

**THE EFFECT OF MOBILE BANKING ON LOANS GRANTED BY
COMMERCIAL BANKS IN KENYA**

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DECLARATION

This research project is my original work that has not been presented for a degree in any other University, for any other award and where other people's research was used, they have been fully acknowledged.

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

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DEDICATION

I dedicate this project to my beloved mother, Jad Mohamud Ali for her unconditional sacrifice, love, encouragement and support during the entire course of MSC Finance program. I also dedicate this project to my brother, Ahmed Ali for giving me the motivation and inspiration to further my studies.

ABSTRACT

The commercial banks face many challenges with the major one being default. Banks earn majority of their incomes from interests from the loans advanced to their clients. This forces the banking institutions to come up with measures to help reduce default risk. The study objective was to establish how mobile banking and loans issued by commercial banks were related. The type of design adopted was descriptive research design. A total of 43 commercial banks were covered. Data was mainly obtained from secondary sources of information. Means, standard deviations and regressions were used in analysis. It was revealed that mobile banking and size of the banks have direct and significant link with loans issued by commercial banks. As a conclusion, the study holds that mobile banking and size of commercial banks positively influence their ability to grant loans to customers. The study recommends that the top management team of all commercial banks should increase investment in mobile banking and sizes to improve on their ability to offer loans to customers. The study also recommends that the central bank of Kenya should come up with sound regulations that encourage the use and adaption of mobile banking platforms among commercial banks for growth in loans granted by commercial banks.

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LIST OF ABBREVIATIONS

ANOVA	Analysis of Variance
ATM	Automatic Teller Machine
CBK	Central Bank of Kenya
CRBs	Credit Reference Bureaus
FOREX	Foreign Exchange
KBA	Kenya Banker Association
KBC	Kenya Commercial Bank
M-banking	Mobile Banking
NPLs	Non-performing Loans
SMS	Short Message Services
SPSS	Statistical Package for Social Science

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Mobile banking refers to use of mobile devices to make financial transactions (Lee & Benbasat, 2004). According to Herstatt, Buse and Tiwari (2006), mobile banking is the use of mobile telephony to perform a financial transaction. The authors further noted that mobile banking ensures that financial information and services are availed to customers at their own convenience through the use of mobile phones. The emergence of mobile banking redefined how banks operate. It increased the competition among banks as they offer modern banking services and led to the decreased costs particularly on labor costs and construction of new branches.

According to Porteous (2006) mobile banking has played a key role in transforming the banking sector. This is due to the fact that in this millennium almost each and every one has access to a mobile device hence the technology is able to reach even those in the interior places where there are no banking halls within their reach. Sakar and Wells (2003) Reiterates that the only hindrance to this new technology is in the cases where one doesn't own a mobile device. This in turn calls for the mobile manufacturing firms to manufacture mobile devices affordable to each and every one in order to ensure the technology is embraced and reaches majority of the population. There exists a wide range of mobile banking transactions and activities in different countries most of which are bank led (Andrew, 2009).

Mobile banking has yielded numerous advantages to many clients particularly those who cannot access banking institutions with ease. Mobile banking users can transfer funds,

check account balances, pay bills from anywhere at less cost. M-banking has tremendously improved the number of people accessing banking services particularly those living in interior places (Mururi, Richu & Karanja, 2015). One key emerging attribute in the banking sector is the increased level of environmental turbulence as manifested through a high level of competition. As a response to these changing conditions, banks have been forced to remain innovative in order to stay competitive (Sohail & Shanmugham, 2003). The development in banking sector has led to the increase in number of users of mobile banking services. The prominent mobile banking services offered in Kenya include the KCB M-benki, Equity bank M-Kesho, among others.

1.1.1 Mobile Banking

It is the use of mobile phones and related devices to transact the banking services at one's convenience (Anyasi & Otubu, 2009). It also refers to the ability of clients to conduct banking activities through their mobile devices (Drexelius & Herzig, 2001). Mobile banking is an integral part of any modern banking operations today. Over 50% of people in a number of countries rely on mobile banking in one way or the other (Atman, 2013).

M-banking has brought with its numerous benefits to majority of people particularly those in rural areas where there are no banking halls. It is a convenience and easy way that customers can use to access financial services as well as reducing operating costs of the offering institution. Twari et al., (2007) asserts that M-banking enables banking institutions to retain their existing clients as they can conduct various transactions with ease as well as gaining new ones as this technology can be accessed by majority of people in the society.

Commercial banks in Kenya have embraced this new technology that has seen them get strategic benefits although they face some challenges. The banking institutions in Kenya are in a very competitive industry as the ones in existence offer diversified services and rates of interest at different rates (Manali, 2014). Mobile phone service providers have brought mobile money services into the financial sector by exhibiting a variety of financial services through their various networks (Sheila, 2017). The major concern about this innovation pertains to security of client funds, high transaction costs and prevalence of other banking methods. As a concept, mobile banking is a relatively new idea and it is growing. Its successful implementation depends on the level of security, technology and information platforms and the banking operations.

The mobile banking services available in Kenya are; M-PESA, Orange Money, Yu-Cash, and Airtel Money. The technology is estimated to have about 17 million subscribers with money velocity of Ksh. 2 billion each day, majority of M-banking users prefer MPESA with about 80 percent of the total mobile money users. Majority of Mobile money providers have collaborated with commercial banks in the country to avail various banking services to their clients particularly those living in rural areas where they don't have banking halls (KBA, 2014).

1.1.2 Loans

A loan is a sum of money borrowed from a bank to assist for planned or unplanned events. It can also be defined as the amount advanced to the clients in form of loans is usually recognized as asset in the company's accounting books. They are major assets to financial institutions. The valuation of the loans is not only determined by the rate of interests

they are advanced to the clients but by the probability of default and whether they will be repaid (Janson, 2002). The loans are the main source of income of the banking institutions as they earn majority of their income from the interests from loans from their clients. This is also a major concern as the more a bank has outstanding loans, the more it faces liquidity problem since it becomes difficult to finance operating activities. Hamisu (2011) asserts that lending comes with a lot of risks to the parties involved. The risk of the counterparty which arises when the borrowers don't fulfill their obligation to repay loans in time when the loans are due greatly affects the daily running of the banking institution. The higher the risk is, the higher the probability of becoming bankrupt. Lending is one of the most vital factors in the banking institution operation. Banking institutions gain earn most of their income from the interests of loans advanced to their clients hence managing them becomes important to the institutions in this sector. The integration of mobile banking increases the risk faced by the banking institutions in their daily activities Basel (2003).

There are different reasons to borrow money. Individuals borrow money to buy a car or home appliances which yields on considerable return on investment, in services and confort makes sense. Customers also borrow to enhance their education background or training which would increase their future income. The purchase of assets such as consumer durables and investment in improving skills are two of the most familiar and financially reasonable reasons for borrowing. Investments of this kind will long outlast monthly installments. Another reason to borrow is to match lifetime income to lifetime needs and expenditures. For instance, couples starting a household have considerable needs, such as home, car, furniture, etc. at the same time have low income (Marsh and Wild, 1990).

There are different types of bank loans. These include personal loans, business loans, government loans, mortgage loans, educational loans and many others. According to Rose & Hudgins (2008) loans may be divided into seven categories which include real estate loans which are loans given to the borrowers to purchase land, buildings, and other structures. These loans are secured by real properties. Financial institution loans are the loans given to institutions. These loans include the ones advanced mainly to the institutions in the banking sector. Agricultural loans are advanced to both small and large scale farmers who are engaged in agribusiness which is engaging in agricultural activities to earn revenues. Commercial and industrial loans are advanced to corporates to expand their business activities and sometimes to cover liabilities while personal loans are the loans given to individuals to purchase or repair of homes, appliances, and cover medical costs among other factors. The interest rates on personal loans are higher than those on the other types of loans because of the greater perceived risk when authorizing them. The salary or the income of the borrower is the main source of repayment of personal loans. The last one is miscellaneous loans, which are the loans not listed above, include securities loans. Majority of banking institutions categorize loans advanced to clients in order from risky to less risky. This helps them to determine the probability of loans being repaid or defaulted (Gonzalez, 2010).

1.1.3 Mobile Banking and Loans

Mobile banking has indeed revolutionized financial operations in Kenya; both individuals and institutions have continuously embraced this innovation which has led to numerous sub-products tailored to meet their respective financial needs. The financial sector in the

country has witnessed numerous changes. Many changes undertaken in the sector are aimed at diversifying their services and improving efficiency which ensures maximization of revenues. The recent performance of GDP in the country has boosted the need for change in the financial sector (James & James, 2014). James, Odiako and Douglas (2014) argue that the Kenyan banking institutions face a lot of competition forcing them to diversify their services and adopt modern technology to ensure their survival. Use of mobile money bank technology specifically in the banking sector has gained momentum as it enables banks to access clients particularly those in the rural areas where there are no banking halls hence improving their market share. The new technology has improved the banking institutions revenues as their clients can access loans from their mobile devices which cuts operating costs tremendously (Odiako & Douglas, 2014).

Technological advancements which refers to the introduction of mobile banking, agency banking, ATMs among others have introduced new ways of accessing financial services and led to increased users accessing these financial services. The innovation has opened up new opportunities particularly in the African continent which has a lot of untapped potential. The innovation provides an opportunity to ensure each individual in the continent can access banking services at any time (Aker & Mbiti, 2010).

In Kenya there has been integration with mobile money service providers and commercial banks. Mobile phone operators in Kenya provide financial services such as M-PESA by Safaricom, T-Kash by Telkom and Airtel money by Airtel. Commercial banks in developing countries particularly in Kenya play a key role in economic growth as they mobilize funds which are in turn advanced to individuals and firms which need them for

investment purposes. Banks gain majority of their revenues through lending and this presses a lot of need to manage these loans to maintain going concern concept. Many banks offer loans through mobile phone applications such as Cooperative Bank, KCB and the loans accessed using mobile phone are increasing day after day (Andrew, 2009).

1.1.4 Commercial Banks

In the year 2017, the Kenyan banking sector comprises of CBK which regulates the activities of commercial banks in the country to ensure compliance with country's banking regulations, Kenya has a total of 43 banking institutions where 9 of them are owned by foreigners and 13 are micro finance banks, 3 CRBs, 8 non-operating bank holding companies, and 74 Forex Bureaus. Forty banking institutions in the country are privately owned with three public holdings, 25 privately owned and 15 were foreign owned. 24 were commercial banks out of 25 locally owned while 1 was mortgage financier (CBK, 2017).

