

**THE RELATIONSHIP BETWEEN MOBILE MONEY AND LOANS
ISSUED BY COMMERCIAL BANKS IN KENYA**

**BY
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DECLARATION

This research paper is my original work that has not been presented for a degree in any other University, for any other award and where other peoples 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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Finally, I also appreciate the University of Nairobi for offering a flexible programme that allows even the employed to fulfil their academic dreams.

DEDICATION

I dedicate this research project to my beloved parents Mr. & Mrs. Oromo. Their ever present support in my continuous quest for knowledge and self-improvement, has driven me this far.

ABSTRACT

Lending which may be on short, medium or long-term basis is one of the main services that commercial banks do render to their customers. According to Adedoyin and Sobodun (1991), lending is undoubtedly the heart of banking business. Therefore, its administration requires considerable skill and dexterity on the part of the bank management. Commercial banks in Kenya are fast embracing the mobile technology as a platform to operate on and increase not only their presence, but also their efficiency and general profitability. Mobile money has transformed the way people in the developing world transfer money and now it is poised to offer more sophisticated banking services which could make a real difference to commercial banks' lending performance. The study sought to determine the relationship between mobile money and loans issued to customers by commercial banks in Kenya.

This research adopted a descriptive research design. The population of this study was all the 43 commercial banks in Kenya as at September 2015 where a census survey was adopted. Secondary data on mobile money, especially the value of transactions, was collected from the Central Bank of Kenya's Bank Supervision reports as well as from the online repositories. Further, data on customer deposits and loans was collected from the Bank Supervision reports. The data on number of mobile banking users was obtained from the Communication Authority of Kenya's annual reports. All the data was collected on annual basis from 2007 to 2014 since mobile banking was introduced in Kenya in 2007.

The study revealed that the value of transactions had a positive but insignificant effect on loans and advances, $p > .05$. The results also showed a negative relationship between number of users and loans but the relationship was insignificant, $p > .05$. Further, the results showed that deposits had a positive effect on loans. The relationship was marginally significant at 5% level but significant at 10% level. Since both measures of mobile money were insignificant, the study concludes that mobile money does not influence the loans issued by commercial banks in Kenya. The study recommends that to improve on the loans and advances, banks should come up with more mobile based loan products for the customers. Secondly, the study recommends that loan products based on the mobile money platform should extend beyond the cash advanced to bank clients. In order to achieve more mobile money penetration, the study recommends that more banks should partner with the telecommunication firms by allowing them to operate mobile money loan services without the customers having to open accounts with the banks at their branches.

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LIST OF ABBREVIATIONS

GSMA – Group Speciale Mobile Association

ATM – Automated Teller Machines

CBK – Central Bank of Kenya

MM – Mobile Money

CBs–Commercial Banks

SIM – Subscriber Identity Module

MNOs – Mobile Network Operators

ES – Efficiency Structure

FSD – Financial Sector Deepening

GDP – Gross Domestic Product

IFC – International Finance Corporation

CBA – Commercial Bank of Africa

MMS –Mobile Money Services

HFG – Health Finance and Governance

USA – United States of America

CAK – Communications Authority of Kenya

CHAPTER ONE

INTRODUCTION

1.1 Background

The Kenyan financial sector has undergone tremendous changes in the last two decades. A lot of reforms have been undertaken in the sector that have led to proliferation of financial products, activities and organizational forms that have improved and increased the efficiency of the financial system. Advances in technology and changing economic conditions have boosted the need for this change (James and James, 2014). James, Odiek & Douglas, (2014) argue that stiff competition in Kenya's financial sector is forcing institutions into adopting new forms of technology to reduce the costs of doing business and widen customer outreach for enhanced profitability. Use of mobile money technology specifically in the banking industry has become usual in recent years as a way of maintaining customer loyalty and increasing market share. The new innovative systems (such as mobile banking) are especially targeting the earning but unbanked population in rural and hard to reach areas (James, Odiek & Douglas, 2014).

Citing the fact that the traditional bricks-and-mortar banking infrastructure is too expensive to serve the poor, particularly in rural areas; Innovations in technology, such as mobile payments, mobile banking, and digital identities makes it easier and less expensive for people to use financial services, while increasing financial security and poses an opportunity for banking institutions to reduce both their operational and administrative costs. Rachael, (2014) asserts that the desire for commercial banks to reduce their costs and improve their competitiveness has driven them to adopt mobile

money. Literature reveals that mobile money is faster, cheaper, more reliable, and safer (Jack & Suri 2011). Mobile money 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.

1.1.1 Mobile Money

Health finance and governance, (2013), define mobile money as financial transactions that are conducted using a mobile phone, where value is stored virtually (e-money) in an account associated with a SIM card. Such transactions are compatible with basic phones and do not require internet access. This study defines MM as the new technologies supporting money transfer services and financial transactions operated under financial regulation and performed via the mobile phone as opposed to the traditional over-the-counter transactions. Instead of transacting over the counter in CBs, customers are enabled to transact through their mobile phone devices. Mobile money allows those unable to access financial institutions or without a bank account to perform financial transactions as quickly and easily as sending a text message. Literature reveals that MM has not only led to increased number of individuals enrolling for banking services but also increased revenue for CBs as a result of transactions fees and interest income. In lieu of this, CBs in Kenya are currently incorporating the mobile infrastructure technology into their services and designing sophisticated banking services geared towards an increase in their market share and overall profitability.

Banking via mobile phones commonly referred to as mobile banking can offer a wide variety of services ranging from account information, which has to do with alerting the customers on the updates and transactions on their account through their mobile phones (James, Odiek & Douglas, 2014). People receive short messages on their phones informing them of the immediate transactions in their bank accounts. Through the mobile banking, one can make utility bill payments, withdrawals, transfers, airtime purchase, and bank statements request among other tasks, all in real time over mobile phones. Banks including Standard Chartered Bank (Uganda) (Buyer and lenders, 2001) have largely implemented service delivery technology as a way of augmenting the services traditionally provided by personnel, (Howcraft, Bacett, 1996). Partnerships between governments, financial companies, mobile network operations, mobile money providers, and donors are helping to expand mobile money solutions around the world, assisting countries to move from cash to electronic payments while ensuring financial inclusion for the poor (health finance and governance, 2013).

