EFFECT OF MOBILE MONEY ON NON-PERFORMING LOANS OF COMMERCIAL BANKS IN KENYA

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DECLARATION

I declare that this is my original work and has not been presented in any other University or College for Examination or Academic purposes.

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This project has been forwarded for presentation with my approval as university supervisor.

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DEDICATION

I dedicate this study to my dear family members, My Dad and Mum, Aloise & Anne Ndegwa, brothers and sisters, Peter, Steve, Joseph, Catherine and Ernesther for all the support they gave me all the time as I prepared and worked on this project.

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LIST OF ABBREVIATIONS

CAR	Capital Adequacy Ratio
CBK	Central Bank of Kenya
CRM	Credit Risk Management
DTM	Deposit Taking Microfinance
GCC	Gulf Cooperation Council
GDP	Gross Domestic Product
IMF	International Monetary Fund
MFI	Microfinance Institution
MMT	Mobile Money Transfer
NPLs	Non-Performing Loans
NSE	Nairobi Securities Exchange
SME	Small and Medium Enterprises
SMS	Short Message Service
SSA	Sub-Saharan Africa

ABSTRACT

Mobile money, also referred to as mobile payment, mobile money transfer and mobile wallet, generally refers to services operated and performed from a mobile device such as mobile phone, credit or debit cards; the intersection of both banking and telecommunications services. It involves a diverse set of stakeholders from both mobile phone operators and financial service institutions. Mobile money services have been defined as electronic money accounts that can be accessed via mobile phone. Mobile money services offers secure and convenient means for banked and unbanked people to send and receive money with mobile phones at home and abroad; anywhere at any time. It contains features such as mobile wallet, mobile transfer, airtime transfers and mobile banking. The study aimed at establishing the effect mobile money has on non-performing loans amongst commercial banks

The study used a descriptive research design. Descriptive research design describes the characteristics of the variables interest in a situation. The goal of a descriptive study was to offer the researcher a profile or descriptive relevant aspects of the phenomenon of interest from an individual organizational industry oriented or other perspective. It aimed at explaining how one variable produces changes in the other. This study sought to explain the significance of interest rate, growth in GDP, inflation, exchange rate or unemployment in the economy on the level of Non-Performing Loans hence it is a cause-effect investigation. The study sole used secondary data collected from the 43 commercial banks in Kenya. Multiple regression analysis was used in establishing the significance of the relationship so sought.

The findings established that GPD growth has a negative relationship with non-performing loans and has statistical significance at 5% level of significance in causing the changes in non-performing loans in commercial banks in Kenya. A unit increase in GDP growth will lead to 0.02176 units decrease in non-performing loans. The study contends that growth in the gross domestic product usually increases the income which ultimately enhances the loan payment capacity of the borrower which in turn contributes to lower bad loan and vice versa. The study also established positive association between unemployment rate and non-performing loans. There is statistical significance between unemployment rate and non-performing loans at 5% level of significance. A unit increase in unemployment rate will lead to 0.39969 units increase in non-performing loans. The result conforms to the theory that an increase in the unemployment in the country negatively affects the incomes of the individuals which increases their debt burden similarly an increased unemployment in the economy also negatively affects the demand of the products of firms which ultimately affects the production/sales of the firms, this ultimately leads to decline in revenues of the firms and a fragile debt conditions. As such banks should invest more on technology.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Mobile money, also referred to as mobile payment, mobile money transfer and mobile wallet, generally refers to services operated and performed from a mobile device such as mobile phone, credit or debit cards; the intersection of both banking and telecommunications services (World Bank, 2010). It involves a diverse set of stakeholders from both mobile phone operators and financial service institutions. Mobile money services have been defined as electronic money accounts that can be accessed via mobile phone (Zutt, 2010). Mobile money services offers secure and convenient means for banked and unbanked people to send and receive money with mobile phones at home and abroad; anywhere at any time. It contains features such as mobile wallet, mobile transfer, airtime transfers and mobile banking. Mobile wallet enables the subscriber to receive, store, send or pay money anywhere any time. Money transfer options means that one can send money from their mobile money account to a different subscriber anywhere anytime, which is similar to airtime transfer, where one can purchase and send airtime to another subscriber within the same network. Mobile banking works closely with banks to provide banking services to subscribers of mobile money.

1.1.1 Mobile Money

The mobile money service is an aspect of a broader concept emerging in the electronic payment and banking industry. The main idea behind the emergence of using technology

to facilitate money transactions via mobile phones was to create financial awareness to the poorer populations in developing countries, who either had no access to formal banks or could not afford to have a bank account due to expensive rates levied by the banks (Mwangi and Njuguna, 2009). Traditionally, commercials banks had always provided individuals with payment options and services. Customers have always been able to use different bank branches to make their payments through bank tellers, use ATMs, online banking, mobile and video banking. However, with time, evolutionary changes have taken place where introduction of other forms of payments have emerged; starting with the use of electron cards to mobile money. These payments are intended to cover emergencies like unexpected payments that need to be done fast and convenient and efficient money transfer (Otieno, 2013). The scope of offered service may include facilities to conduct banking transaction, to administer accounts and to access customized information. Most of the mobile money offered by most banks includes performing balance checks, account transactions, payments, credit applications and other banking transactions such as to buy airtime.

