPERATION

.....

APPENDIX IV: List of Licensed deposit undertaking SACCO societies operating within Nakuru CBD for the year ending December 2015

No.	Name of the SACCO Society
1	Boresha SACCO Society ltd
2	Afya SACCO Society ltd
3	Cosmopolitan SACCO Society ltd
4	Harambee SACCO Society ltd
5	Mwalimu National SACCO Society ltd
6	Unaitas SACCO Society ltd
7	Uni-County SACCO Society ltd
8	Vision Africa SACCO Society ltd
9	Metropolitan National SACCO Society ltd
10	Stima SACCO Society ltd
11	2NK SACCO Society ltd

Source: SASRA, 2015

APPENDIX V: Data for Quantitative Analysis

Total investment on mobile banking

Period	Mean	max	min	STD
2010	2283333	15000000	0	3585982.108
2011	2828939	11540000	0	4211092.181
2012	4051515	20800000	0	7313326.201
2013	4414394	20000000	0	4820204.99
2014	5709091	30000000	500000	6779016.807
2015	7980303	40000000	300000	10462446.84

Total net income on mobile banking

Period	Mean	max	min	STD
2010	469727.3	1500000	0	570453.2633
2011	679409.1	2300000	0	802585.1928
2012	1156182.0	35000000	0	5994592.234
2013	2623182.0	11500000	0	2682377.908
2014	5554091.0	16000000	160000	4446569.32
2015	9288545.0	23200000	232000	6880650.282

Total expenditure on mobile banking

Period	Mean	max	min	STD
2010	190,163.36	6000000	0	2268624.785
2011	261,078.48	9000000	0	3342953.912
2012	291,555.56	11000000	0	2507602.268
2013	487,201.18	9200000	0	3473977.338
2014	607,409.91	20000000	120000	4403879.136
2015	750,422.24	30000000	150000	6110307.005

Amount of transactions moved through electronic fund transfers

Year	Mean	Min	Max	STD
2010	1,248,484.85	-	5,000,000.00	1,836,739.79
2011	1,731,818.18	-	7,000,000.00	2,555,365.94
2012	5,492,366.67	-	25,000,000.00	8,293,130.56
2013	11,279,708.48	-	50,000,000.00	17,087,426.94
2014	20,964,385.91	-	90,000,000.00	32,285,184.47
2015	49,729,303.94	-	200,000,000.00	73,414,819.74

Amount of transactions moved through mini statements

Year	Mean	Min	Max	STD
2010	10,075.76	-	45,000.00	16,858.97
2011	34,501.52	-	182,000.00	58,870.15
2012	45,998.64	-	172,000.00	64,611.27
2013	99,390.15	-	356,000.00	137,315.51
2014	143,225.89	1,000.00	580,000.00	197,392.63
2015	168,366.09	1,800.00	470,000.00	188,290.74

Amount of transactions moved through Loans and advances

Year	Mean	Min	Max	STD
2010	2,681.82	-	17,000.00	6,056.55
2011	20,636.36	-	140,000.00	43,738.26
2012	254,206.06	-	3,000,000.00	794,038.47
2013	428,575.76	-	4,700,000.00	1,242,014.44
2014	575,549.85	-	6,900,000.00	1,828,168.38
2015	714,343.70	-	8,100,000.00	2,142,271.37

Amount of transactions moved through Bill payments

Year	Mean	Min	Max	STD
2010	75.76	-	1,000.00	266.64
2011	295.45	-	2,000.00	673.55
2012	1,309.09	-	4,500.00	1,671.82
2013	1,401.52	-	7,800.00	2,404.13
2014	7,789.70	-	24,860.00	8,609.04
2015	9,645.53	-	47,000.00	14,571.90

Number of customers registered for mobile banking services

Year	Mean	Min	Max	STD
2010	64.62121212	0	417	112.6489121
2011	96.07575758	0	369	111.2161182
2012	386.9393939	0	1500	482.0843488
2013	3565.00000	400	9800	2874.808542
2014	4282.69697	0	28300	8535.769853
2015	8956.621212	600	42000	11281.70541

Amount of new accounts opened under mobile banking

Year	Mean	Min	Max	STD
2010	45.65	-	192.00	69.01
2011	83.86	-	240.00	102.77
2012	218.53	-	1,003.00	329.95
2013	31,738.26	-	283,000.00	87,276.91
2014	45,885.09	202.00	391,492.00	120,155.41
2015	71,248.55	360.00	624,197.00	192,105.42

Amount of cash deposits made through mobile banking

Year	Mean	Min	Max	STD
2010	13,213.64	-	100,000.00	28,123.30
2011	71,248.55	360.00	624,197.00	192,105.42
2012	75,443.94	-	750,000.00	215,147.59
2013	103,262.12	-	1,000,000.00	286,161.63
2014	285,650.00	-	2,700,000.00	770,584.14
2015	693,893.94	500.00	7,000,000.00	2,010,501.79

Amount of cash withdrawals made through mobile banking

Year	Mean	Min	Max	STD
2010	18,210.61	-	63,900.00	25,172.93
2011	38,208.33	-	124,000.00	46,733.01
2012	114,525.76	-	329,700.00	136,163.77
2013	620,151.52	-	5,000,000.00	1,422,899.22
2014	543,465.15	200.00	2,000,000.00	764,647.00
2015	793,938.52	-	3,900,000.00	1,426,249.19

Amount of cash moved through mobile banking

Year	Mean	Min	Max	STD
2010	175.00	-	1,050.00	394.31
2011	1,300.00	-	7,800.00	2,929.16
2012	10,200.00	-	61,200.00	22,982.67
2013	17,893.94	-	76,000.00	26,747.32
2014	40,330.30	-	184,000.00	60,933.51
2015	108,134.85	-	718,000.00	218,517.03