As of July 2013, the GSMA Mobile Money for the Unbanked Deployment Tracker listed 167 live mobile money services and 108 planned deployments in developing countries around the world. Mobile money services have been launched in over 70 countries, with over 41 new launches in 2012. The majority of the current mobile money deployments are located in Sub-Saharan Africa, and deployments in other regions, including Latin America and the Caribbean, are growing rapidly (health finance and governance, 2013). An important strategy is the collaboration by banks and mobile network operators

(MNOs) to deliver mobile phone-based money transfer services (Ehrbeck, 2012; Jenkins, 2008).

The Eastern African region, specifically Kenya is taking the lead. Even though West Africa is forging ahead for inclusion of its large unbanked population of up to 80 percent into the financial sector, the region is still very far behind the Eastern or South African region as well as the developed economies like the USA, Great Britain and Japan in mobile technology adoption and use. In the developed economies where smart phones have been adopted, mobile payment is evolving from credit and debit cards payments to the use of smart phones. Mobile transactions in the western world are predicted to reach \$1 trillion by 2015, but despite such predictions, mobile payments may not dominate the western markets immediately (Computerworld, 2012). Newman (2012) reports that as more people in the USA adopt smart phones like Apple iPhone or the Android phones and as online shopping continues to increase, technology and payment companies will make smart phones replace paper money or plastic (credit/debit cards) forms of payment. This study seeks to measure mobile money by looking at the number of mobile money users and the value of mobile money transactions.

1.1.2 Commercial Banks and Loans Issued

Lending practices in the world could be traced to the period of industrial revolution which increased the pace of commercial and production activities thereby bringing about the need for large capital outlays for projects. Many captains of industry at this period were unable to meet up with the sudden upturn in the financial requirements and

therefore turned to the banks for assistance (Felicia, 2011). Commercial Banks are institutions which accept deposits, make business loans and offers related services (Daniel, 2014). CBs offer several services to the public including, opening saving and current account, allowing deposits from customers, foreign exchange transactions and giving loans to the public. They in-turn charge a fee for allowing deposits and opening accounts and charge interest in the case of loans. Also, banks are of major importance for the financing of firms and households (John, Fredrick & Jagongo, 2014).

Lending which may be on short, medium or long-term basis is one of the main services that commercial banks do render to their customers. According to Adedoyin and Sobodun (1991), lending is undoubtedly the heart of banking business. Therefore, its administration requires considerable skill and dexterity on the part of the bank management. While a bank is irrevocably committed to pay interest on deposits it mobilized from different sources, the ability to articulate loanable avenues where deposit funds could be placed to generate reasonable income; maintain liquidity and ensure safety requires a high degree of pragmatic policy formulation and application (Felicia, 2011).

Commercial banks do grant loans and advances to individuals, business organizations as well as government in order to enable them embark on investment and development activities as a mean of aiding their growth in particular or contributing toward the economic development of a country in general (Felicia, 2011). Commercial banks are the most important savings, mobilization and financial resource allocation institutions. Consequently, these roles make them an important phenomenon in economic growth and

development. In performing this role, it must be realized that banks have the potential, scope and prospects for mobilizing financial resources and allocating them to productive investments. Therefore, no matter the sources of the generation of income or the economic policies of the country, commercial banks would be interested in giving out loans and advances to their numerous customers bearing in mind, the three principles guiding their operations which are, profitability, liquidity and solvency. However, commercial banks decisions to lend out loans are influenced by a lot of factors such as the prevailing interest rate, the volume of deposits, the level of their domestic and foreign investment, banks liquidity ratio, prestige and public recognition to mention a few (Felicia, 2011). This study seeks to measure amount of loans issued by CBs through looking at the amount of loans and advances issued to customers.

1.1.3 Mobile Money and Loans by Commercial Banks

Mobile technology has flourished throughout the developing world in the recent years faster than any other technology in history. The telephony mobile money transfer services are available to millions of previously underserved people, allowing them to safely send money and pay bills for the first time without having to rely exclusively on cash. Mobile money service introduced in 2007 with approximately 1.3m users and 1,582 agents moved transactions amounting to 3.8b on its debut year compared with 1.9T in 2013 and 2.3T in 2014. Mobile money accounts stood at 25.2M in 2014 having increased from 1.3M in its debut year. The rise in the cashless transaction is attributed to increasing partnerships between banks and mobile telephone service providers as well as rollout of various banking technologies that allows interaction with mobile telephone companies

and also accessible through internet (Central Bank of Kenya supervision reports of 2007-2014).

Mobile banking has become a competitive edge for Kenyan lenders, giving them easier and broader access to customers (Okoth, 2015). More than half of the banks in the country today have partnered with M-Pesa to perform a number of transactions since evidence reveals that mobile money is instrumental in increasing customer deposits which in return enables CBs to issue more loans and advances which translates into higher profits. In March KCB Group entered into a deal with Safaricom to enable subscribers of the telecom's mobile money platform access loans of between Sh50 and Sh1M repayable between one and six months. A month after launching its KCB M-Pesa account, Sh1 billion was lent out with 1.5M users depositing Sh100M (lender's 2015 first quarter financial report).

M-Pesa mobile money savings and credit arm, M-shwari was launched in 2012 in partnership with CBA Bank and expanded in February 2014 as a product that allows users to save and borrow money. Today, M-shwari has over 10 million customers, processes approximately 50,000 loans daily an uptake which has grown its savings and loans accounts to Sh153 billion and loan amounts to Sh29 billion respectively. The huge uptake of m-shwari in Kenya has seen the loan amount disbursed rise from 7billion in February 2014 to 29billion in March 2015. CBA has since grown its deposits making it the largest retail bank in Kenya by customer numbers, leading with 10M customers and followed closely by equity bank with 9.2M customers (Okuttah, 2015).