Even though mobile money has not been well defined in literature it can be said to include all the various initiatives (long-distance remittance, micro-payments, and informal air-time battering schemes) aimed at bringing financial services to the unbanked using mobile technology (Orozco, 2007). However, Jenkins (2008) defined Mobile Money as money that can be accessed and used via mobile phone. With an increasingly, widespread use of mobile phones by consumers in the emerging markets, mobile money is not just a fad but a great phenomenon. The introduction of prepaid cards and the fallen prices of mobile handsets have lead to a rapid spread of mobile phones in the emerging

economies (Orozco, Jacob and Tescher, 2007). This has opened up diverse opportunities for it to be used over and above voice communication.

1.1.2 Non-Performing Loans

A Commercial bank is a profit making institution which accepts deposits, makes business loans, and offers related services. Interest on loans makes the largest percentage of banks' income (Gaitho, 2010). However, the loan is a risk output owing to non-performance or defaults. A non-performing loan is a loan that is in default or close to being in default. Many loans become non-performing after being in default for 90 days but this can depend on the contract terms. A loan is non-performing when payments of interest and principal are past due by 90 days or more or at least 90 days of interest payments have been capitalized, refinanced or delayed by agreement, or payments are less than 90 days overdue, but there are other good reasons to doubt that payments will be made in full (Habane, 2012).

Nonperforming loans can be treated as undesirable outputs or costs to a loaning bank, which decreases the bank's performance. Non-Performing Loans (NPLs) reduces the liquidity of banks, credit expansion, it slows down the growth of the real sector with direct consequences on the performance of banks the firm which is in default and the economy as a whole. It also exposes banks to other myriad risks such as: credit risk, liquidity risk, market risk, operating risk, reputation risk and legal risk. Due to the nature of their business, commercial banks expose themselves to the risks of default from borrowers (Gaitho, 2010).

NPLs allow the government to reduce the size of transfers required to boost employment. The identification of needy firms and the tailoring of subsidies to each firm losses means that non-performing loans require much smaller transfers than either direct subsidies or low interest rate loans (Dwight, 2004). NPLs also address a key concern of governments, the efficient allocation of scarce resources to maintain political support. Macro factors such as the real effective exchange rate and growth in real GDP impacts significantly on the level of NPLs. Whenever there is deterioration in the international competitiveness of the domestic economy this translates into higher NPLs (Central Bank of Kenya, 2013). NPLs can be measured by non-performing loans net of provision of capital. This is calculated by taking the value of non-performing loans (NPLs) less the value of specific loan provisions as the numerator of and capital as the denomination (Warue, 2012). Another method of measuring NPLs is by non-performing loans to total gross loans. This is calculated by using the value of NPLs as the numerator and the total value of the loan portfolio (including NPLs and before the deductions of specific loan loss provisions) as the denominator (IMF, 2004; Banking Act, 2008).

1.1.3 Effect of Mobile Money on Non-Performing Loans

Since 2000, mobile phones industry has been fast growing, bringing with it a wide range of opportunities and threats. At the top of the pyramid, the mobile phone network providers and hardware supplies have been making huge profits over the last 10 years. At the bottom of the pyramid, the industry has provided a variety of opportunities for entrepreneurship and. Mobile banking services provide time independence, convenience and promptness to customers, along with cost savings. Mobile banking presents an

opportunity for banks to expand market penetration through mobile services (Lee and Kim, 2007).

The mobile phone has become "the single most transformative tool for development."Seventy five percent of the 4 billion mobile phones currently in use worldwide are in developing countries, and within the next decade there will be more mobile phone subscriptions in the world than people. A recent econometric study by the World Bank shows that, on average, an additional ten phones per one hundred people in a developing country boosts GDP growth by 0.8 percent (Klonner and Nolen, 2008).

Though mobile phones make communication easier, resulting in economic growth, they can also be useful for things other than simple communication. One such innovation is mobile money: using mobile phones to electronically store currency and pay for goods and services via short message service (SMS) (Waverman, Meschi and Fuss, 2005). Consumers, vendors, and financial institutions can transfer mobile money, denominated in either local currency or mobile minutes, easily and with low transaction costs. Because mobile money is a cheaper, safer, and more convenient way to transfer funds, and reduces the costs associated with saving and lending, consumers in developing countries are recognizing its benefits. Like the microfinance institution (MFI) model pioneered by Grameen Bank in the 1970s, mobile money has increased access to financial services. Working together, mobile money and commercial banks can expand access to financial services in developing countries (Mas and Morawczynski, 2009).

1.1.4 Commercial Banks in Kenya

Commercial banks offer a wide range of financial services such as: deposit, loan and trading facilities (Radha, 2010). Besides, they play a number of roles in the financial stability and cash flow of a countries private sector. They process payments through a variety of means including telegraphic transfer, internet banking and electronic funds transfers. Commercial banks issue bank checks and drafts, as well as accept money on term deposits. Commercial banks also act as money lenders, by way of installment loans and overdrafts. Loan options include secured loans, unsecured loans and mortgage loans (Central Bank of Kenya, 2013).

In Kenya, there are 43 licensed commercial banks comprise of 30 locally-owned of which 2 are public shareholding and 28 privately owned, and 13 foreign-owned banks. Among the commercial banks, Information and Communication Technology (ICT) play a leading role in the success and progression of the industry. Banks have integrated their processes with mobile telecommunication platforms culminating into diversification of banking products as well as greater efficiency in service delivery to their customers (CBK, 2014a). The services provided include the transfer of funds between accounts, payments of utility bills, mobile airtime top ups, balance enquiries, loan applications, and cheque book requests. The Industry's gross loans and advances grew from Ksh. 1.58 trillion in December 2013 to Ksh. 1.69 trillion in March 2014 while (NPLs) increased by 16.1 percent from Ksh. 81.9 billion to Ksh. 95.1 billion within the same period (CBK, 2014b). The increase in mobile money and NPL, while being a cost or expense and credit risk to banks, motivates this study.