According to CBK (2017), in terms of asset holding, foreign banks stood 31.7%, local private commercial banks' asset size was 64.8% while local public commercial banks account for 3.5%. The financial sector in the country is dominated by commercial banks and failure of the sector will lead to failure of the economy and economic development in the country. Bank runs, financial crisis would be the result of any bankruptcy that could happen in financial sector. Majority of banks posting high revenues in the country are owned by foreigners.

1.2 Research Problem

The commercial banks face many challenges with the major one being default. Banks earn majority of their incomes from interests from the loans advanced to their clients. This forces the banking institutions to come up with measures to help reduce default risk. The measures have gradually changed over the last two decades both locally and internationally. The common technique that has been applied by banking institutions to reduce credit risk has been the use of guarantors to reduce this liability. This technique has hindered many people from accessing funds from financial institutions as their requests are denied if they don't have guarantors. Nowadays banking institutions conduct various monitoring activities to keep up with changing market dynamics which affect loan performance (Radevic & Ahmedin, 2010).

Various studies have been carried out on the study topic both globally and locally: Globally, Kajewski (2014) studied financial innovations focusing on benefits, challenges and recommendations for practice in Australia in the banking sector and found out that the banks had progressively invested in technology to improve financial access to their clientele. Nader (2011) assessed the impact of banking innovations on profitability of banking institutions in Saudi Arabia and established that the use of mobile phone in banking, ATM networks and presence of branch networks positively impacted the profits and the efficiency of the banks in Saudi Arabia. Mabrouk and Mamoghli (2010) investigated the financial innovation and performance of banks in Malaysia and discovered that the first mover of the innovation in products increase the profits while the innovation in the process positively affected both the profits and banks became more efficient.

Locally, Mabwai (2016) studied the impact of M-banking on profitability of firms in financial sector in Kenya and findings indicated that M-banking increased money velocity, capital adequacy, market share and size of the assets revealed an existence of direct correlation among the study variables. Daniel (2015) looked at correlation linking mobile banking to financial inclusion in Kenya and found out that that mobile money transfer services has direct correlation to financial inclusion. Kinoti (2015) sought to determine the impact of NPLs on the size of loan portfolio among Kenyan banking institutions where the study findings revealed an existence of a strong inverse association linking the study variables. Further the study discovered that there is a positive and strong association linking volume of deposits to loan portfolio. Manali (2014) studied the advantages and disadvantages of M-banking among commercial banks in Kenya where the study asserted that the advantages of M-banking include; increased access of banking services particularly to the unbanked population while the major disadvantage is the issue of security to the clients. Kithinji (2010) analyzed the impact of credit risk management on the turn-over of financial institutions in Kenya and revealed that the bulk of the profits of majority of banking institutions in Kenya as the study revealed existence of no correlation among the study variables. This research aimed at bridging the gap on correlation linking mobile banking and loans granted by commercial banks in Kenya. To achieve this study therefore, aimed at answering the question: What are the effects of mobile banking on loans granted by commercial banks in Kenya?

1.3 Objective of the Study

To determine the effect of mobile banking on loans granted by commercial banks in Kenya.

1.4 Value of the Study

The study would be beneficial to both existing and potential investors in the banking sector.

To the academicians and researchers, the study would also contribute to the existing literature under the study topic. This study would form basis for further research for those interested in carrying out further research on the study topic.

To government agencies like CBK, the study findings would assist in designing appropriate policy for mobile banking adopted by commercial banks in Kenya. The study findings would help the policy makers who are interested in improving the performance of the banking sector.

For the managers of commercial banks, the study would be of great importance as it focuses on the effect of mobile banking on loans and advances. It would inform them the effect of mobile banking on loans and advances to customers. The managers would be able to mitigate the problems of adverse selection and moral hazard hence makes informed lending decision. To the banks, the study would help them in understanding the cost saving opportunities and the competitive advantages.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter looks at the theories that informed the study. Literature on determinants of loans granted by firms on the banking sector is also discussed. The past empirical studies relevant to the current study are also reviewed and presented. The conceptual framework showing a link between the study variables is also presented.

2.2 Theories

This section explores in depth the concept of mobile banking. This section consists of portfolio theory which deals with the alignment of risk and return of portfolios. It also reviews the information theory which attempts to screen the borrowers before making loan decisions. It also reviews the transaction cost theory.

2.2.1 Portfolio Theory

This theory looks at the mixture of securities which maximizes the returns of a portfolio for a given set and at the same reducing the expected risks pertaining to a particular portfolio. Though this theory practice is common particularly among many financial analysts and it has been around for a long time, the basis portfolio theory has come under numerous criticisms in recent years particularly from economist in financial economics (Markowitz, 1952).

This theory was put forward in mid-90's all the way to late 90's and was applauded by many scholars and stakeholders in the financial sector as a major invention and

breakthrough in mathematics and scientific field. A number of criticisms have however emerged against the theory. This is due to the fact that preceding theories failed to address the risks and returns associated with particular portfolio as the associations in many times failed to hold particularly the Gaussian distribution which was commonly used by any investors (Micheal & Sproul, 1998).

2.2.2 Information Theory

This theory was developed by Derban, Binner and Mullineux (2005). They suggested that borrowers should be thoroughly screened to reduce the number of defaulters. Gathering sufficient information pertaining to a particular borrower is vital reducing the number of non-performing loans.

The other methods which can be used in analyzing borrowers is qualitative and quantitative methods though the former is subjective in nature. Though the quantitative methods can be given numeric values which are then compared with the set threshold (Derban et al., 2005). Quantitative method is preferred due to the fact that its less costly compared to other methods though its time consuming. The techniques could be more useful if they could entail variations in the levels of risks associated with a given portfolio. Brown (1998) reiterated that quantitative method provides additional information pertaining the borrower hence proving vital in establishing risky borrowers as well as safe ones which reduces the number of non-performing loans by a large extent.

2.2.3 Transaction Cost Theory

This is one of the most important organizational theories therefore many studies have been encouraged through it and it remains one of the main perspectives in organizational studies. According to Williamson (1996) transaction cost theory covered three fields including law, finance and management. The theory was developed by Cyert and March in the year 1963. This theory has become a foundation in the economics and financial fields. The developers of this theory viewed a firm not only as an organization which engages in activities of maximizing profits but to factor in the views of people involved in that particular organization. This theory asserts that organizations have witnessed high growth to the extent of substituting markets in an effort to ascertaining the level of resources to be allocated. The amount incurred by firms in closing various projects has continued to rise with time. Many of these costs are external factors which the firms have no control over them. However, these costs are eliminated within the firm operations as the firm management has control over them (Coase, 1937). Many banks incur these costs due to the cash used to gain information from external sources, as well as establishing the ways of accessing funds at minimal rates and negotiation costs which are incurred when entering into a contract with an external party, and the lastly in ensuring the firm complies with laws and regulations governing a particular area or region.

Therefore, it's the duty of the firm to ensure many transactions are internalized to cut down transactional costs. This ensures stability in the firm goods and services pricing levels which in turn improves the company remains competitive. This cuts the costs incurred from the company suppliers. Cutting these transactional costs ensures the firms' prices of goods

and services remain competitive in the market. Removing such costs boosts company revenues in both short and long run. It's cheaper for firms to carrying out transactions in the market by themselves rather than engaging another firm to do it for them. This is common in petroleum firms which carry out most of their transactions by themselves from exploration since it reaches the retailer in order to cut down costs. Banking institutions have embarked on reducing transaction costs by increasing their client base through targeting unbanked people particularly those on the rural areas and adoption of modern technologies like M-banking.

2.3 Determinants of Loans

The lending decision and the loan portfolio of any commercial banks will be dictated by bank decisions. The size, nature, and the structure of loan portfolio of commercial banks is determined by the following factors.

2.3.1 The Size of the Bank

This is very vital in determining the size of the loan to lend. It's normally measured by its assets. Further, it also restricts the potential market for borrowers such that if a financial institution is small and therefore its geographical coverage is small, its bank decision will differ from. In the case of multinational financial decisions, the loaning decisions will be large extents depend on the business potential on the areas of its coverage. The small financial institutions should therefore consider their local community and immediate environment when drawing up the bank decisions. Multinationals will consider a wider environment in which they do business (George & Simonson, 2000).

The natural log of assets is usually the common measure of size on most studies. The banks effectiveness and efficiency are related to total assets. Large banks enjoy economies of scale including accessibility to financial resources and the ability to diversify risks (Aladwan, 2015).

2.3.2 Bank Ownership

Bank ownership has a great impact on the composition of loan portfolio of the banks. Foreign banks and local banks do not make decisions on lending in using the same procedure. According to Berger and Udell, (1995) domestic and foreign bank has diversified target customers. Local banks consider the needs of the local clients whom they base their decisions due to their longstanding relations. They use their relation to determine whether the client is in a position to repay the outstanding loan amount or not. Foreign banks on the other hand face challenges in understanding the clients due to lack of any relation with local clients. They in turn use the existing standardized market rates to determine interest rates to be charge. Such techniques to assess the credit worthiness usually use information such as ratios obtained from financial statements (Berger 2003).

2.3.3 The Legal Environment

This is a major factor influencing the composition of loans of commercial banks. Different countries have different legislation governing the way a bank lends to its clients as well as the rate applied hence this influences bank decisions pertaining to the lending rates(Berger & Udell, 2006). A crucial area pertains to the levels where a bank is declared bankrupt which are laws which define bank's credit worth. The legal aspects impacting on

composition of banking lending. In case of foreign banks, numerous regulations vary with different countries and trade block regulations. These regulations pose challenges for operations of foreign banks.

Banks are required to prepare credit policies guidelines for lending decisions and making investment which reflect a bank tolerance for risk. It is mandatory for banks to assess the risk profile of its clients prior to making a loan decision. Monitoring and other appropriate steps are necessary for banks to mitigate or control the risks associated with the loans given to firms or individuals (Basel, 1999).

2.3.4 Economic Conditions

The country's economic conditions affect the shape or the composition of the loan granted by commercial banks. It refers to the economic activities around financial institutions operating environment. Many banks are usually located in areas where economic activities are either dominated by manufacturers or service industry among others. Bank policies should therefore be tailored according to the pre-dominant business activity in the bank's environment. Of great importance here is to focus on the flow of business within this environment and design policies that are able to tap the benefits to the business. In periods of corporate bankruptcy, it is also important to notice that certain loan policies are important to help re-organize bankrupt institutions and transform them into highly profitable organizations (Dayer, 1997).