1.1.4 Commercial Banks in Kenya

The history of banking in Kenya dates back to 1896 when the National Bank of India opened a branch in Kenya (John, Fredrick & Jagongo, 2014). The Banking Sector is composed of the CBK, as the regulatory authority and the regulated; CBs, Non-Bank Financial Institutions and Forex Bureaus. CBs and mortgage finance companies are licensed and regulated under the Banking Act, Cap 488 and Prudential Regulations issued there under. Foreign Exchange Bureaus are licensed and regulated under the Central Bank of Kenya Act, Cap 491 and Foreign Exchange Bureaus Guidelines issued there under (CBK). Currently there are 43 licensed commercial banks and 1 mortgage finance company. Out of the 44 institutions, 31 are locally owned and 13 are foreign owned. The locally owned financial institutions comprise 3 banks with significant shareholding by the Government and State Corporations, 27 commercial banks and 1 mortgage finance institution.

According to Daniel (2014), the industry is mostly dominated by a few large banks which are foreign-owned, though some are partially locally owned. Six of these major banks have been listed on the Nairobi Stock Exchange. The commercial banks and non-banking financial institutions offer corporate and retail banking services but a smaller number, mainly comprising the larger banks, offer other services including investment banking. Over the last few years, the Banking sector in Kenya has continued to grow in assets, deposits, profitability and products offering. The growth has been mainly underpinned by an industry wide branch network expansion strategy both in Kenya and in the East

African community region and automation of a large number of services and a move towards emphasis on the complex customer needs rather than traditional off-the-shelf banking products (CBK, 2008).

1.2 Research Problem

Generally commercial banks in Kenya have tended, until the late 1980s, to adopt extremely conservative lending policies which they have justified as a prudent approach towards safeguarding deposits (Willan and Robert, 1992). Thus when considering whether to grant loans and advances, they not only required substantial collateral as security over and above the amount of the loan required, but also insisted on a host of other conditions, even when risk of failure seemed unlikely. This position changed considerably with aggressive competition, not only from non-bank financial institutions, but also from the entry of new banks with a more international outlook demanding a more liberal attitude to lending (Willan and Robert, 1992).

According to Higgins, Kendall & Lyon, (2012) needs for payment and transactional services are not always well served by conventional banks since they do not always find it easy or cost effective to adopt a full- feature package for banking services. The fast-changing competitive environment, globalization, economic changes, regulation, privatization and the like demands that commercial banks are run efficiently and effectively by continuously engaging in financial innovations (James &James, 2014). In Kenya emergence of new technologies, products, processes, markets and competitor banks places demand on any commercial bank to apply any skills necessary to remain competitive and achieve competitive advantage.

Mobile money offers millions of people a potential solution in emerging markets that have access to a cell phone, yet remain excluded from the financial mainstream (Rachael, 2014). It can make basic financial services more accessible by minimizing time and distance to the nearest retail bank branches (CGAP, 2006) as well as reducing the bank's own overheads and transaction-related costs. Mobile money presents an opportunity for commercial banks to extend banking services and in effect loan amounts issued to new customers thereby increasing their market (Lee, Lee and Kim, 2007). CBs in Kenya today are fast embracing the mobile technology as a platform to operate on and increase not only their presence, but also their efficiency and general profitability. Kassim, (2005) asserts that the technological revolution has produced new development in the banking industry. Mobile money has transformed the way people in the developing world transfer money and now it is poised to offer more sophisticated banking services which could make a real difference to commercial banks' lending performance. This success is attributed to the service being affordable and accessible to both high and low income earners (Mbogo, 2010).

Different scholars have done studies on financial innovation and electronic banking in Kenya. Kigen (2010) studied the impact of mobile banking on transaction costs of microfinance institutions where he found out that by then, mobile banking had reduced transaction costs considerably though they were not directly felt by the banks because of the then small mobile banking customer base. James, Odiek and Douglas (2014) studied the effects of mobile money services on the performance of banking institutions; a case of

kakamega town where they found out that Provision of mobile money services by various service providers had had a positive impact on the performance of the banking institutions. Although MMS had cut into the banking institutions market, such institutions had come up with counter strategies like agency banking, m-banking and internet banking among others in order to neutralize the negative impact of mobile money on their services. James & James (2014) in studying the effects of financial innovation on the financial performance of commercial banks in Kenya found out that the use of financial innovations which include the use of credit cards, mobile banking, internet banking and agent banking in Kenya had had great impacts on the financial performance of commercial banks in Kenya through increased number of transactions conducted by the banks in a day hence increased transaction charges, increased accuracy and efficiency, reliability and speed which gave them competitive advantage over the rest of the banks.

From the above discussions, it is evident that no research has focused on mobile money and the amount of loans issued by commercial banks; the main literature gap therefore exists in revealing how mobile money adoption has affected the amount of loans disbursed by commercial banks in Kenya. This study therefore sought to answer the research question; what is the relationship between mobile money and loans issued by commercial banks in Kenya?

1.3 Research Objective

This study sought to determine the relationship between mobile money and loans issued by commercial banks in Kenya.

1.4 Value of the Study

The findings of this study can be of benefit to different stakeholders in the field. To the management in commercial banks, this study informs them on the financial effect of mobile money innovation on their institutions lending. Through the findings of this study, the management can strategize on how to realize maximum benefits from mobile money innovation.

For the policy makers and agencies like the Central bank of Kenya (CBK), the findings of this study are important in informing the policy formulation especially with regard to regulating the mobile money services in Kenya. The research findings add dimension that may help improve policy direction with regard to regulation of mobile money innovation as well as factors that spur economic growth.

To the academicians and students of finance, this study helps to build the knowledge base in the discipline by adding on the existing literature on mobile money innovation and lending. The study can be used as a source of reference material besides suggesting areas where future research may be conducted.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Review of the work of other eminent writers on the subject matter of any research study helps to provide a conceptual framework of the study. Based on the review, actual practice is evaluated and recommendations are offered where variations occur between theory and actual practice. This chapter reviews various literatures in the fields of mobile money and the effect it has on amount of loans issued by commercial banks in Kenya. The key areas to be covered here are theoretical review, empirical review and the conceptual framework.