1.2 Research Problem

Non-performing loans are dangerous not only for the economy of one country but also for the whole world as we have seen the financial crisis created by these loans in East Asian countries, America and Sub-Saharan Africa (Adebola, Wan Yusoff, & Dahalan, 2011). Kenya has not been exempted from the problem of non- performing loans which had negative effects both to the lending institutions and the economy as a whole. To the commercial banks, non performing loans lead to losses which may lead to their collapse as witnessed in some commercial banks in Kenya in the 90s. The recovery costs involved increase bank's expenditure which leads to a negative impact on its balance sheet, hence lowering its net profit. To the country's economy, non performing loans lead to a slow economic growth (Espinoza & Prasad, 2010).

Non-performing loans are not only the problem in Kenya but also the problem of whole world so we focus on the studies conducted in the countries other than Kenya. Salas and Saurina (2006) conducted a research in Spain to identify the factors which explains the variation in non-performing loans from 1984-2003 according to the authors high interest rates, GDP growth and soft credit conditions determine the non-performing loans. Another study conducted in UK by Hoggarth, Sorensen and Zicchino (2005) considering time period between 1988-2004 according to the author's inflation and interest rates have positive relationship with the non-performing loans. Vogiazas & Nikolaidou (2011) investigated determinants of non-performing loans in the Romanian banking sector during the Greek crisis by taking the data from December 2001 to November 2010 according to them construction and investment expenditure, unemployment and inflation rate and Romania's external debt to GDP and M2 (narrow money and intermediate

money) influence the credit risk of country's banking system. Berger and Mester (2003) indicated that lower nonperforming loans improve productivity over time by reducing the costs associated with managing problem loans. From the above, none of the studies have talked about the effect of mobile money on variables which cause changes to the level of NPL's in commercial banks like; interest rate, growth in GDP, inflation or unemployment in the economy.

Locally, a study done by Ochami (2004) assessed the factors that contribute to the level of performing loans on Housing Finance Company Kenya Limited, the study found out that credit risk management and the external environment were major contributors of NPLs. Ngugi (2001) looked at the interest rate spread on the level of non-performing assets as a major contributor to NPLs, the difference between gross cost of borrowing and the net return on lending defines the intermediary costs. Waweru and Kalani (2009) in his study on banking crisis found NPLs to be a major contributor. Warue (2010) did a study on macro and microeconomic determinants of NPLs and found that employment rate, income and bank structures significantly affect NPLs.

However, these studies did not look at how mobile money affects non-performing loans despite the increase adoption on mobile money by commercial banks and uptake by customers. This study therefore filled this knowledge gap by investigating the significance of effect of mobile money on NPLs and moderated/isolated its effect by include ancillary variables affecting NPLs like interest rate, growth in GDP, inflation, or unemployment in the economy. It also addressed this question: what are effects of mobile money on non-performing loans in commercial banks in Kenya?

1.3 Objectives of the Study

This study examined the effects of mobile money on non-performing loans in commercial banks in Kenya.

1.4 Value of the Study

This study aimed at assessing the sensitivity of non-performing loans to interest rate, growth in GDP, inflation, exchange rate or unemployment in the economy, on the level of NPLs in Kenyan commercial banks. This is because the aim of every profit making organization is to post benefits to its stakeholders. Mobile money services in the Kenyan commercial banks translate directly to economic growth. This research reinforced the body of knowledge relating to management of non- performing loans in commercial banks.

The stakeholders of such commercial banks would derive benefits from the organizations in form of revenue when the banks' profitability is increasing. These stakeholders include; the employees of the commercial banks, suppliers, and shareholders and customers. The existence of the problem of non- performing loans is a big impediment to the stakeholders' benefits. By curtailing their existence, stakeholders may stand a good chance of deriving full benefits from the commercial banks.

As for scholars and academicians, this study might be important in providing information on mobile money and NPLs. Nevertheless, the research also suggested areas of further studies where future scholars and researchers may seek more knowledge or better still corroborate emerging theories. This research may also form a basis for further research

by other researchers on the effects of mobile money on non-performing loans on general performance of commercial banks.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews and discusses the literature pertinent to the development of an instrument that explains the relationship between variables of non- performing loans. It discusses the theories used for the study, determinants of non-performing loans, and finally discuss the empirical literature on non-performing loans.

2.2 Theoretical Review

If a bank's asset quality is inadequate (e.g. the loan amount becomes the amount to be collected), the bank will have to increase its bad debt losses as well as spend more resources on the collection of non-performing loans. This increase in non-performing loans in the banking industry can be due to poor credit policies (Berger and DeYoung, 1997). On the other hand, Obamuyi (2007) also suggest that credit risk management in the banking firms might affect the non-performing loans in the banking industry. The bad management hypothesis was developed to explain this relationship.

Gaitho (2010) argue that bad management of the banking firms will result in banks inefficiency and affects the process of granting loans. The banks' management might not thoroughly evaluate their customers' credit application due to their poor evaluation skills. In addition, the problem of asymmetric information between lenders and borrowers further complicates the matter. Besides that, the management might not be efficient in

managing loan portfolios. Consequently, this leads to lower credit ratings for the approved loans and high probability of default resulting in higher non-performing loans.