2.3.5 Collateral

This refers to the asset placed by the borrower as a cover in case where one is unable to repay the outstanding loans. According to the provisions of Central Bank, all loans offered by banks must be secured to protect the borrower's funds. The value of the security should be ascertained and title documents charged to the loan which should not exceed two-third of the value of the securities. Capital or the money personally invested into the business by the lender and represents the risk faced by the borrower in case the business is facing solvency. The lending individuals or firms expect returns of the invested funds plus capital gained and this is a major factor considered before advancing any credit (George & Simonson, 2000).

2.3.6 Expected Yield

Expected yield is the expected aggregate annual rate of return. Commercial bank like other financial institutions offer loans to the public and receive back the original principal plus interest. Lender size as well as customer size can affect loan yield. For example, large banks make loans to the large corporations and small institutions lend money to the smallest business size (Rose & Hudgins, 2008). Commercial banks are exposed to default risk, which is the possibility that the borrower is unable or unwilling to meet interest, principal or both. Default risks are usually present to some degree in all loans. The actual payment or default on loan may vary from the expected payment.

The levels of interest rates that commercial banks charge on loans determine the loan portfolio. At the same time, the probability of repayment of the principal amount and the interest to a lender also determine the loan portfolio. A cost plus technique is mostly applied in pricing of loans. Further banks charge processing fees that should be paid by the borrower. The rate of interest that banks charge on the credit are varied depending on the bank's cost of funds (Moses, 2010).

2.4 Empirical Review

Various scholars have carried out research in respect to mobile banking and as a whole the financial innovations of commercial banks and how it influences the ability of banks to generate profits. Kajewski (2014) studied financial innovations focusing on benefits, challenges and recommendations for practice in Australia banking sector. The researcher used secondary data from risk manuals, financial products reports and financial reports of 38 banks which were representative of commercial banks in Australia. The study used correlation analysis, regression analysis and autocorrelation in data analysis. The researcher found out that the banks had progressively invested in technology to improve financial access to their clientele. The researcher also discovered that the number of transactions had gone up as the result of financial innovations invested by banks. The study made conclusion that financial innovations is directly linked with performance.

Nader (2011) analyzed the profit efficiency of Saudi banks in Saudi Arabia between 1998 and 2007. The research employed descriptive research design to evaluate the impact of the adoption of financial innovations among the banks in Riyadh between 2005 and 2009. The study collected data using both primary and secondary methods with the primary sources being questionnaires while secondary data was gathered from the financial and annual reports of the banks. The author established that the use of mobile phone in banking, ATM networks and presence of branch networks positively impacted the profits and the efficiency of the banks in Saudi Arabia. Conversely, the study also discovered that the presence of a high number point of sale terminals and the presence of M-banking failed to improve returns efficiency.

Mabrouk and Mamoghli (2010) investigated the financial innovation and performance of banks in Malaysia. Descriptive research design was adopted to analyze the effect of adoption of financial innovations among the banks in Kuala Lumpur between 2002 and 2009. The study variables were the two different adoption behaviors, one, the mover in the adoption of the financial innovation and secondly, imitator of the first movers. Data was gathered from 32 officials who were bank managers, using interview guides. Data were analyzed using spearman rank order correlation co-efficient. They discovered that the first mover of the innovation in products increase the profits while the innovation in the process positively affected both the profits and banks became more efficient. The institutions that imitated thereafter did not realize as much profits compared to the first movers.

Manali (2014) looked at the merits and demerits emerging from m-banking to firms in the banking sector. The design adopted was descriptive. Data collected was both primary in

nature and secondary. The researcher discovered that M-banking leads to increased sales volume, decreased operational costs and that mobile banking leads to increased customer satisfaction due to diversified products offered. And the study asserted that the disadvantages associated with M-banking in the country is clients having issue with the security of their funds, challenges faced in accessing services especially where there is network problem and processing error.

Daniel (2015) looked at the association linking mobile banking to financial inclusion in Kenya. More specifically the study aimed to find out the impact of financial innovations on the profitability of firms in the banking sector. Among the variables were mobile phone, agency banking and ATM banking. The researcher adopted a descriptive research design and used the secondary data gathered for twelve-year period from 2004 to 2016. The researcher employed multiple regression analysis to establish the existence of relation linking financial inclusion and mobile banking. The study results revealed an existence of a direct correlation among the study variables. Further, the researcher discovered that mobile banking has in large extent contributed to deepening financial markets. And also found out M-banking services have contributed significantly to financial access in Kenya.

Kinoti (2015) sought to determine the impact of NPLs on loan portfolio among Kenyan banking institutions. The researcher conducted the study using a census study which included all banks operating in Kenya. Secondary data was collected. The study results indicated an existence of inverse correlation among study variables. Further the study discovered that there is a positive and strong association linking the volume of deposits to loan portfolio as well as other earning assets.

Mabwai (2016) analyzed a link between m-banking and profitability of banking institutions in Kenya. A descriptive research design was used. A total of 8 commercial banks offering mobile banking were studied. The research employed secondary data collected using banks' financial reports. The study established that there was an existence of a direct correlation among the study variables.

Kithinji (2010) assessed management of credit risk and the ability of the banks to generate profits. The data collected was secondary; Data collection covered a period of 5 years (2004-2008). The whole firms in the banking sector formed the population of interest. From the findings, there is no correlation among the study variables noting that other variables influence the profitability of banks in Kenya.

2.5 Summary of the Literature Review

There is existing literature on mobile banking, financial innovation and loan performance. Though, none provides a clear correlation linking mobile banking to loans granted by commercial banks in Kenya. The existing literature does not clearly explain how m-banking influences the granted loans by firms in the banking sector.

2.6 Conceptual Framework

Conceptual framework clearly shows how the variables are interrelated. The study consists of independent, dependent and control variables as shown in the diagram below.

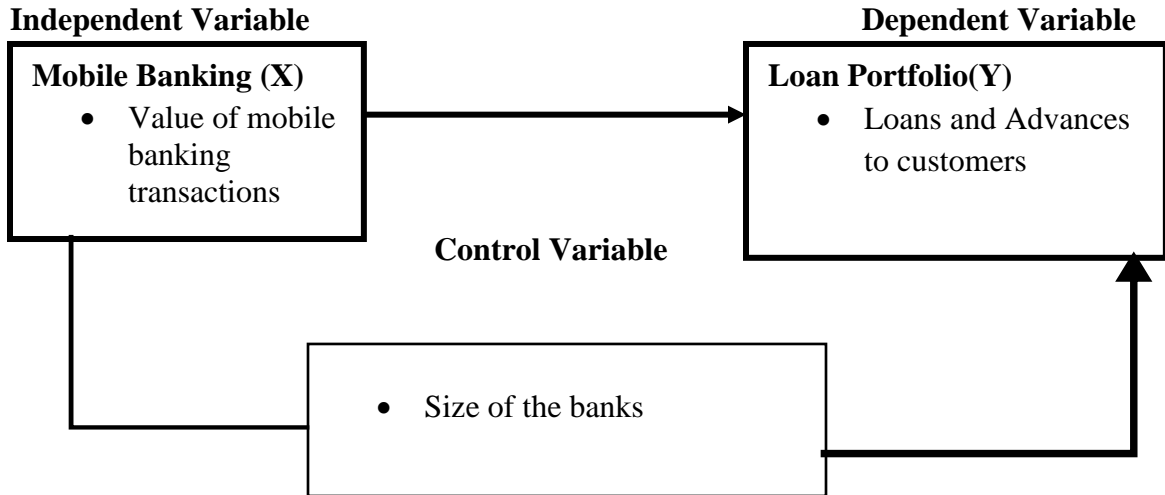


Figure 2.1: Conceptual Framework

CHAPER THREE: RESEACH METHODOLOGY

3.1 Introduction

The chapter looks at the design adopted in the study besides the population. The techniques employed in collecting information from respondents are also clearly discussed. The methods used in analyzing the collected data are also presented.

3.2 Research Design

The study design adopted was descriptive since the study sought to establish a relation linking mobile banking to loans issued by commercial banks in Kenya which will be generalized to a larger population. A descriptive research design is where the researcher has no influence over the study outcomes implying that the researcher cannot manipulate the study results. Descriptive design is more concerned with the behavior of the study variables which forms the basis for the researcher to build on the topic under (Mugenda & Mugenda, 2008).

3.3 Population of the Study

Population is the whole set of elements, events or objects with a homogeneous noticeable feature (Ngechu, 2006). A total of 43 commercial banks in operation in Kenya as of December 2017 were targeted forming the study population. The researcher collected the data using the audited financial statements of commercial banks which had offered mobile banking services in the last 10 years.

3.4 Data Collection

This involves gathering information to address the research problem. Secondary data, which are the information obtained from articles, books, newspapers, internet and magazine (Irerri, 2006) was collected. The researcher mainly used secondary data from the audited financial reports of commercial banks which had offered mobile banking services from the year 2008 to 2017.

3.5 Diagnostic Test

Specifically, normality test, multicollinearity, heteroscedasticity and autocorrelation tests were conducted. Normality test is done because it is impractical to achieve accurate and reliable deductions about the reality on whether the population from which the sample is derived is normally distributed (Ghasemi & Zahediasl, 2012). This study used Skewness and kurtosis and the graphical method to assess whether the data is normally distributed. Multicollinearity was detected using VIF; heteroscedasticity was tested using scatter plots while Durbin Watson statistics was used to test for autocorrelation.

3.6 Data Analysis

SPSS Version 23.0 was the software used for analysis. Both descriptive and regression analysis were employed in the study. To facilitate analysis data was collected systematically in a proper manner. Interpretation of p-values was done at significance level of 0.05.

3.6.1 Analytical Model

To establish the correlation linking mobile money banking to loans issued by commercial

banks in Kenya, the researcher regressed the study variables. Kigen (2010) applied this model to establish the effect of mobile banking on the transactional costs of Microfinance banks in Kenya. The model is further supported by Rachael (2014) assessing how m-banking influenced performance in the banking context. The variables to be measured in this research were the volume of mobile banking transactions, size of the banks, and loans and advances to customers. The study used this regression analysis in order to analyze the data collected.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \varepsilon$$

Where

Y is loans granted by commercial banks which are the loans and advances to customers measured by using natural log of Total loans.