2.2 Theoretical Review

2.2.1 Schumpeterian Theory on Innovations

Schumpeter's (1934) theory of innovative profits emphasized the role of entrepreneurship (his term was entrepreneurial profits) to seek out of opportunities for novel value and generating activities which would expand (and transform) the circular flow of income through risk taking, pro activity by the enterprise leadership and innovation which aims at fostering identification of opportunities through intellectual capital of entrepreneur to maximize the potential profit and growth. Schumpeter argued that anyone seeking profits must innovate. That will cause the different employment of economic system's existing supplies of productive means. Schumpeter believed that innovation is considered as an

essential driver of competitiveness and economic dynamics. According to Schumpeter innovation is a "process of industrial mutation, which incessantly revolutionizes the economic structure from within, incessantly destroying the old one, incessantly creating a new one". This view is supported by the works of Frame and White (2002) who have emphasized on rent seeking motives of investors as a key driver in coming up with innovations.

2.2.2 Financial Intermediation Theory

Financial intermediation is a process which involves surplus units depositing funds with financial institutions who then lend to deficit units. Bisignano (1992) identified that 12 financial intermediaries can be distinguished by four criteria. First, their main categories of liabilities or deposits are specified for a fixed sum which is not related to the performance of a portfolio. Second, the deposits are typically short-term and of a much shorter term than their assets. Third, a high proportion of their liabilities are chequeable which can be withdrawn on demand and fourthly, their liabilities and assets are largely not transferable. The most important contribution of intermediaries is a steady flow of funds from surplus to deficit units. Diamond and Dybvig (1983) analyses the provision of liquidity that is transformation of illiquid assets into liquid liabilities by banks. In their model identical investors or depositors are risk averse and uncertain about the timing of their future consumption need without an intermediary all investors are locked into illiquid long term investments that yield high pay offs to those who consume later.

According to Scholtens and van Wensveen (2003), the role of the financial intermediary is essentially seen as that of creating specialized financial commodities. These are created whenever an intermediary finds that it can sell them for prices which are expected to cover all costs of their production, both direct costs and opportunity costs. Financial intermediaries exist due to market imperfections. As such, in a 'perfect' market situation, with no transaction or information costs, financial intermediaries would not exist. Numerous markets are characterized by informational differences between buyers and sellers. In financial markets, information asymmetries are particularly pronounced. Borrowers typically know their collateral, industriousness, and moral integrity better than do lenders. On the other hand, entrepreneurs possess inside information about their own 13 projects for which they seek financing (Leland and Pyle, 1977). Moral hazard hampers

2.2.3 Market Power and Efficiency Structure Theories

The MP theory states that increased external market forces results into market power which is defined as the capacity of an organization to increase its prices without losing all its clients. In banks, as in other business organizations, Market Power can take two forms: differentiation of products and services, or ease of search. There is a trade-off between differentiation and loss of legitimacy which is optimized at a strategic balance point (Shepherd, 1986). Likewise, there is a trade-off between ease of search and security that must be taken into account. This theory categorizes Information Communication and Technology (ICT) investments into Market-Power driven initiatives profit. Moreover, the hypothesis suggest that only firms with large market share and well differentiated portfolio can win their competitors and earn monopolistic profit.

Efficiency structure theory (ES) suggests that enhanced managerial and scale efficiency leads to higher concentration and then to higher profitability. According to Olweny and Shiphoh (2011) balanced portfolio theory also added additional dimension into the study of bank performance. It states that the portfolio composition of the bank, its profit and the return to the shareholders is the result of the decisions made by the management and the overall policy decisions.

From the above theories, it is possible to conclude that bank performance is influenced by both internal and external factors. The internal factors include bank size, capital, management efficiency and risk management capacity. The same scholars contend that the major external factors that influence bank performance are macroeconomic variables such as interest rate, inflation, economic growth and other factors like ownership.

2.3 Determinants of Commercial Banks' Lending in Kenya

Most studies divide the determination of commercial banks' lending into two categories, internal and external factors (Olusanya , Oyebo & Ohadebere, 2012). The internal determinants include profitability which is within the control of the bank management and can be broadly classified into financial statement variables and non-financial statement. Financial statement variables refer to those items in the balance sheet and income statement while non-financial statement variables have no direct relationship to the financial statement (Haron sudin, 2004). External factors are those factors that are not to be controlled by the bank management e.g. Competition, regulation, market share, ownership, money supply and inflation.

2.3.1 Policies and Regulations

Oloyede (1999) claimed that it is generally acknowledged that commercial banking by its nature is highly prone to volatility and fragility – whether arising from exogenous shocks or endogenous policy measures – and therefore, amenable to regulations and supervision. The forms of regulation vary, but in general, they embrace statutory regulations or rules of behaviour that may be administratively imposed or that can be guided through a market-oriented approach. One of such guidelines is Section 20 of Bank and Other Financial Institution Act (BOFIA) as amended which restricted the terms and amount of loans that can be given to banks insider. For instance, a bank is not allowed to grant unsecured credit facilities in excess of one year to any of his officers and employees. Similarly, Chizea (1994) asserted that there are certain aspects of fiscal and monetary policies which could affect the decision of the discerning and informed public to patronize the bank and the lending behaviour of commercial banks.

Paramount amongst these measures is what could be called the interest rate disincentive. Interest rates have been so low in the country that they are negative in real terms. As inflation increased, the purchasing power of money lodged in deposit accounts reduces to the extent that savers per force pay an inflation tax (Felicia, 2011). There is also the fear that the hike in interest rates would increase inflation rates and make a negative impact on the rate of investment. Usman (1999) also supported this position by stating that a major regulation affecting commercial banks lending in Nigeria is the restriction on the amount of interest they are allowed to pay on deposits in an effort to attract additional

depositors and the interest they charge on their fund based activities. Goldfeld and Chandler (1980) claimed that, commercial banks must pay more attention to liquidity than many other types of financial institutions such as life insurance companies. This results from the high turnover of their debt liabilities. A large part of the gross out payments by a bank is met from current gross receipt of funds in the normal course of business.

2.3.2 Liquidity

Ituwe (1983) explains that, a bank's ability to grant further advances is checked by the available cash in its vault. Customers' drawings are paid in two ways, either in cash or through bank accounts. Since cheques have to be met in cash in many cases, commercial banks, therefore, have to stock reasonable quantity of cash to meet customers' demands. Where a bank grants advances in excess of its cashing ability, the bank soon runs into difficulty in meeting its customers' cash drawings.