2.2.1 Agency Theory

Agency theory has its origins in the 1960s and 1970s by Stephen Ross and Barry Mitnick, who were responsible for economic and institutional theory of agency respectively (Ross, 1973; Mitnick, 1974, 2006). Agency theory extends the analysis of the firm to include separation of ownership and control, and managerial motivation (Eisenhardt, 1989). In the field of corporate risk management agency issues have been shown to influence managerial attitudes toward risk taking and hedging, (Smith and Stulz, 1985). Theory also explains a possible mismatch of interest between shareholders, management and debt holders due to asymmetries in earning distribution, which can result in the firm taking too much risk or not engaging in positive net value projects, (Mayers and Smith, 1987). Consequently, agency theory implies that defined hedging policies can have important influence on firm value (Fite and Pfleiderer, 1995). The latter hypotheses are associated with financing structure, and give predictions similar to financial theory.

2.2.2 Deflation Theory

The first is deflation theory (Fisher, 1933), which suggests that when the debt bubble bursts the following sequence of events occurs; debt liquidation leading to distress selling and contraction of deposit currency, as bank loans are paid off. This contraction of deposits cause a fall in the level of prices, which leads to greater fall in the net worth of business, hence precipitating bankruptcies which leads the concerns running at a loss to make a reduction in output, in trade and in employment of labour. The cycles cause

complicated disturbances in the rates of interest and a fall in the money value. The complicated disturbances described above can be summed as both external and internal forces (macro and micro factors) influencing state of over-indebtedness existing between, debtors or creditors or both which can compound to loan defaults.

2.2.3 Ownership Structure Theory

The third theory, ownership structure theory was pioneered by Jensen (1976) integrated the elements of theory of property rights, Ronald (1937), the theory of agency, Ross(1973) and Mitnick (1974) and the theory of finance, Minsky (1974). The theory explains why highly regulated industries such as public utilities or banks have higher debt-equity ratios for equivalent levels of risk that the average non-regulated firm. Jensen (1976) argues that, "ownership structure" rather than "capital structure" is the crucial variables to be determined, not just the relative amounts of debt and equity but also the fraction of the equity held by the manager. Relating to this study, the Kenya banking industry is composed of various categories of banks based on different ownership structure with different percentage in shareholdings. Ownership structure theory is appropriate for this study in that NPL levels are investigated on basis of bank ownership structure dependence.

2.3 Determinants of Non-Performing Loans

This role played by NPLs in triggering financial crises in Latin America, Sub-Saharan African, East Asia countries and lately sub-prime loans cannot be deemphasised. This has rekindled interest in investigating the factors responsible for financial exposure; as

investigators believe that once the factors are clearly identified, then future occurrence may be easily prevented.

2.3.1 Interest Rate

Lending rates/interest rates are one of the primary economic determinant of non-performing loans/bad loans. An increase in interest rate weakens loan payment capacity of the borrower therefore non-performing loans and bad loans are positively correlated with the interest rates (Nkusu, 2011). As far as interest rate policy is concerned it plays very important role in NPLs growth rate in a country/economy, Hoque and Hossain (2008) examined this issue and according to them non-performing loans are highly correlated with the high interest rates which enhances the debt burden of the borrowers and causes loan defaults.

Financial institutions facilitate mobilization of savings, diversification and pooling of risks and allocation of resources (Collins *et al*., 2011). However, since the receipts for deposits and loans are not harmonized, intermediaries like banks incur certain costs (Ngugi, 2001). They charge a price for the intermediation services offered under uncertainty and set the interest rate levels for deposits and loans. The disparity between the gross costs of borrowing and the net return on lending defines the intermediary costs which include information costs, transaction costs, administration, default costs and operational costs (Rhyne, 2002). Interest rate spread is well-defined by market microstructure characteristics of the banking sector and the policy environment (Ngugi, 2001). Nkusu (2011) listed several reasons for high interest rate spread which included: lack of sufficient competition, diseconomies of scale due to small size of markets, high

operating and fixed costs, high transportation cost of funds due to expensive telecommunications, existence of regulatory controls and perceived market risks.

Espinoza and Prasad (2010) examined the macroeconomic determinants of non-performing loans in the GCC banking system according to them high interest rates increases loan defaults but they did not find statistically significant relationship. Bloem and Gorter (2001) studied causes and treatment of NPLs, according to them frequent changes in the interest rate policy causes an increase in the bad loans. Asari, *et al*. (2011) also found significant relationship between loan defaults and interest rates they also found that an increase in loan defaults also causes asset corrosion of banks and subsequently capital erosion. According to Dash and Kabra (2010) the banks with aggressive lending policies charging high interest rates from the borrowers incur greater non-performing loans. Collins and Wanjau (2011) also found interest rate as a primary factor boosting non-performing loans.

2.3.2 Growth in Gross Domestic Product (GDP)

There is a significant empirical evidence of negative association between growth in gross domestic product and non-performing loans (Louzis, Vouldis and Metaxas 2011, Khemraj and Pasha (2009), Salas and Suarina, 2002; Rajan & Dhal, 2003; Fofack, 2005; and Jimenez and Saurina, 2005).