X₁ is the annual amount moved through mobile banking measured using natural log of value of mobile banking transactions.

X₂ is the size of the bank measured by using the natural log of total assets of the bank.

ε is the error term.

β_0 is the constant (The values of Y when holding X values at constant)

β_1 , and β_2 are the coefficients of X₁ to X₂.

This study utilized the Fisher's one-way ANOVA statistics at 0.05 level of significance to test whether specific the regression model is significant. The t statistics was used to assess the significance of the coefficients of the regression model.

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

The chapter presents the analysis and discussions on the data that was collected. The study relied on secondary data that was collected using data collection sheet. Secondary data was collected on a ten-year period (2008 to 2017). Both descriptive and inferential statistics were employed in the analysis.

4.2 Response Rate

The study sought to collect secondary data from all 43 commercial banks. However, complete data was available from 33 commercial banks. This gave a response rate of 76.7%. The response rate was sufficient and concurred with Babbie (2015) who noted that excellent presentation of the findings, response rates should be over 70%.

4.3 Descriptive Statistics

Table 4.1 presents the descriptive analysis results of the variables of the study. The researcher used means and standard deviations to describe how m-banking influenced loans granted by commercial banks. The findings are shown in Table 4.1.

Table 4.1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Dev
Loan	330	2.40	6.43	4.10	.818
Mobile banking	330	8.16	11.99	9.63	.782
Size	330	3.36	5.70	4.52	.561

Source: (Research Findings, 2018)

From Table 4.1, mobile banking averagely stood at 9.63, bank size was at 4.52 while loans were at 4.10. There was no significant spread in mobile banking, size of the banks and loans granted by commercial banks as indicated by low values of standard deviations.

4.4 Correlation Analysis

In order to determine the relationship between the study variables, correlation analysis was employed. The findings are indicated in Table 4.2.

Table 4.2: Correlation Analysis

		Loan	Mobile banking	Size
Loan	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	330		
Mobile banking	Pearson Correlation	.481**	1	
	Sig. (2-tailed)	.000		
	N	330	330	
Size	Pearson Correlation	.666**	.469**	1
	Sig. (2-tailed)	.000	.000	
	N	330	330	330

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

Source: (Research Findings, 2018)

As shown in Table 4.2, mobile banking had $r=0.481$ $p=0.000 < 0.05$ while size of the bank had $r=0.666$, $p=0.000 < 0.05$. It can be deduced that m-banking and size are positively and significantly correlated with loans issued by the banks.

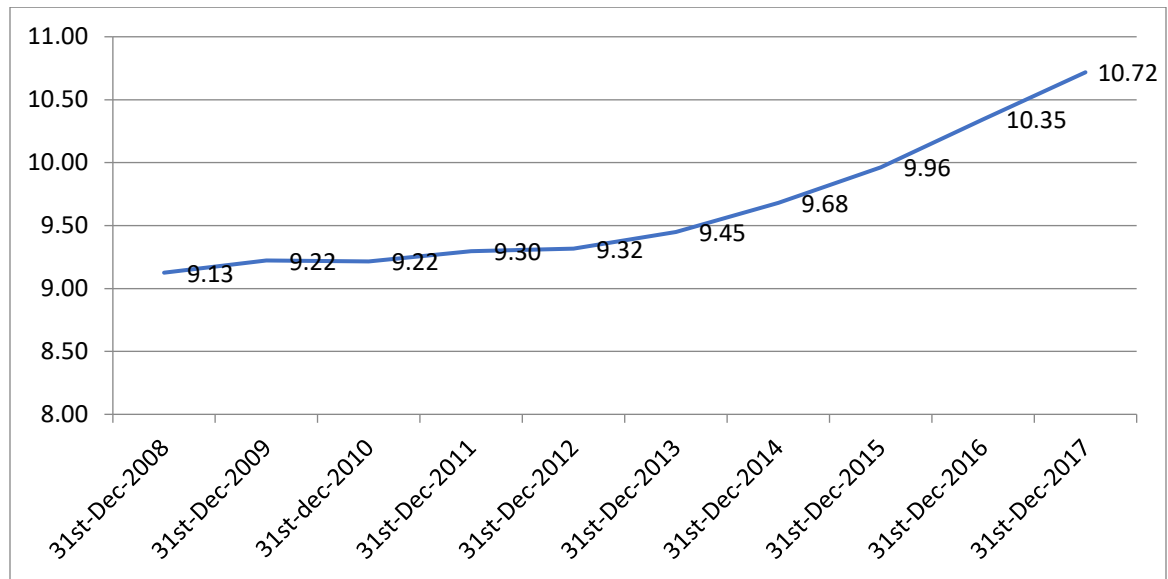
4.5 Trend Analysis

The researcher used graphs to illustrate the movement and trend in mobile banking, bank size and loans among commercial banks over a ten-year period (2008-2017). The findings are shown in subsequent sections.

4.5.1 Mobile Banking

The trend in mobile banking in the banking sector over a ten-year period of the study is shown in Figure 4.1.

Figure 4.1: Trend Analysis on Mobile Banking



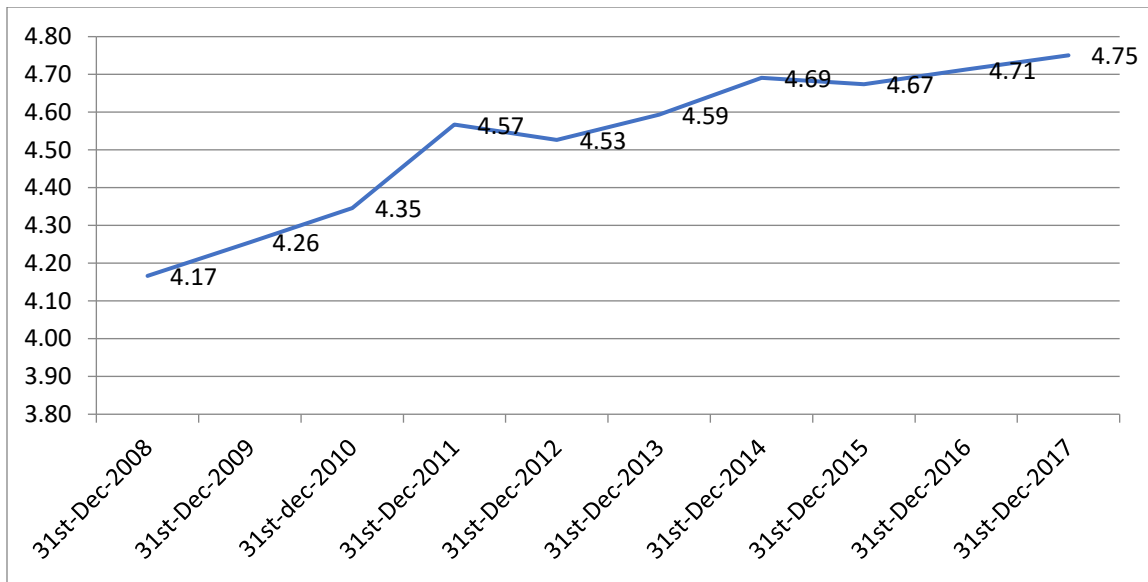
Source: (Research Findings, 2018)

From Figure 4.1, there was a consistent rise in mobile banking for the study period. This could be attributed to the benefits in terms of revenues that mobile banking channels brought. Kajewski (2014) found out that the banks had progressively invested in technology to improve financial access to their clientele and that the number of transactions had gone up as the result of financial innovations invested by banks.

4.5.2 Size of the Bank

The findings on the trend of the size of commercial banks are indicated in the figure below.

Figure 4.2: Trend Analysis on Size of the Bank



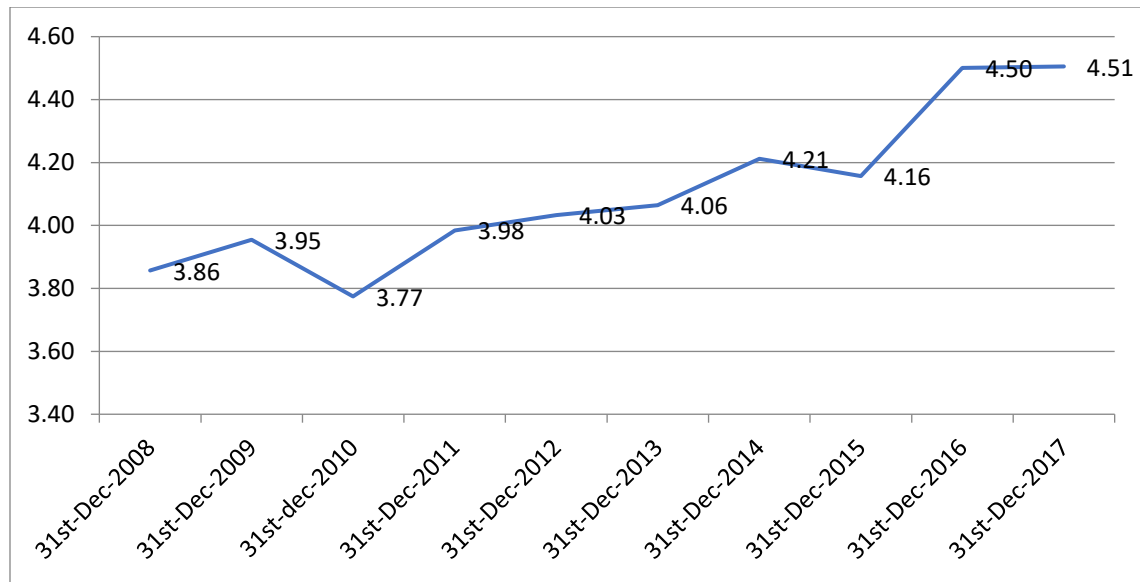
Source: (Research Findings, 2018)

From the findings in Figure 4.2, there was generally a consistent increase in sizes of commercial banks in the banking industry across the period of consideration. This could be attributed to an increase in asset base of the most commercial banks which are used for expansion. According to Aladwan (2015), the size of the bank is measured by using natural logarithm of total assets of the bank being measured.

4.5.3 Loans

Loans were the dependent variable of the study. The findings of the trend analysis on the same are shown in the figure below.