Chodechai (2004) further links banks' lending decisions to the past relationship with their borrowers. Past relationship according to him can help banks to obtain more private information, leading to a more accurate understanding of the borrower's business and financial situation. Carletti et al (2006) however, discussing on multiple-lending is of the opinion that banks choose to share lending whenever the benefit of greater diversification, in terms of higher cost per project monitoring dominates the cost of free-riding and duplication of efforts.

2.3.3 Technology Innovations and Economic Growth

Empirical evidence that investigates a direct effect of payment systems on economic growth is sparse. Berger (2003) found information technology (IT) innovations to have a positive impact on overall economic growth through positive effects on banking systems and bank efficiencies. Waverman et al (2005) find investments in mobile telecommunication infrastructure to have a positive and significant impact on economic growth. Specifically, they find that a unit increase in mobile phone penetration increased economic growth of a country by 0.039 percent. They further conjecture this impact may be twice as large in developing countries as compared to developed countries due to the absence of landline infrastructure. Given payment technology and telecommunication infrastructure investments independently have shown positive effects on economic growth, it is expected that coupled together there would be an even greater positive effect for an economy.

2.4 Empirical Review

Although mobile money literature is still limited, initial empirical evidence indicates that using a mobile money account brings positive returns to individuals. A market-level analysis conducted by Mbiti and Weil (2011) found the introduction of M-PESA in Kenya led to a significant decrease in the prices of money transfer competitors. Additionally, they found an increase in the frequency of receiving remittances, which the authors conclude over-time has contributed toward financial inclusion in the country (Mbiti and Weil, 2011, Jack and Suri, 2011).

In Mozambique, Batista and Vicente (2013) find evidence that the marginal willingness to remit was increased by the availability of mobile money. They also observed substitution effects of mobile money for traditional alternatives for both savings and remittances. In Niger, Aker et al (2011) look at the effects of using mobile money accounts for delivery of cash transfers versus traditional methods. Specifically, they find mobile money reduced the overall transaction costs of recipients, while offering an increase in freedom, flexibility, and privacy. A qualitative pilot study conducted in rural Cambodia by Vong et al (2012) identify benefits of time, security and convenience for micro-entrepreneurs who use mobile money services in rural areas.

Several studies have also been conducted on the effects of mobile money on the performance of commercial banks. James, Odiek and Douglas (2014) studied the effects of mobile money services on the performance of banking institutions; a case of Kakamega town where they found out that Provision of mobile money services by various service providers had had a positive impact on the performance of the banking institutions. They attribute this positive contribution of the technology to its ability to increase customer access to the banking institutions financial services, convenience, security, reliability and confidentiality, including its ability to cope with the ever changing customer expectations. Although MMS had cut into the banking institutions market, James, Odiek and Douglas (2014) explain that such institutions had come up with counter strategies like agency banking, m-banking and internet banking among others in order to neutralize the negative impact of mobile money on their services.

James & James (2014) in studying the effects of financial innovation on the financial performance of commercial banks in Kenya found out that the use of financial innovations which include the use of credit cards, mobile banking, internet banking and agent banking in Kenya had had great impacts on the financial performance of commercial banks in Kenya through increased number of transactions conducted by the banks in a day hence increased transaction charges, increased accuracy and efficiency, reliability and speed which gave them competitive advantage over the rest of the banks.

Tiwari, Buse and Herstatt (2006) studied mobile banking as business strategy: impact of mobile technologies on customer behaviour and its implications for banks. The study sought to examine the opportunities for banks to generate revenues by offering value added; innovative mobile financial services while retaining and even extending their base of technology-savvy customers. According to Koivu (2002) uptake of mobile phone in Kenya has been unprecedented. Mobile banking in Kenya affects performance of organization, behavior and decision making of the entire economy. The trend of continued reliance on mobile devices to execute monetary transaction is steadily gaining momentum. Mobile banking is one innovation which has progressively rendered itself in pervasive ways of cutting across numerous sectors of economy and industry. Kigen (2010) studied the impact of mobile banking on transaction costs of microfinance institutions where he found out that by then, mobile banking had reduced transaction costs considerably though they were not directly felt by the banks because of the then small mobile banking customer base. Kigen (2010) sought to determine the impact that mobile banking bore on transactional costs of microfinance institutions. Kingoo (2011)

studied the relationship between electronic banking and financial performance of commercial banks in Kenya where he paid keen attention on the microfinance Institutions in Nairobi.

2.5 Summary of Literature Review

This chapter started by looking at the theoretical framework where it discussed the theories on which the study is found: Schumpeterian theory on innovations, financial intermediation theory and market power and efficiency structure theory. From the discussion of the theoretical and empirical literature, there exists a research gap on the effect of mobile money on the amount of loans issued by commercial banks in Kenya. This paper sought to fill the gap by undertaking an extensive analysis of a sample of 43 commercial banks in Kenya. It sought to assess the effect of mobile money innovation on commercial banks' lending in Kenya.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter sets out various stages and phases that were followed in completing the study. In this stage, most decisions about how research was executed and how data was gathered, towards the completion of the research are looked at. Precisely, the section covers; research design, target population, data collection and data analysis.

3.2 Research Design

This research adopted descriptive research design since the study sought to build a profile about the relationship between mobile money and loans issued by commercial banks in Kenya which will be generalized to a larger population. Mugenda and Mugenda (2003) describes descriptive research design as a systematic, empirical inquiring into which the researcher does not have a direct control of independent variable as their manifestation has already occurred or because the inherent cannot be manipulated. Descriptive studies are concerned with the what, where and how of a phenomenon hence more placed to build a profile on that phenomenon (Mugenda and Mugenda, 2003).

3.3 Population

Polit and Hungler (1999) refer to the population as an aggregate or totality of all the objects, subjects or members that conform to a set of specifications or an entire group of persons or elements that have at least one thing in common. A population is a group of individuals, objects or items from which samples are taken for measurement. The target

population was all commercial banks providing formal and regulated financial services in Kenya. This included the 43 commercial banks operating in Kenya by September 2015.