Looking into the explanation of the negative relationship provided by the literature, one finds that growth in the gross domestic product usually increases the income which ultimately enhances the loan payment capacity of the borrower which in turn contributes to lower bad loan and vice versa (Khemraj and Pasha, 2009).

2.3.3 Inflation

There is an empirical evidence of positive relationship between the inflation in the economy and non-performing loans (Khemraj and Pasha, 2009, Fofack 2005). While Nkusu, (2011) has explained that this relationship can be positive or negative according to the author inflation affects loan payment capacity of borrowers positively or negatively, higher inflation can enhance the loan payment capacity of borrower by reducing the real value of outstanding debt; moreover increased inflation can also weaken the loan payment capacity of the borrowers by reducing the real income when salaries/wages are sticky, moreover by highlighting the role of inflation in the presence of variable interest rate Nkusu further explains that in this scenario inflation reduces the debt servicing capacity of the loan holders as lenders adjust the lending interest rates to adjust their real return. So according to literature relationship between inflation and non-performing loans can be positive or negative depending on the economy of operations.

2.3.4 Unemployment

There is an empirical evidence of positive relationship between unemployment in the economy and non-performing loans (Nkusu, 2011, Vogiazas & Nikolaidou, 2011; Bofondi and Ropele, 2011; Berge and Boye, 2007; Rinaldi and Sanchis-Arellano, 2006; Gambera, 2000).

As far as theoretical explanation of this relationship is concerned an increase in the unemployment in the country negatively affects the incomes of the individuals which increases their debt burden, it is obvious when a person losses his source of income how he can return his loan, similarly an increased unemployment in the economy also

negatively affects the demand of the products of firms which ultimately affects the production/sales of the firms, this ultimately leads to decline in revenues of the firms and a fragile debt conditions (Louzis, Vouldis and Metaxas, 2010).

2.3.5 Credit Information Sharing

The credit information sharing contributes significantly to reduction in the costs of screening loan applications by enabling the lender to sort out prospective borrowers who have defaulted with other lenders. Credit References Bureaus are information brokers, providing creditors with reliable, relevant and comprehensive data on the repayment habits and current debt of their credit applicants (Sinare, 2008). According to Lewis (2004) most banks and most creditors prefer hard collateral-based credit but would extend cash flow- based credits if they can use a reliable and inexpensive system to exchange information on the character and ability to pay of borrowers. Experience has revealed that when financial institutions compete with each other for customers, multiple borrowing and over-indebtedness increases loan default unless the financial institutions have access to databases that capture relevant aspects of clients' borrowing behavior.

Credit reporting allows banks to better distinguish between good and bad borrowers. Based on evidence from several countries, Armstrong (2008) showed that the existence of credit information sharing is associated with increased lending volume, decline in loan defaults, improved access to financing and a more stable banking sector. Credit information sharing makes it difficult for lenders to price the risks because the borrowing costs of borrowers are not the same and that should be reflected in the interest rate pricing (Paydaycash, 2010).

2.4 Empirical Literature Review

Arpa, Giulini, Ittner, & Pauer (2001) assess the effects of macroeconomic developments on risk provisions (calculated as the ratio of total provisions for loans to the sum of total loans and total provisions for loans) of Austrian banks for the period 1990–1999. They use a single-equation time series model in which the dependent variable, i.e. banks' risk provisions, is regressed on the growth rate real gross domestic product, real estate price developments and real interest rates. The estimated model delivers a good empirical fit and all explanatory variables are highly significant. In particular, risk provisions rise when real gross domestic product growth declines, real interest rates fall and real estate prices increase. However, the authors consider the last-mentioned result at odds with expectations, because one would expect the value of mortgages to increase that when real estate prices rise, thus reducing the likelihood of loan losses.

Kalirai and Scheicher (2002) employs a simple linear regression to examine the interdependence of credit risk for Austrian banks and the state of the economy, portrayed by real gross domestic product, industrial production, consumer price inflation, money growth, interest rates, stock market indices, and other macroeconomic indicators. According to their estimates, during the period 1990–2001 the loan quality was influenced in particular by the short-term nominal interest rate, industrial production, the stock market return and a business confidence index.

Shu (2002) used a similar single-equation time series model to examine the impact of macroeconomic developments on loans quality in Honk Hong for the period 1995–2002. The results show that the ratio of bad loans to performing loans falls with higher real

gross domestic product growth, higher consumer price inflation rate and higher property prices growth, whereas it rises with increases in nominal interest rates. The unemployment rate and performance of equity prices growth are not significant.

The study done by Khemraj (2005), to ascertain the determinants of non-performing loans in the Guyanese banking sector using a panel dataset and a fixed effect model similar to Jimenez and Saurina (2005). Their empirical results show that GDP growth is inversely related to non-performing loans, suggesting that an improvement in the real economy translates into lower non-performing loans. They also found that banks which charge relatively higher interest rates and lend excessively are likely to incur higher levels of non-performing loans. In this study the researcher did not talk about credit risk management which can reduce the volatility in non-performing loans.

Chang (2006) examined non-performing loans (NPLs) and capital adequacy in banking structure and competition in entire commercial banking sector in Korean between 1976 – 2003, this paper analysed the impact of the transition from price-cap regulation (deposit/loan rate control) to rate-of-return regulation (ROA, NPLs and / or BIS ratio) on banking industry structure. A simple theoretical model of banking competition suggests that the relative dominance of the two objective functions under different regulatory regimes affects the market structure. Imposing more stringent rate-of-return regulation, whilst relaxing price-cap regulation, reduces the equilibrium number of banks.