Figure 4.3: Trend Analysis on Loans



Source: (Research Findings, 2018)

Figure 4.3 shows the trend in loans granted by commercial banks over a period of 2008 all through to 2017. From the findings, there was generally a fluctuation in loans among commercial banks over the study period. This trend was attributed to changing regulatory framework especially the introduction of the interest rate capping. This assertion is supported by (Berger & Udell, 2006) who noted that legal environment is a major factor influencing the composition of loans granted by commercial banks because different countries have different legislation governing the way a bank lends to its clients as well as the rate applied hence this affects bank decisions pertaining to the lending rates.

4.6 Diagnostic Tests

The researcher ensured that the data set does not violate that assumption of regression analysis. Specifically, normality test, multicollinearity, heteroscedasticity and autocorrelation tests were conducted. The findings are shown in subsequent sections.

4.6.1 Normality Test

Normality tests were conducted to determine whether the data set was normally distributed. The researcher used Skewness and Kurtosis besides PP plots to determine normality of the data set.

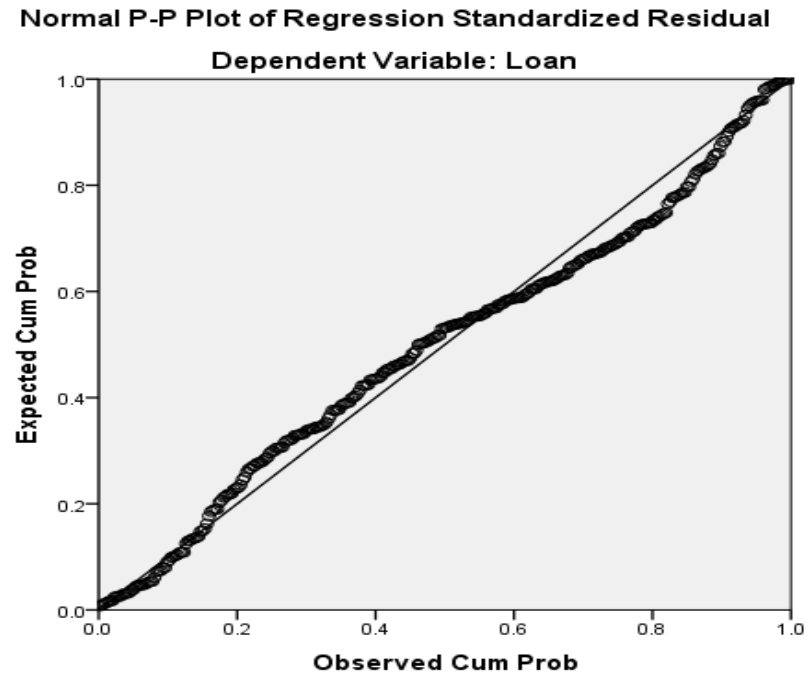
Table 4.3: Skewness and Kurtosis

	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
Loan	330	.510	.134	-.347	.268
Mobile banking	330	.618	.134	-.033	.268
Size	330	.155	.134	-1.057	.268

Source: (Research Findings, 2018)

Table 4.3 presents the values of Skewness and Kurtosis used to determine whether the data set was normally distributed. From the findings, all the values of Skewness and Kurtosis of the respective study variables were within range of +2 and -2. This shows that the data set was normally distributed. These findings are further illustrated in the figure below.

Figure 4.4: Normal PP Plot



Source: (Research Findings, 2018)

Figure 4.4 is the PP plots used to determine whether the data set was normally distributed. From the findings, the data points lie along the PP line showing that the data set was normally distributed.

4.6.2 Multicollinearity Test

Multicollinearity was used to determine whether any of the variables in the model were highly correlated. This was determined using Variance of Inflation Factor (VIF) in the table below.

Table 4.4: Multicollinearity Test

	Collinearity Statistics	
	Tolerance	VIF
Mobile Banking	.780	1.282
Bank Size	.780	1.282

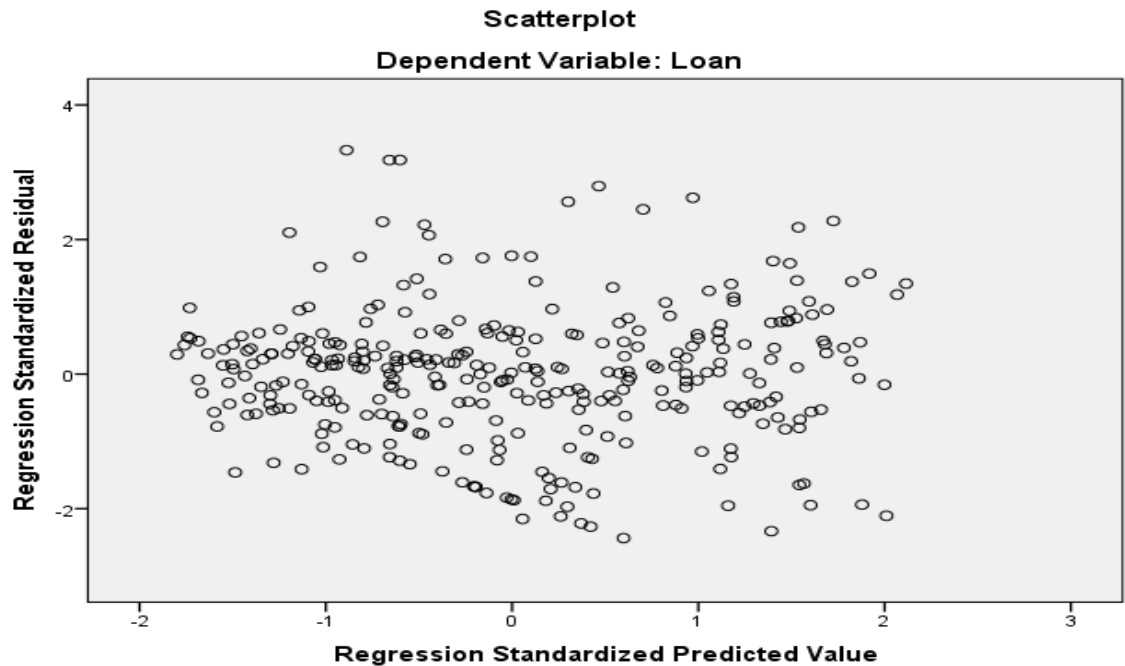
Source: (Research Findings, 2018)

The table above displays the Variance of Inflation factors of the study variables. From the findings, all the VIF values are within the range of 1-10, showing that there was no multicollinearity in the data set.

4.6.3 Heteroscedasticity

Heteroscedasticity was detected using Scatter plots shown in the figure below.

Figure 4.5: Scatter Plot



Source: (Research Findings, 2018)

From the findings, the data points in the scatter plots are spread all over with no distinct clear pattern. This indicates that there was no heteroscedasticity in the data set.

4.6.4 Autocorrelation Test

To detect autocorrelation in the data, Durbin Watson statistics was used. The findings are presented in the table below.

Table 4.5: Autocorrelation Test

Model	Durbin-Watson
1	2.339

a. Predictors: (Constant), Bank Size, Mobile Banking
 b. Dependent Variable: Loans

Source: (Research Findings, 2018)

From table above, the value of Durbin Watson statistic is so close to 2, which implies that there was no autocorrelation in the data set. Thus, the data set does not violate any regression assumption hence further inferential statistics were done including regression analysis.

4.7 Regression Analysis

The objective of the study was to determine the effect of mobile banking on loans granted by commercial banks in Kenya. To accomplish this, the researcher carried out regression analysis which gives the relation between the variables under study after ensuring that the data set was suitable for inferential analysis. The data used was collected for 10 years which facilitated linear regression analysis. The findings are shown in subsequent sections.

4.7.1 Model Summary

The Model Summary shown in Table 4.5 indicates the values for the coefficients of correlation R which is the measure of relation between dependent, independent and control variables, coefficient of determination R square which is the measure of the extent at which the independent and control variables influence on the dependent variable and adjusted R square which is measures the reliability of regression results.

Table 4.6: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.693 ^a	.480	.477	.59218

a. Predictors: (Constant), Bank Size, Mobile Banking

Source: Research Data

From Table 4.6, coefficients of correlation R value is 0.693 (69.3%) which shows that there is a strong and positive relation between the dependent variable (loans) and the independent and control variables (mobile banking and size of the banks). The coefficient of determination R square is 0.480, this shows that 48% change in loans granted by commercial banks is explained the mobile banking and size of the banks. Thus, there exist other factors that influence loans granted by commercial banks by 52% which future studies should focus on.

4.7.2 Model Fitness

An Analysis of Variance (ANOVA) was conducted at 5% level of significance to determine whether the overall model was fit. The findings are indicated in the table below.

Table 4.7: Model Fitness

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	105.786	2	52.893	150.829	.000 ^b
Residual	114.673	327	.351		
Total	220.458	329			

a. Dependent Variable: Loans

b. Predictors: (Constant), Bank Size, Mobile Banking

Source: Research Data

From the table above the value of F calculated is 150.829. On the other hand, the value of F critical (at degrees of freedom 2, 327) is 3.023. It is therefore clear that the value of F calculated is more than F critical. This finding has an overall implication that the model used in the study was fit.

4.7.3 Regression Coefficients

The regression coefficients were calculated in order to answer the proposed model for the relation between loans granted by commercial banks and mobile banking and size of the banks. Table 4.8 gives the p-values of the variables of the study that determine significance. The p values were interpreted at 5% level of significance (0.05).

Table 4.8: Regression Coefficients

	Unstandardized		Standardized	t	Sig.
	Coefficients		Coefficients		
	B	Std. Error	Beta		
(Constant)	1.803	.412		4.376	.000
Mobile Banking	.227	.047	.217	4.800	.000
Bank Size	.822	.066	.564	12.494	.000

a. Dependent Variable: Loans

Source: Research Data

From the findings in Table 4.8, the following regression model is established;

$$Y = 1.803 + 0.227X_1 + 0.822X_2$$

Where Y is loans

X₁ is the annual amount moved through mobile banking

X₂ is the size of the bank

Thus, all factors held constant, loans granted by commercial banks would be at 1.810.

Mobile banking ($\beta=0.227$, $p=0.000$) had a positive and significant influence on loans. Size of the bank ($\beta=0.822$, $p=0.000$) had a positive and significant effect on loans granted by commercial banks.