3.4 Data Collection

The study used secondary data from Central Bank of Kenya (CBK) supervisory reports and the annual reports of the Communications Authority of Kenya (CAK). The data was collected using data collection sheet which was edited, coded and cleaned. Data was mainly obtained covering the period between 2007 and 2014. Aggregate annual data was used in the study as it was the only available data both from the Central Bank of Kenya (CBK) supervisory reports and the annual reports from the Communications Authority of Kenya (CAK). Bank specific data was not available as banks do not publish this data publicly. All efforts made to get this data from specific banks was fruitless as such data on mobile money is kept by the CAK, prompting the use of CAK's data on the number of mobile money users while the data on the value of transactions was gathered from the CBK's annual reports.

3.5 Data Analysis

Statistical Package for Social Sciences (SPSS) Version 22.0 was used to aid in data analysis. Both descriptive and regression analyses were used in this study as a test of significance. The data was analyzed at significance level of 0.05. In order to determine the relationship between mobile money and loans issued by commercial banks in Kenya, the researcher conducted a multiple regression analysis using the regression model below.

3.5.1 The Analytical Model

This model was based on Kigen (2010) who analyzed the impact of mobile banking on transaction costs of microfinance institutions by looking at mobile banking adoption and the behavior of transaction costs. The model is supported by Kingoo (2011) in studying the relationship between electronic banking and financial performance of commercial banks in Kenya by looking at the wider electronic banking and further supported by Rachael (2014) in studying effects of mobile banking on the performance of commercial banks in Kenya. The independent variables to be measured in this research were the volume of mobile money transactions, number of mobile money users and customer deposits. The regression equation was:

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

Where Y is loans and advances to customers, X1 is the value (amount) of mobile money transactions, X2 is the number of mobile money users, and X3 is the customer deposits. Further, ε is the error term, β_0 is the constant (The predicted value of Y when all of the X values equal to Zero) and β_1 to β_3 are the coefficients of X1 to X3.

3.5.2 Tests of Significance

To test for the strength of the model and the relationship between mobile money and loans issued by commercial banks in Kenya, the researcher conducted an Analysis of Variance (ANOVA). The study tested the significance at the 5% level.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the results of the study. The chapter is structured as follows: the next section presents the findings of the study, specifically, the descriptive analysis results and the regression analysis result.

4.2 Descriptive Analysis

Table 4.1 shows the descriptive results of all the variables used in the study in terms of minimum values, maximum values, mean scores and standard deviations. The results show that the mean value of mobile money transactions was Sh. 1.047 billion and the mean number of users was 15.3 million. The customer deposits averaged Sh. 1.292 trillion while the loans and advances averaged Sh. 1.073 trillion.

Table 4.1: Descriptive statistics

	Minimum	Maximum	Mean	SD
Value of transactions	16,318,838	2,371,794,000	1,046,978,969	846,305,525
Number of users	1,345,270	25,326,300	15,322,890	9,176,493
Customer deposits (M)	100,602	2,292,198	1,291,847.4	71,422.1
Loans and advances (M)	495,417	1,881,024	1,073,302.7	479,743.6

4.3 Regression Analysis

Table 4.2 shows the summary regression model results. The results show that the R² was 0.936 suggesting that the model explained 93% of the variance in bank loans and advances. The adjusted R² shows that the model explains 88.8% of the variance in bank

loans and advances. The Durbin-Watson figure of 2.4 shows that autocorrelation between the independent variables was low as it is closer to 2.0.

Table 4.2: Summary model

R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
.968 ^a	.936	.888	.15447	2.450

a. Predictors: (Constant), ln_deposits, ln_val, ln_users

b. Dependent Variable: ln_loans

4.4 Correlation Analysis

The correlation analysis results are shown in Table 4.3. This analysis was carried out to test for any multicollinearity in the data. The results show that there was high correlation among the independent variables. For instance, value of transactions was highly correlated with both number of users ($r = .953$) and customer deposits ($r = .894$) while number of users was also highly correlated with customer deposits ($r = .864$). Researchers suggests that when multicollinearity is observed, the researcher should decide whether to delete the offending variables or retain them based on the theory. In this study, the variables are retained as the theory has shown that all these three variables can be used in a single model to predict a certain outcome.

Table 4.3: Correlation matrix

		Value of transactions	Number of users	Customer deposits	Loans and advances
Value of transactions	Pearson Correlation	1	.953**	.894**	.996**
	Sig. (2-tailed)		.000	.003	.000
	N	8	8	8	8
Number of users	Pearson Correlation	.953**	1	.864**	.936**
	Sig. (2-tailed)	.000		.006	.001
	N	8	8	8	8
Customer deposits	Pearson Correlation	.894**	.864**	1	.904**
	Sig. (2-tailed)	.003	.006		.002
	N	8	8	8	8
Loans and advances	Pearson Correlation	.996**	.936**	.904**	1
	Sig. (2-tailed)	.000	.001	.002	
	N	8	8	8	8

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

Table 4.4 shows the results for the analysis of variance (ANOVA). The results show that the F-statistic of 19.546 was significant at 1% level of significance. This shows that the regression model was fit to explain the relationship between mobile money and amount of loans.

Table 4.4: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	1.399	3	.466	19.546	.007 ^b
Residual	.095	4	.024		
Total	1.495	7			

a. *Dependent Variable: ln_loans*

b. *Predictors: (Constant), ln_deposits, ln_val, ln_users*

Table 4.5 presents the coefficient results from the regression analysis. The results show how the variables affected loans and advances and whether the relationship was significant or not. The study found that the value of transactions had a positive but insignificant effect on loans and advances, $p > .05$. The results also show a negative relationship between number of users and loans but the relationship was insignificant, $p > .05$. Further, the results show that deposits had a positive effect on loans. The relationship was marginally significant at 5% level but significant at 10% level.

Table 4.5: Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	21.510	2.250		9.561	.001
Ln(value)	.756	.377	2.709	2.007	.115
Ln(users)	-.897	.625	-1.986	-1.436	.224
Ln(deposits)	.198	.074	.429	2.676	.055

4.5 Interpretation of Findings and Discussions

The study sought to determine the relationship between mobile money and loans issued to customers by commercial banks in Kenya. In order to ascertain this, a descriptive analysis, correlation analysis and regression analysis were conducted. The descriptive analysis showed that the mean value of mobile money transactions was Sh. 1.047 billion and the mean number of users was 15.3 million. Further, the results showed that the customer deposits averaged Sh. 1.292 trillion while the loans and advances averaged Sh. 1.073 trillion.