Yixin (2006) looked into the non performing loans problem in Japanese commercial banks. Using the threshold regression technique, he found that some evidences that non-performing loans have non-linear negative effect on banks' lending behaviour. They

found that non-performing loans don't deter banks risky lending. The prolonged economic stagnation distorts the generally economic performance. The researcher looked into the negative effects of NPL's and never mentioned measures of control of NPL's.

A study carried out by Mathews, Guo and Zhang (2007) on non-performing loans and productivity growth of the nationwide banks of China over the ten year (1997 to 2006). Using a bootstrap method for the Malmquist index estimates of productivity growth are constructed with appropriate confidence intervals. The paper adjusted for the quality of the output by accounting for the non-performing loans on the balance sheets and test for the robustness of the results by examining alternative sets of outputs. The paper found that average productivity of the Chinese banks improved modestly over this period. The researcher carried the study to determine how NPL's affect the productivity growth in China banks but he did not consider the factors that determine the level of NPL's and the factors to hedge to manage the NPL's.

Njanike (2009) investigated the impact of effective credit risk management on bank survival. The study sought to evaluate the extent to which failure to effectively manage credit risk led to Zimbabwe's banks' demise in 2003/2004 bank crisis. It also sought to establish other factors that led to the banking crisis and to outline the components of an effective credit risk management system. The study found that the failure to effectively manage credit risk contributed to a greater extent to the banking crisis. The research also identified poor corporate governance, inadequate risk management systems, ill planned expansion drives, chronic liquidity challenges, foreign currency shortages and diversion from core business to speculative non-banking activities as other factors that caused the crisis.

A study by Karim, Chan, Hassan (2010) on bank efficiency and non-performing loans investigated the relationship between non-performing loans and bank efficiency in Malaysia and Singapore. To achieve the objective, cost efficiency was estimated using the stochastic cost frontier approach assuming normal-gamma efficiency distribution model proposed by Greene (1990). The cost efficiency scores were then used in the second stage Tobit simultaneous equation regression to determine the effect of non-performing loans between banks in Singapore and Malaysia although banks in Singapore exhibit a higher average cost efficiency score. The Tobit simultaneous equation regression results clearly indicate that higher non-performing loans reduce cost efficiency. Likewise, lower cost efficiency increases non-performing loans. The results also support the hypothesis of bad management proposed by Berger and DeYong (1992) that poor management in the banking institutions results in bad quality loans, and therefore escalates the level of non-performing loans. The researcher did not clearly define the factors or the variables that determine the bank efficiency which lead to the level of non-performing loans.

Ochami (2004), investigated on the assessment of factors that contribute to the level of non-performing loans in Housing Finance Company of Kenya Limited. To achieve the objective of assessment, primary data of the research was collected by way of structured questionnaire from the staff of Housing Finance Company of Kenya Limited. The data was then analysed using tables and descriptive statistics; the deduction there from was used to assess the factors that contribute to the level of non loans in Housing Company Kenya Limited. The study found out from the assessment carried out, that credit risk management and the external environment were major contributors to the level of non-

performing loans. The study did not test how the credit risk management with given variables impact on the level of non-performing loans through a scientific model like multiple regression model.

Waweru (2009), conducted a study to investigate the commercial banking crisis in Kenya, causes and remedies, according to the study many financial institutions that collapsed in Kenya since 1986 failed due to non-performing loans. Using a sample of 30 managers from the ten largest banks the study found that national economic downtown perceived as the most important external factor. Customer failure to disclose vital information during the loan application process was considered to be the main customer specific factor. The study further found that lack of an aggressive debt collection policy was perceived as the main bank specific factor, contributing to the loan performing debt problem in Kenya. The researcher only considered only one customer's specific factor, that is, disclosure of vital information he did not consider factors like the age of the customer, the level of income, the purpose of the loan.

Irungu (2009) carried out a study to investigate pressure of bad loans burden on Kenyan banks found that the continuing build up loans burden is causing stress in a number of Kenyan banks, prompting the International Monetary Fund (IMF) to demand increased vigilance from the regulator. The IMF used CAR which measures the level of capitalization against its total assets. The higher the ratio the more stable a bank is. Kenyan banks have a minimum of 12 percent CAR. High capital to asset ratio means an institution is better protected against operating losses than those with lower ratios. The researcher did not define clearly what causes these bad loans and if there is any strategy

to reduce the pressure of bad loans. He never mentioned the results of CRM on NPL's level.

A study by Warue (2010) on the effects of bank specific and macroeconomic factors on nonperforming loans in commercial banks in Kenya. The main goal of this study was to investigate the link between NPLs and bank-specific and macroeconomic factors, and establish the extent to which these factors affect the occurrence of non-performing loans in commercial banks in Kenya. The study used panel econometrics approach employing both pooled (unbalanced) panel and fixed effect panel models. The study found evidence that per capita income was negative and significantly related to NPL levels across bank size categories. The study considered only macroeconomic factors like GDP and bank specific factors like bank structures but it did not factor in any customer specific factors like the age, the purpose of the loan and the level of education.

2.5 Summary of the Literature Review

Several studies have investigated the factors influencing or determinants of non-performing loans in both Kenyan context and beyond. Studies on bank efficiency and non-performing loans established that lower cost efficiency increases non-performing loans and lack of an aggressive debt collection policy and customer failure to disclose vital information during the loan application process were the main contributors to the loan performance in Kenya. However, these studies did not factor in any customer specific factors like the age, the purpose of the loan and the level of education. Thus, the previous studies did not assess the causes of non-performing loans neither did they seek to establish the effect of mobile money on the same hence the need for this study.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the research design, sample design, target population, data collection methods, data analysis, and ethical issues of the study.