4.8 Research Findings

The study revealed that mobile banking had a positive and significant influence on loans. Daniel (2015) looked at the association linking mobile banking to financial inclusion in Kenya and revealed that mobile banking has in large extent contributed to deepening financial markets. It was established that m-banking services have contributed significantly to financial access in Kenya. Similarly, Kajewski (2014) established that financial innovations have a direct impact on the profitability of banks as it reduced the cost of service delivery to the customers.

Size of the bank had a positive and significant effect on loans granted by among commercial banks. According to George and Simonson (2000), size of the bank is very vital in determining the size of the loan to lend by restricting the potential market for borrowers such that if a financial institution is small and therefore its geographical coverage is small, its bank decision will differ from.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of the analyzed findings besides the conclusion. The recommendations informed by the findings of the study are also presented. The limitations of the study are pointed out. Suggestions for further studies to future scholars and academicians are also clearly presented.

5.2 Summary of the Findings

The aim of the study was to determine the effect of mobile banking on loans granted by commercial banks in Kenya. The study was guided by the Portfolio Theory, Information Theory and the Transaction Cost Theory. A descriptive design was adopted and the population comprised of 43 commercial banks. A census was as the population was small for sampling.

The findings from descriptive statistics indicated that there was no significant spread in mobile banking, size and loan portfolio among commercial banks as indicated by low values of standard deviation. From the trend analysis, there was stability in mobile money over the study period. There was generally a consistent increase in sizes of commercial banks in the banking industry across the period of consideration. There was generally a fluctuation in loans granted by commercial banks over the study period.

The study realized the need for diagnostic tests before carrying out inferential analysis. This ensured that the data set did not violate any of the regression assumptions. In

particular, the study carried out normality test, multicollinearity test, autocorrelation tests and heteroscedasticity test. All the values in the above tests were within the prescribed thresholds and thus the data set was suitable for further regression analysis.

Regression results showed the coefficient of determination R square of 0.480, which implies that 48.0% change in loans granted by commercial banks is explained by M banking. At 5%, an ANOVA was conducted and it was confirmed through comparison of **F** calculated (150.829) and **F** critical (3.023) that the overall regression model was significant. A detailed analysis of the p values of each individual variables of the study indicated that at 5% level of significance, mobile banking and size of the bank had a direct and significant effect on loans granted by commercial banks.

5.3 Conclusion

The study concludes that mobile banking has a positive and significant influence on loans. This indicates that an increase in m-banking would result into improvement in loans granted by commercial banks. Manali (2014) discovered that M-banking leads to increased sales volume, decreased operational costs and that mobile banking leads to increased customer satisfaction due to diversified products offered.

The study also concludes that size of the bank has a positive and significant effect on loans granted by commercial banks. This implies that larger banks have greater loan portfolio as compared to smaller ones. According to George and Simonson (2000), small financial institutions should therefore consider their local community and immediate environment

when drawing up the bank decisions while Multinationals will consider a wider environment in which they do business.

5.4 Recommendations of the Study

The study recommends that the top management team of all commercial banks should increase investment in M-banking to positively influence loans of their companies. The management team of all commercial banks should further employ more sales force to increase awareness on the use of m-banking channels so as to positively grow loans.

The Central Bank of Kenya (CBK) should come up with sound regulations that encourage the adoption and use of m-banking platforms among commercial banks for growth in loans granted by commercial banks. The government should speed up the process of repealing the removal of the interest capping in order to improve on the loans granted by commercial banks.

Commercials in Kenya should invest in projects that would increase their volume of assets and thus significantly influencing their ability to grant loans to customers. By growing the volume of assets size would definitely increase transpiring into greater ability to grant loans to customers.

Firms in the financial industry including MFIs and deposit taking SACCOs should invest in mobile banking platforms in order to increase their ability to extend loans to their customers. The management of these firms should also seek to increase their size by opening up more branches for positive growth in loans that they issue to customers.

5.5 Limitations of the Study

The current study was limited on secondary data that was collected from the Central Bank supervision Reports. The study sought to collect secondary data from all the 43 commercial banks in Kenya. Secondary unlike primary data however is the second hand information that may be prone to biasness. Data was on some variables like mobile banking could only be available as an aggregate of the entire banking sector and not on every specific commercial bank in the Central Bank Supervision Report. Thus, data was collected on individual basis from 33 commercial banks whose data was available.

The study was only limited to a ten-year period (2008-2017). This period was relevant because significant events including electioneering and changing regulatory environments including the passing of the interest capping have occurred in the banking sector. Commercial banks have also made significant investment in innovations across this period.

The study was limited to commercial banks in Kenya. In total, 43 commercial banks were covered. Commercial banks are in the larger financial industry. There are other firms including Micro Finance Institutions (MFIs), deposit and non-deposit taking SACCOs besides forex bureaus.

The study was further limited to a descriptive research design. There are however different types of designs including exploratory and causal. In casual design, the aim is to test hypothesis so as to establish the cause effect relationship and link between the study variables. The type of design determines overall methods to use in collection and analysis of the data.

The study was limited to three variables that is the independent, the dependent and the control variables. There are however other types of variables including the intervening and moderating variables. To achieve any objective in a study, variables should be in place.

5.6 Suggestions for Further Studies

The current study was limited to secondary data. The key challenge of secondary data is that it does not represent the first hand source of information unlike primary data. To overcome this limitation of secondary data, future studies should supplement these sources on information. The model summary indicated an R square of 48.0% showing that there exist other factors apart from mobile banking that influence loans granted by commercial which future studies should focus on.

The study focused on commercial banks in Kenya. In total, 43 commercial banks were studied. Future studies should consider comparative analysis to cover other institutions including MFIs and SACCOs. This would facilitate comparison of the findings and thus informed decision making among policy makers in the industry. At the same time, future studies can be carried out with specific focus on only listed commercial banks in Kenya.

There are three major types of research design that studies can employ; descriptive, causal and exploratory. The current study focused on descriptive design. However, future similar studies should adopt the use of causal design that covers hypotheses. Formulation of hypotheses will explore relationship between the variables.

The current study focused on three variables, the independent, the control and the dependent variable. The independent variable was mobile banking, size was the control variable while loans issued was the dependent variable. Future studies should relate mobile banking and financial performance as the dependent unlike loans granted. At the same time, the issue of Non-performing loans has been on a rise among commercial banks. Thus, instead of examining loans granted in totality, future studies should focus on NPLs.

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APPENDICES

APPENDIX I: LIST OF COMMERCIAL BANKS

1. African Banking Corporation Limited
2. Bank of Africa Kenya Limited
3. Bank of Baroda (K) Limited
4. Bank of India
5. Barclays Bank of Kenya Limited
6. Charterhouse Bank Limited (under statutory management)
7. Chase Bank (K) Ltd
8. Citibank N.A Kenya
9. Commercial Bank of Africa Kenya Limited
10. Co-operative Bank of Kenya Limited
11. Consolidated Bank of Kenya Limited
12. Credit Bank Limited
13. Development Bank of Kenya Limited
14. Diamond Trust Bank Kenya Limited
15. DBI Kenya Limited
16. Ecobank Kenya Limited
17. Equity Bank Limited
18. Family Bank Limited
19. First community Bank Limited
20. Guaranty Trust Bank (K) Ltd
21. Guardian Bank Ltd
22. Gulf African Bank Limited
23. Habib Bank A.G Zurich
24. Imperial Bank Limited (in receivership)
25. I &M Bank Limited
26. Jamii Bora Bank Limited
27. Kenya Commercial Bank (KCB) Limited
28. Mayfair Bank Limited

29. Middle East Bank (K) Ltd
30. M-Oriental Bank Limited
31. National Bank of Kenya Limited
32. NIC Bank Kenya Plc
33. Paramount Bank Limited
34. Prime Bank Limited
35. SBM Bank Kenya Limited
36. Sidian Bank Limited
37. Spire Bank Limited
38. Stanbic Kenya Limited
39. Standard Chartered Bank Kenya Limited
40. Trans-National Bank Limited
41. UBA Kenya Bank Limited
42. Victoria Commercial Bank Ltd
43. Housing Finance Limited (H F C Limited)

(Source: CBK, 2018)

APPENDIX II: DATA COLLECTION FORM

Variable	Measurement	Period 2008 – 2017				
X1 value of M-banking transactions	Natural Log of Value of M-banking transactions					
X2 size of the bank	Natural log of the Total Assets of the Banks					
Y Loan portfolio	Natural log of Total loans					

APPENDIX III: RAW DATA

Year	Institution	Loans	Mobile Banking	Bank Size
2008	Kenya Commercial Bank Ltd	4.9	9.47	5.24
2008	Barclays Bank of Kenya Ltd	5.03	9.87	5.23
2008	Standard Chartered Bank Ltd	4.64	10.27	5
2008	Cooperative Bank of Kenya Ltd	4.73	9.88	4.92
2008	CFC Stanbic Bank Ltd	4.65	9.08	4.92
2008	Equity Bank Ltd	4.61	10.22	4.89
2008	Commercial Bank of Africa Ltd	4.42	8.65	4.7
2008	National Bank of Kenya Ltd	4.26	8.21	4.68
2008	Citibank N.A.	4.48	9.02	4.63
2008	Diamond Trust Bank Ltd	3.95	9.33	4.63
2008	NIC Bank Ltd	4.41	9.17	4.62
2008	I&M Bank Ltd	4.41	8.79	4.56
2008	Prime Bank Ltd	3.97	9.32	4.3
2008	Bank of Baroda Ltd	3.84	8.91	4.09
2008	Bank of Africa Ltd	3.65	8.89	4.08
2008	Bank of India	3.71	9.13	4.02
2008	Ecobank Ltd	3.77	9.38	4.02
2008	Family Bank Ltd	3.79	8.46	3.99
2008	Fina Bank Ltd	3.77	9.14	3.91
2008	African Banking Corporation Ltd	3.55	8.97	3.82
2008	Gulf African Bank Ltd	3.34	8.46	3.82
2008	Habib AG Zurich	3.53	8.86	3.77
2008	K-Rep Bank Ltd	3.55	9.25	3.74
2008	Consolidated Bank of Kenya Ltd	3.29	9.47	3.7
2008	Guardian Bank Ltd	3.44	8.43	3.67
2008	Fidelity Commercial Bank Ltd	2.99	8.65	3.65
2008	Victoria Commercial Bank Ltd	3.44	8.95	3.65
2008	Habib Bank Ltd	3.36	8.44	3.64
2008	Equatorial Commercial Bank Ltd	3.45	8.51	3.64
2008	First Community Bank Ltd	3.26	8.64	3.56
2008	Credit Bank Ltd	3.16	9.45	3.53
2008	Trans-National Bank	2.94	9.8	3.5
2008	Oriental Commercial Bank Ltd	2.98	10.08	3.36
2009	Kenya Commercial Bank Ltd	4.98	9.56	5.24
2009	Barclays Bank of Kenya Ltd	4.97	9.97	5.22
2009	Standard Chartered Bank Ltd	4.75	10.37	5.09
2009	Cooperative Bank of Kenya Ltd	4.79	9.98	5.04
2009	CFC Stanbic Bank Ltd	4.65	9.18	4.99