The correlation analysis was conducted to check whether the independent variables were serially correlated. The results showed that the value of transactions was highly correlated with both number of users ($r = .953$) and customer deposits ($r = .894$) while number of users was also highly correlated with customer deposits ($r = .864$). All these variables were retained in the final model as the theory has shown that all these three variables can be used in a single model to predict a certain outcome.

The regression analysis was conducted to test the effect of the value of mobile money transactions on loan advances. The results showed that the value of mobile money transactions had a positive effect on bank loans. However, at 5% level of significance, this relationship was insignificant. Thus, the value of mobile money does not influence the amounts of loans issued by commercial banks in Kenya. This can be attributed to the fact that most banks currently do not offer loans through mobile money platforms and, therefore, the effect of the value of transactions on loans is insignificant. In future, when most of the banks will be able to offer their clients loans through the mobile banking platforms, an effect may be observed.

The regression analysis also examined the effect of number of mobile money users on bank loans and advances. The study also revealed that the number of bank mobile money users in Kenya had a negative effect on loans and advances. This relationship was, however, insignificant at 5% level of confidence. This shows that the number of mobile money users does not affect the amounts of loans and advances given by commercial

banks in Kenya. This is also attributed to the low number of mobile money banking customers within the banking industry as well as the low number of bank loans offered to them through mobile banking platforms. Most of these users make other transactions other than receive bank loans and, therefore, the impact of their numbers on loans and advances offered by commercial banks in Kenya is still insignificant.

The study also examined the effect of customer deposits on bank loans through a regression analysis. The results showed that customer deposits had a positive and marginally significant effect on the loans and advances. The results were marginally significant at 5% level of confidence. Thus, customer deposits influence the loans and deposits given by commercial banks in Kenya. This is expected as most loans and advances are given from the customer deposits in various bank accounts. Thus, the banks with higher customer deposits are likely to give more loans to the clients than those with lower customer deposit base.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter first presents the summary of research findings. This is followed by the conclusion of the study, the recommendations for policy and practice and the suggestions for further research.

5.2 Summary of Findings

The study sought to determine the relationship between mobile money and loans issued by commercial banks in Kenya. Secondary data on mobile money, especially the value of transactions, was collected from the Central Bank of Kenya's Bank Supervision reports as well as from the online repositories. Further, data on customer deposits and loans were also collected from the Bank Supervision reports.

The data on number of mobile banking users was not available from the Central Bank of Kenya and neither was it available from the Kenya National Bureau of Statistics. Thus, these figures were obtained from the Communication Authority of Kenya's annual reports. All the data were collected on annual basis from 2007 to 2014 since mobile banking was introduced in Kenya in 2007. Thus, a total of eight-year data was collected.

The descriptive results showed that the mean value of mobile money transactions was Sh. 1.047 billion and the mean number of users was 15.3 million. The customer deposits averaged Sh. 1.292 trillion while the loans and advances averaged Sh. 1.073 trillion.

Thus, since 2007, the mobile banking parameters have been steadily growing as more banks register new users to their mobile banking platforms and more customers conduct mobile banking transactions.

The correlation analysis showed that the value of transactions was highly correlated with both number of users ($r = .953$) and customer deposits ($r = .894$) while number of users was also highly correlated with customer deposits ($r = .864$). Since the need to retain or drop variables is at the discretion of the researcher based on a specific theoretical framework, all these variable were retained in the final model as the theory had shown that all these three variables can be used in a single model to predict a certain outcome.

The regression results showed that the model explained 93% of the variance in bank loans and advances. The ANOVA results showed that the model was fit at 1% level of significance. This suggested that at least one of the predictors in the model was significant in predicting the outcome – in this case the bank loans.

The study revealed that the value of transactions had a positive but insignificant effect on loans and advances, $p > .05$. The results also showed a negative relationship between number of users and loans but the relationship was insignificant, $p > .05$. Further, the results showed that deposits had a positive effect on loans. The relationship was marginally significant at 5% level but significant at 10% level.

5.3 Conclusion

The purpose of this study was to determine the relationship between mobile money and loans issued by commercial banks in Kenya. The results showed that the value of transactions had a positive but insignificant effect on loans and advances. It is, therefore, concluded that the value of mobile money transactions is not related to the loans offered by commercial banks in Kenya.

This is inconsistent with the findings of James, Odiek and Douglas (2014) who found a significant impact of mobile money banking on bank performance. This is because the current transactions are not related to loans but other different kind of transactions as most banks have not embraced loan provision through mobile money. Currently, it is Equity Bank, Commercial Bank of Africa and Kenya Commercial Bank that are providing loan services through mobile money platforms. Thus, the current loan levels provided by the banks cannot have a significant impact on the overall loan portfolio.

The second measure of mobile money that was tested was the number of mobile money users. The study also found a negative relationship between number of mobile money users and loans but the relationship was insignificant. This leads to the conclusion that the number of mobile money users does not influence the loans and advances by commercial banks in Kenya.

This is inconsistent with James & James (2014) who found that mobile banking had great impacts on the financial performance of commercial banks in Kenya. As had been

explained above, the number of customers on mobile money banking platforms is still low in Kenya as most banks have not embraced the technology. Thus, the smaller number of clients has not yet influenced the bank loans in Kenya.

The study also tested how customer deposits affect bank loans and advances as a control for the model. The results showed that customer deposits had a positive and marginally significant effect on bank loans and advances. This means that as the customer deposits rise, the loans and advances offered by commercial banks also rise. The study, therefore, concludes that customer deposits influence bank loans and advances.

This is consistent with the findings of Kigen (2010) who noted that customer deposits were key in enhancing loan portfolios. This can be explained by the fact that most banks use the customer bank deposits to lend to the customers. Thus, banks with higher customer deposits are highly likely to lend more to their clients.

5.4 Recommendations

The study recommends that to improve on the loans and advances, banks should come up with more mobile based loan products for the customers. Some of the banks such as Commercial Bank of Africa, Equity Bank and the Kenya Commercial Bank have already established mobile-based loan products. However, the mobile loans and advances take up a very small proportion of mobile money transactions in banks. Thus, to improve on the effect of mobile money on bank loans and advances, more loan products based on the mobile money should be introduced by banks.