3.2 Research Design

The study used a descriptive research design. Descriptive research design describes the characteristics of the variables interest in a situation. The goal of a descriptive study is to offer the researcher a profile or descriptive relevant aspects of the phenomenon of interest from an individual organizational industry oriented or other perspective.

This design is defined by Thornhill (2000) as a study which seeks to establish causal relationship between variables with main emphasis being to study a problem in order to explain the relationship between variables. It aims at explaining how one variable produces changes in the other. This study sought to explain the significance of interest rate, growth in GDP, inflation, exchange rate or unemployment in the economy on the level of Non-Performing Loans hence it is a cause-effect investigation. At the end, the researcher established whether the relationship exist or not and make conclusions based on the relationship established.

3.3 Population

The population consisted of commercial banks in Kenya licensed by the Central Bank of Kenya by 2012. By 2012, there were 43 commercial banks. In Kenya most banks have three divisions: corporate division which specializes on corporate or big companies or organizations, Small & Medium Enterprises (SME) division which target average business organizations and retail division which serves individuals.

The bulk of banks customers were in retail division followed by SME and lastly corporate division. However, most banks lent more to the corporate division while others had their loan portfolio concentrating mostly to retail and SME especially upcoming banks. Moreover, majority of banks had their corporate division centralized in Nairobi while small SME division and retail division were decentralized in branches all over the country. The target population was all the commercial banks and observation unit from which data was collected from all the listed banks.

3.4 Data Collection Methods

From the conceptual framework this study had six independent variables and one dependent variable. The dependent variable was Commercial banks Non-Performing Loans which was measured in quantitative terms. Data on the independent variables was collected from the 43 commercial banks. It is always a regulatory requirement for commercial banks to report their Non-Performing Loans data to the Central Bank of Kenya periodically as part of the returns. Therefore, data about the dependent and independent variables was collected from the CBK using secondary data collection guide/form. The secondary data collected were: total loan and advances, total non-

performing loans, mobile money transaction volume, average transaction cost, gross domestic product, unemployment rate, and interest rate on loans. All these were collected using secondary data. The credit managers through their staff provided additional qualitative information on how mobile money influences non-performing loans in their banks.

3.5 Data Analysis

Data was collected using document analysis and questionnaire. The data was analyzed and presented qualitatively and quantitatively. Data collected was coded, tabulated and presented according to each independent and dependent variable. Descriptive study was conducted on data. This involved the use of frequencies in their absolute and relative forms (percentage). Mean and standard deviations was also used as measures of central tendencies and dispersion respectively. Descriptive statistics were also used in the secondary data as a preliminary analysis and to summarize the data obtained from the afore-mentioned source. In the secondary data, mean, standard deviation, minimum and maximum values and quartile values were considered. Other measures of distribution such as skewness and kurtosis were used. Inferential statistics were conducted using multiple linear regression to analyze the data.

3.5.1 Regression Model

From the regression model below, the dependent variable was commercial banks' non-performing loans ratio, while the independent variables were mobile money transactions (MTS) volume and average transaction cost for MTS. The study introduced control

variables that might have effect on loan non-performance such as GDP value, unemployment rate and interest rate on loans.

$Y = ß_0 + ß_1X_1 + ß_2X_2 + ß_3X_3 + ß_4X_4 + ß_5X_5 + e$

Y- Is the dependent variable (NPL Ratio as measured by the ratio of non-performing loans to total loan advanced);

$ß_0$ - the constant; $ß_1$, $ß_3$, $ß_2$, $ß_3$, $ß_4$ – are regression coefficients or change induced in Y by each X variable;

X_1 – Mobile Money Transactions (standardized for size of the bank by the ratio of the volume of mobile money transactions in Ksh and total assets);

X_2 – Average Transaction Cost for MTS measured by the proportionate average cost in doing mobile money transactions as incurred by customers (transfers, withdrawals and fixed charges);

X_3 – Natural Logarithm of GDP measured by the aggregate value of national output;

X_4 – Unemployment Rate measured by the ratio of the unemployed persons (but have been looking for employment in the past one year) over those aged between 18 to 60 years;

X_5 – Interest Rate on Loans is measured by the average lending rate on: long and short-term loans, overdrafts, mortgages, personal and corporate loans; and,

e – error term.

The study used the regression coefficients to test the magnitude of the relationship between mobile money and nonperforming loans. The study applied f and t-significance from ANOVA to establish the significances of such relationship. ANOVA was used as it

compares group means by analyzing comparisons of variance estimates; that is, whether or not the means of several groups are all equal. This helped the study establish whether there is a significant relationship between the dependent and independent variables, hence the significance of the regression model. ANOVAs was helpful as they possess an advantage over a two-sample t-test which might results in an increased chance of committing a type I error (error of rejecting a null hypothesis when it is actually true). The study used Pearson correlation coefficient to test the null hypotheses that mobile money has no significant relationship with NPLs against alternative hypothesis of significant relationship.