2009	Equity Bank Ltd	4.78	10.32	4.98
2009	Commercial Bank of Africa Ltd	4.48	8.75	4.76
2009	National Bank of Kenya Ltd	4.12	8.3	4.71
2009	Citibank N.A.	4.33	9.12	4.71
2009	Diamond Trust Bank Ltd	4.49	9.42	4.67
2009	NIC Bank Ltd	4.49	9.27	4.65
2009	I&M Bank Ltd	4.39	8.89	4.64
2009	Prime Bank Ltd	4.03	9.41	4.37
2009	Bank of Baroda Ltd	3.96	9.01	4.34
2009	Bank of Africa Ltd	3.96	8.99	4.23
2009	Bank of India	3.74	9.23	4.19
2009	Ecobank Ltd	3.81	9.47	4.14
2009	Family Bank Ltd	3.89	8.55	4.12
2009	Fina Bank Ltd	3.77	9.23	4.09
2009	African Banking Corporation Ltd	3.6	9.07	3.95
2009	Gulf African Bank Ltd	3.69	8.55	3.89
2009	Habib AG Zurich	3.34	8.96	3.87
2009	K-Rep Bank Ltd	3.68	9.34	3.85
2009	Consolidated Bank of Kenya Ltd	3.59	9.57	3.84
2009	Guardian Bank Ltd	3.62	8.53	3.83
2009	Fidelity Commercial Bank Ltd	3.52	8.74	3.74
2009	Victoria Commercial Bank Ltd	3.5	9.04	3.71
2009	Habib Bank Ltd	3.1	8.54	3.67
2009	Equatorial Commercial Bank Ltd	3.44	8.61	3.65
2009	First Community Bank Ltd	3.36	8.74	3.65
2009	Credit Bank Ltd	3.27	9.54	3.56
2009	Trans-National Bank	3.23	9.89	3.53
2009	Oriental Commercial Bank Ltd	3.18	10.17	3.48
2010	Kenya Commercial Bank Ltd	5.56	9.6	5.35
2010	Barclays Bank of Kenya Ltd	5.42	10.04	5.24
2010	Standard Chartered Bank Ltd	4.45	10.41	5.15
2010	Cooperative Bank of Kenya Ltd	5.18	10.04	5.19
2010	CFC Stanbic Bank Ltd	4.48	9.36	5.03
2010	Equity Bank Ltd	5.79	10.36	4.54
2010	Commercial Bank of Africa Ltd	3.95	9.1	4.8
2010	National Bank of Kenya Ltd	2.98	8.33	4.79

2010	Citibank N.A.	4.21	9.21	4.74
2010	Diamond Trust Bank Ltd	4.64	9.53	4.78
2010	NIC Bank Ltd	4.07	9.35	4.77
2010	I&M Bank Ltd	3.71	8.91	3.53
2010	Prime Bank Ltd	3.4	9.53	4.51
2010	Bank of Baroda Ltd	3.79	9.03	4.43
2010	Bank of Africa Ltd	2.86	9.03	4.73
2010	Bank of India	3.69	9.28	4.43
2010	Ecobank Ltd	4.91	9.55	4.31
2010	Family Bank Ltd	3.68	8.59	4.15
2010	Fina Bank Ltd	4.07	9.23	3.88
2010	African Banking Corporation Ltd	3.1	9.12	4.01
2010	Gulf African Bank Ltd	3.11	8.63	3.91
2010	Habib AG Zurich	3.39	9.05	4.01
2010	K-Rep Bank Ltd	2.89	9.36	3.9
2010	Consolidated Bank of Kenya Ltd	3.11	9.63	4.73
2010	Guardian Bank Ltd	4.02	8.62	4.02
2010	Fidelity Commercial Bank Ltd	2.4	8.79	3.73
2010	Victoria Commercial Bank Ltd	2.6	9.1	3.79
2010	Habib Bank Ltd	3.68	8.54	4.02
2010	Equatorial Commercial Bank Ltd	3.06	8.65	3.91
2010	First Community Bank Ltd	2.86	8.8	3.66
2010	Credit Bank Ltd	3.4	9.23	3.68
2010	Trans-National Bank	3.13	9.27	3.8
2010	Oriental Commercial Bank Ltd	2.75	8.83	3.66
2011	Kenya Commercial Bank Ltd	5.79	9.65	5.58
2011	Barclays Bank of Kenya Ltd	5.65	10.21	5.47
2011	Standard Chartered Bank Ltd	4.68	10.54	5.39
2011	Cooperative Bank of Kenya Ltd	5.41	10.1	5.42
2011	CFC Stanbic Bank Ltd	4.71	9.6	5.26
2011	Equity Bank Ltd	6.02	10.41	4.64
2011	Commercial Bank of Africa Ltd	4.18	9.18	5.03
2011	National Bank of Kenya Ltd	3.21	8.36	5.02
2011	Citibank N.A.	4.44	9.48	4.97
2011	Diamond Trust Bank Ltd	4.87	9.59	5.01
2011	NIC Bank Ltd	4.3	9.42	5
2011	I&M Bank Ltd	3.94	9.09	4.37
2011	Prime Bank Ltd	3.63	9.63	4.74

2011	Bank of Baroda Ltd	4.02	9.04	4.66
2011	Bank of Africa Ltd	3.09	9.04	4.82
2011	Bank of India	3.92	9.37	4.66
2011	Ecobank Ltd	5.14	9.6	4.54
2011	Family Bank Ltd	3.91	8.62	4.38
2011	Fina Bank Ltd	4.3	9.33	4.12
2011	African Banking Corporation Ltd	3.33	9.17	4.24
2011	Gulf African Bank Ltd	3.34	8.66	4.14
2011	Habib AG Zurich	3.62	9.07	4.24
2011	K-Rep Bank Ltd	3.12	9.42	4.14
2011	Consolidated Bank of Kenya Ltd	3.34	9.65	4.64
2011	Guardian Bank Ltd	4.25	8.74	4.25
2011	Fidelity Commercial Bank Ltd	2.63	8.85	3.96
2011	Victoria Commercial Bank Ltd	2.83	9.14	4.02
2011	Habib Bank Ltd	3.91	8.63	4.25
2011	Equatorial Commercial Bank Ltd	3.29	8.74	4.14
2011	First Community Bank Ltd	3.09	8.83	3.89
2011	Credit Bank Ltd	3.63	9.46	3.91
2011	Trans-National Bank	3.36	9.67	4.04
2011	Oriental Commercial Bank Ltd	2.98	8.51	3.89
2012	Kenya Commercial Bank Ltd	5.34	9.65	5.48
2012	Barclays Bank of Kenya Ltd	5.89	10.21	5.33
2012	Standard Chartered Bank Ltd	5.41	10.54	5.3
2012	Cooperative Bank of Kenya Ltd	4.58	10.1	5.29
2012	CFC Stanbic Bank Ltd	5.44	9.6	5.27
2012	Equity Bank Ltd	4.49	10.41	5.13
2012	Commercial Bank of Africa Ltd	4.41	9.18	5.01
2012	National Bank of Kenya Ltd	4.11	8.36	4.98
2012	Citibank N.A.	4.95	9.48	5
2012	Diamond Trust Bank Ltd	3.85	9.59	4.96
2012	NIC Bank Ltd	3	9.42	4.84
2012	I&M Bank Ltd	4.8	9.09	4.83
2012	Prime Bank Ltd	3.3	9.63	4.66
2012	Bank of Baroda Ltd	4.11	9.04	4.69
2012	Bank of Africa Ltd	3.48	9.04	4.64
2012	Bank of India	5.04	9.37	4.49

2012	Ecobank Ltd	3	9.6	4.4
2012	Family Bank Ltd	4.56	8.62	4.5
2012	Fina Bank Ltd	3.3	9.33	4.28
2012	African Banking Corporation Ltd	3.3	9.17	4.23
2012	Gulf African Bank Ltd	4.11	8.66	4.26
2012	Habib AG Zurich	3.7	9.07	4.13
2012	K-Rep Bank Ltd	3.7	9.42	4.15
2012	Consolidated Bank of Kenya Ltd	3	9.65	4.07
2012	Guardian Bank Ltd	3	8.74	4.07
2012	Fidelity Commercial Bank Ltd	3.64	8.85	4.01
2012	Victoria Commercial Bank Ltd	3.82	9.14	3.99
2012	Habib Bank Ltd	4.67	8.63	3.98
2012	Equatorial Commercial Bank Ltd	3.6	8.74	3.94
2012	First Community Bank Ltd	3.3	8.83	4
2012	Credit Bank Ltd	3.64	9.46	3.85
2012	Trans-National Bank	3.27	9.67	3.79
2012	Oriental Commercial Bank Ltd	3.3	8.51	3.81
2013	Kenya Commercial Bank Ltd	5.32	10.27	5.51
2013	Barclays Bank of Kenya Ltd	5.92	10.29	5.38
2013	Standard Chartered Bank Ltd	5.54	10.65	5.36
2013	Cooperative Bank of Kenya Ltd	4.71	10.22	5.34
2013	CFC Stanbic Bank Ltd	5.45	9.75	5.32
2013	Equity Bank Ltd	4.53	10.65	5.23
2013	Commercial Bank of Africa Ltd	5.95	9.33	5.1
2013	National Bank of Kenya Ltd	4.15	8.67	5.06
2013	Citibank N.A.	3.9	10.56	5.04
2013	Diamond Trust Bank Ltd	4.41	9.74	5.05
2013	NIC Bank Ltd	4.88	9.48	4.97
2013	I&M Bank Ltd	3	9.11	4.85
2013	Prime Bank Ltd	3.3	9.8	4.72
2013	Bank of Baroda Ltd	4.2	9.11	4.72
2013	Bank of Africa Ltd	3.6	9.11	4.69
2013	Bank of India	4.99	9.55	4.64
2013	Ecobank Ltd	3	9.71	4.49
2013	Family Bank Ltd	4.11	8.77	4.57
2013	Fina Bank Ltd	3	9.4	4.41
2013	African Banking Corporation Ltd	3.3	9.24	4.29