Secondly, the study recommends that loan products based on the mobile money platform should extend beyond the cash advanced to bank clients. Thus, banks should introduce product and service loans that are based on the mobile money. For instance, at the moment Safaricom offers its clients electricity tokens on loan. Such innovations can be borrowed by the banks in order to enhance the mobile money value and, therefore, improve on the loans and advances provided by the banks through their mobile platforms.

In order to achieve more mobile money penetration, more banks should partner with the telecommunication firms by allowing them to operate mobile money loan services without the customers having to open accounts with the banks at their branches. This is already being done between Safaricom and Commercial Bank of Africa where an MShwari customer does not need to open an account with the bank but borrows directly from his phone. This contrasts the model taken up by Kenya Commercial Bank which has partnered with Safaricom to vendor loan services but the mobile user must have an account with the bank in order to benefit from the loan services.

5.5 Limitations

First, this study is based solely on Kenya. A focus on Kenya limits the applicability of results to the entire East African region, the Sub-Saharan Africa or Africa in general. Thus, any attempts to apply the results of this study in other jurisdictions other than Kenya must be approached with utmost care.

Secondly, the study used time series secondary data. Thus, the accuracy of the results in this study are based on the accuracy of the data sources gathered from CBK and CA (formerly CCK). The assumption made in this study is that the data captured by the two institutions is accurate.

Thirdly, neither the commercial banks nor the Central Bank of Kenya publish data on the value of bank-specific value of mobile money transactions or the number of mobile money users. This was the major challenge in this study and, therefore, masked data from the CBK and the CA were used to proxy for these variables.

Fourth, this study uses an OLS regression as bank specific data was lacking to perform a panel data regression. As such, the study suffers from the limitations of OLS regression models as it masks the effects of predictors on the outcome variable.

Lastly, yearly data is used in this study as it was not possible to gather quarterly data for all the variables under study. This limits the number of observations for regression analysis and, therefore, affects the regression model outcome in terms of its accuracy.

5.6 Suggestions for Further Research

More studies need to be conducted in this area. Specifically, it clear that most of the mobile money transactions are being conducted by bank agents. Thus, it will be important to examine how the agents have influenced mobile money adoption in Kenya or whether it is the mobile money that has influenced the rise of bank agents in Kenya.

An examination of this relationship is, therefore, of paramount importance to scholars of financial deepening in developing countries.

The study also recommends that, subject to availability of bank-specific data, a study be conducted on the impact of mobile money banking on the key performance indicators of commercial banks in Kenya. This will help address the challenge of number of limited variables in the model.

There is also need to conduct cross-country study on this issue in order to provide results that can be applicable across several African countries. This will help address the limitation of one-country focus as was in this study. A focus on the Sub-Saharan region would be most relevant for countries like Kenya.

The study also suggests that future studies gather data directly from the commercial banks. This way, bank-specific data on mobile bank can be used to examine the relationship between mobile money and loans issued at a bank specific level. This may also aid in panel data regression analysis.

Lastly, the study suggests that future research use quarterly data if it can be available in order to expand the number of observations and, therefore, the model accuracy and predictive ability.

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Appendices

List of Commercial Banks (Source: CBK)

- 1) African Banking Corporation Ltd
- 2) Bank of Africa Kenya Ltd
- 3) Bank of Baroda Ltd
- 4) Bank of India Ltd
- 5) Barclays Bank of Kenya Ltd
- 6) CFC Stanbic Bank Ltd
- 7) Charterhouse Bank Ltd
- 8) Chase Bank Kenya Ltd
- 9) Citibank N.A Ltd
- 10) Commercial Bank of Africa Kenya Ltd
- 11) Co-operative Bank of Kenya Ltd
- 12) Credit Bank Ltd
- 13) Development Bank of Kenya Ltd
- 14) Diamond Trust Bank Kenya Ltd
- 15) Dubai Bank Kenya Ltd
- 16) Ecobank Kenya Ltd
- 17) Equatorial Commercial Bank Ltd
- 18) Equity Bank Ltd
- 19) Family Bank Limited
- 20) Fidelity Commercial Bank Ltd
- 21) Fina Bank Ltd
- 22) First community Bank Limited
- 23) Giro Commercial Bank Ltd
- 24) Guardian Bank Ltd
- 25) Gulf African Bank Limited
- 26) Habib Bank A.G Zurich
- 27) Habib Bank Ltd
- 28) Imperial Bank Ltd
- 29) I &M Bank Ltd
- 30) Jamii Bora Bank Limited
- 31) Kenya Commercial Bank Ltd
- 32) K-Rep Bank Ltd
- 33) Middle East Bank (K) Ltd

- 34) National Bank of Kenya Ltd
- 35) NIC Bank Ltd
- 36) Oriental Commercial Bank Ltd
- 37) Paramount Universal Bank Ltd
- 38) Prime Bank Ltd
- 39) Standard Chartered Bank Kenya Ltd
- 40) Trans-National Bank Ltd
- 41) UBA Kenya Bank Limited
- 42) Victoria Commercial Bank Ltd
- 43) Housing Finance Ltd

Value of Transactions, Customer Deposits & Loans and Advances

Year	Value of transaction	Customer Deposits	Loans and Advances
2014	2,371,794,000	2,292,198,000,000	1,881,024,000,000
2013	1,901,559,000	1,935,661,000,000	1,532,387,000,000
2012	1,544,807,000	1,707,834,000,000	1,296,452,000,000
2011	1,169,150,200	1,488,168,000,000	1,152,011,000,000
2010	732,219,900	1,236,549,000,000	876,357,000,000
2009	473,411,500	100,602,000,000	721,615,000,000
2008	166,571,320	864,010,000,000	631,159,000,000
2007	16,318,838	709,757,000,000	495,417,000,000

Source: Central Bank of Kenya

Mobile Money Users

Year	Number of users
2014	25,249,200
2013	25,326,300
2012	21,060,000
2011	19,191,000
2010	16,446,300
2009	8,882,580
2008	5,082,470
2007	1,345,270

Source: Communications Authority of Kenya