2013	Gulf African Bank Ltd	3.7	8.74	4.21
2013	Habib AG Zurich	3.78	9.18	4.19
2013	K-Rep Bank Ltd	3.37	9.46	4.13
2013	Consolidated Bank of Kenya Ltd	4	9.71	4.22
2013	Guardian Bank Ltd	4.67	9.07	4.12
2013	Fidelity Commercial Bank Ltd	3	9.01	4.11
2013	Victoria Commercial Bank Ltd	3.3	9.21	4.11
2013	Habib Bank Ltd	3.09	8.89	4.04
2013	Equatorial Commercial Bank Ltd	3.3	8.89	4.05
2013	First Community Bank Ltd	4.46	9.03	3.98
2013	Credit Bank Ltd	3.64	10.24	3.91
2013	Trans-National Bank	3.09	8.58	3.85
2013	Oriental Commercial Bank Ltd	3.3	8.16	3.86
2014	Kenya Commercial Bank Ltd	5.44	10.5	5.58
2014	Barclays Bank of Kenya Ltd	5.63	10.52	5.45
2014	Standard Chartered Bank Ltd	5.95	10.88	5.44
2014	Cooperative Bank of Kenya Ltd	5.46	10.45	5.35
2014	CFC Stanbic Bank Ltd	4.78	9.98	5.35
2014	Equity Bank Ltd	6.27	10.88	5.25
2014	Commercial Bank of Africa Ltd	4.61	9.56	5.23
2014	National Bank of Kenya Ltd	4.08	8.9	5.15
2014	Citibank N.A.	4.43	10.79	5.14
2014	Diamond Trust Bank Ltd	4	9.97	5.14
2014	NIC Bank Ltd	5.1	9.72	5.09
2014	I&M Bank Ltd	3	9.34	4.9
2014	Prime Bank Ltd	5.17	10.03	4.79
2014	Bank of Baroda Ltd	3.3	9.34	4.79
2014	Bank of Africa Ltd	4.3	9.34	4.79
2014	Bank of India	4.08	9.78	4.75
2014	Ecobank Ltd	3.6	9.94	4.74
2014	Family Bank Ltd	4	9	4.66
2014	Fina Bank Ltd	3	9.63	4.54
2014	African Banking Corporation Ltd	3.3	9.47	4.52
2014	Gulf African Bank Ltd	5.65	8.97	4.3
2014	Habib AG Zurich	3.04	9.41	4.33
2014	K-Rep Bank Ltd	3.78	9.69	4.24
2014	Consolidated Bank of Kenya Ltd	3.48	9.94	4.2
2014	Guardian Bank Ltd	4.56	9.3	4.22
2014	Fidelity Commercial Bank Ltd	3	9.24	4.22
2014	Victoria Commercial Bank Ltd	4.32	9.44	4.18

2014	Habib Bank Ltd	3.85	9.12	4.16
2014	Equatorial Commercial Bank Ltd	3.48	9.12	4.18
2014	First Community Bank Ltd	3	9.26	4.08
2014	Credit Bank Ltd	3.85	10.48	4.01
2014	Trans-National Bank	3.37	8.81	3.98
2014	Oriental Commercial Bank Ltd	3.48	8.39	3.95
2015	Kenya Commercial Bank Ltd	6.1	10.78	5.67
2015	Barclays Bank of Kenya Ltd	6.08	10.79	5.53
2015	Standard Chartered Bank Ltd	5.98	11.16	5.53
2015	Cooperative Bank of Kenya Ltd	4.73	10.73	5.37
2015	CFC Stanbic Bank Ltd	5.51	10.26	5.38
2015	Equity Bank Ltd	6.43	11.16	5.3
2015	Commercial Bank of Africa Ltd	4.11	9.84	5.28
2015	National Bank of Kenya Ltd	4.52	9.18	5.3
2015	Citibank N.A.	4.51	11.07	5.2
2015	Diamond Trust Bank Ltd	4.04	10.25	5.17
2015	NIC Bank Ltd	6.21	9.99	5.1
2015	I&M Bank Ltd	3	9.62	4.95
2015	Prime Bank Ltd	5.2	10.31	4.91
2015	Bank of Baroda Ltd	3.3	9.62	4.83
2015	Bank of Africa Ltd	3.6	9.62	4.81
2015	Bank of India	4.4	10.06	4.84
2015	Ecobank Ltd	3.85	10.22	4.72
2015	Family Bank Ltd	3	9.27	4.62
2015	Fina Bank Ltd	4.41	9.91	4.47
2015	African Banking Corporation Ltd	3.9	9.75	4.39
2015	Gulf African Bank Ltd	4.65	9.25	4.28
2015	Habib AG Zurich	3.3	9.69	4.34
2015	K-Rep Bank Ltd	3	9.97	4.3
2015	Consolidated Bank of Kenya Ltd	3	10.22	4.23
2015	Guardian Bank Ltd	3	9.58	4.16
2015	Fidelity Commercial Bank Ltd	3.9	9.52	4.16
2015	Victoria Commercial Bank Ltd	3.48	9.72	4.16
2015	Habib Bank Ltd	3.3	9.4	4.18
2015	Equatorial Commercial Bank Ltd	3.74	9.4	4.01
2015	First Community Bank Ltd	3.6	9.53	4.15
2015	Credit Bank Ltd	3.65	10.75	4.16
2015	Trans-National Bank	3.85	9.09	4.02
2015	Oriental Commercial Bank Ltd	3.78	8.67	4.01

2016	Kenya Commercial Bank Ltd	4.18	11.16	4.35
2016	Barclays Bank of Kenya Ltd	4.57	11.17	4.75
2016	Standard Chartered Bank Ltd	4.58	11.54	4.92
2016	Cooperative Bank of Kenya Ltd	4.29	11.11	4.68
2016	CFC Stanbic Bank Ltd	5.25	10.64	5.41
2016	Equity Bank Ltd	4.45	11.54	5.01
2016	Commercial Bank of Africa Ltd	5.02	10.22	5.32
2016	National Bank of Kenya Ltd	5.38	9.56	5.54
2016	Citibank N.A.	4.01	11.45	4.14
2016	Diamond Trust Bank Ltd	3.92	10.63	4.09
2016	NIC Bank Ltd	4	10.37	5.39
2016	I&M Bank Ltd	5.15	10	4.1
2016	Prime Bank Ltd	4.44	10.69	4.67
2016	Bank of Baroda Ltd	5.34	10	5.58
2016	Bank of Africa Ltd	4.73	10	4.84
2016	Bank of India	4.08	10.44	4.17
2016	Ecobank Ltd	4.13	10.6	4.47
2016	Family Bank Ltd	3.98	9.66	4.17
2016	Fina Bank Ltd	4.22	10.29	4.43
2016	African Banking Corporation Ltd	3.73	10.13	4.23
2016	Gulf African Bank Ltd	5.02	9.63	5.22
2016	Habib AG Zurich	4.02	10.07	5.7
2016	K-Rep Bank Ltd	5.57	10.35	3.72
2016	Consolidated Bank of Kenya Ltd	3.6	10.6	5.06
2016	Guardian Bank Ltd	4.84	9.96	5.21
2016	Fidelity Commercial Bank Ltd	5.05	9.9	3.97
2016	Victoria Commercial Bank Ltd	4.6	10.1	4.82
2016	Habib Bank Ltd	4.16	9.78	4.32
2016	Equatorial Commercial Bank Ltd	3.92	9.78	4.14
2016	First Community Bank Ltd	5.07	9.91	5.31
2016	Credit Bank Ltd	5.12	11.13	5.4
2016	Trans-National Bank	3.85	9.47	4.02
2016	Oriental Commercial Bank Ltd	4.18	9.05	4.35
2017	Kenya Commercial Bank Ltd	4.21	11.61	4.34
2017	Barclays Bank of Kenya Ltd	4.53	11.62	4.84
2017	Standard Chartered Bank Ltd	4.64	11.99	4.83
2017	Cooperative Bank of Kenya Ltd	4.32	11.56	4.62
2017	CFCStanbic Bank Ltd	5.25	11.09	5.38
2017	Equity Bank Ltd	4.58	11.98	4.95

2017	Commercial Bank of Africa Ltd	5.03	10.67	5.3
2017	National Bank of Kenya Ltd	3.86	10	5.53
2017	Citibank N.A.	3.99	11.9	4.15
2017	Diamond Trust Bank Ltd	4.01	11.08	4.01
2017	NIC Bank Ltd	4.03	10.82	5.28
2017	I&M Bank Ltd	5.2	10.45	4.37
2017	Prime Bank Ltd	4.33	11.14	4.72
2017	Bank of Baroda Ltd	5.35	10.45	5.53
2017	Bank of Africa Ltd	4.67	10.45	4.91
2017	Bank of India	4.04	10.89	4.16
2017	Ecobank Ltd	4.14	11.05	4.47
2017	Family Bank Ltd	4.01	10.1	4.16
2017	Fina Bank Ltd	4.3	10.73	4.39
2017	African Banking Corporation Ltd	3.75	10.57	4.16
2017	Gulf African Bank Ltd	5.1	10.08	5.17
2017	Habib AG Zurich	4	10.52	5.67
2017	K-Rep Bank Ltd	5.61	10.79	3.75
2017	Consolidated Bank of Kenya Ltd	3.51	11.05	5.1
2017	Guardian Bank Ltd	4.83	10.41	5.2
2017	Fidelity Commercial Bank Ltd	5.07	10.35	4.02
2017	Victoria Commercial Bank Ltd	4.6	10.55	4.81
2017	Habib Bank Ltd	4.09	10.22	4.28
2017	Equatorial Commercial Bank Ltd	3.84	10.23	4.64
2017	First Community Bank Ltd	5.13	10.36	5.3
2017	Credit Bank Ltd	5.14	11.58	5.37
2017	Trans-National Bank	3.87	9.92	4.02
2017	Oriental Commercial Bank Ltd	4.28	9.5	4.3