A correlation coefficient values ranging between -1 and 1 which measures the degree to which two variables are linearly related with the higher magnitude indicating higher degree of association between two variables. Cohen (1988) observed that that a correlation coefficient of magnitude 0.3–0.5 shows a medium linear dependence between two variables while 0.5 to 1.0 shows a strong linear dependence. According to Rohlf and Sokals' (1995) critical values for the correlation coefficient, using 26 degrees of freedom a critical value for correlation is 0.576 at 0.05 error margin.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

The main objective of the study was to examine the effects of mobile money on non-performing loans in commercial banks in Kenya. The study targeted 43 commercial banks where the study used descriptive and inferential analytical techniques to analyze the data obtained. The study used Ordinary Least Squares (OLS) regression models. However, before running the regressions, descriptive statistics and correlation analysis were calculated. Correlation analysis shows the relationships between the different variables considered in the study. The correlation matrix presented simple bivariate correlations not taking into account other variables that may influence the results.

4.2 Descriptive Analysis

Table 4.1 presents the descriptive statics and the distribution of the variables considered in this research: Non-performing loans, Mobile Monet Transactions, Average Transaction cost, Interest rates, GDP and unemployment rate. The descriptive statistic considered were minimum, maximum, mean, standard deviation.

Table 4.1 shows that the ratio of non-performing loans to total loans advanced by the commercial banks had a mean of 0.2419 and standard deviation of 0.0988834. That is, NPL ratio, on average, 24.19% of the loan advanced by the commercial banks were defaulted by borrowers. However, the value went as high as 34.85% and as low as 9.23%. The average MMT for the 43 commercial banks was 37.118% which implies that the

proportion of volume of mobile money transaction to total assets on average was 0.37118. From the study summary it was established that average transaction Cost for MTS measured by the proportionate average cost in doing mobile money transactions as incurred by customers (transfers, withdrawals and fixed charges) was 27.34 millions in Kenya Shillings on average. ATC recorded 40.851 millions Kenya Shillings on the maximum from 2004 to 2013. During the study period, Kenya recorded an average of 29.8154 billion Kenya Shillings in GDP growth with maximum value registering 45.384 billion in Kenya Shillings. Unemployment rate had an average of 9.43% compared to the minimum of 9.2% and maximum of 9.6%.

Table 4.1Descriptive Statistic

Variable	Obs	Mean	Std.Dev	Min	Max
NPL	10	0.2419	0.0988834	0.0923	0.3485
MMT	10	0.37118	0.06602	0.245	0.4529
ATC(Million)	10	27.3362	10.7942	10.526	40.851
Int	10	0.16247	0.042125	0.1225	0.2519
GDP(Billions)	10	29.8154	9.134761	16.095	45.384
Unemployment	10	9.43	0.133749	9.2	9.6

4.3 Correlation Analysis

Table 4.2 Correlation result

	NPL	MMT	ATCMil~n	Int	GDPBil~s	Unempl~t
NPL	1					
MMT	-0.6518	1				
ATCMillion	0.6791	0.9547	1			
Int	0.3825	-0.9128	-0.8803	1		
GDPBillions	-0.7683	0.9266	0.9682	-0.8073	1	
Unemployment	0.1943	-0.5117	-0.5767	0.6636	-0.4119	1

The study sought to establish the relationship between Mobile Money and non-performing loans of the 43 commercial banks in Kenya. Pearson Correlation analysis was used to achieve this end at 99%, 95% and 90% confidence levels. The result in table 4.2 above shows that NPL has a negative correlation (R=-0.6518) with mobile money transactions. This implies that an increase in mobile money transaction reduces the level of non-performing loans.

Average transaction has a positive relationship with non-performing loans (R=0.6791) which indicates that an increase in average transaction cost for mobile mobile money increases non-performing loans.

Interest rates has positive association (R=0.3825) with non-performing loans. Increasing interest rate spread will result to an increase in non-performing loans for the 43 commercial banks.

GDP is negatively correlated with non-performing loans which implies that increase in GDP growth results to a decrease in non-performing loans and unemployment rate is positively related to non-performing loans. Increase in unemployment rate result to an increase in non-performing loans.

4.4 Regression Models

4.4.1 Analysis of Variance

Analysis of Variance's (ANOVA) F-test was used to make simultaneous comparisons between two or more means; thus, testing whether a significant relation exists between variables (dependent and independent variables); thus, helping in bringing out the significance of the regression model. Since the value (p=0.0023) was below 0.05, it can be concluded that the regression model was significant and fit for estimation.

Table 4.3 Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	p.
1	Regression	.0769516	5	.015390	0.0605	.0023
	Residual	.0110497	4	.0027624		
	Total	.08800142	9			

4.4.2 Model Summary

Table 4.4 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.658056	.8744	.7175	.025801	1.9023

R-square values present proportion of the variation in non-performing loans that is attributed to the changes in the explanatory variables. From the adjusted determination coefficients, generally moderately strong linear relationships were established between dependent and independent variables. Their R-squared value of 87.44% was established and this implies that 87.44 % of the variation in non-performing loans is attributed to the changes in the independent variables.

The study also used Durbin Watson (DW) test to check that the residuals of the models were not autocorrelated since independence of the residuals is one of the basic hypotheses of regression analysis. Being that the DW statistic (1.859) was close to the prescribed value of 2.0 for residual independence, it can be concluded that there was no autocorrelation.

4.4.3 Regression Coefficients

NPL	Coef.	Std.Err	t	P>|t|	[95%Conf.Interval]
MMT	-1.99886	1.174255	-1.7	0.014	-5.259115 1.26139
lnATC	0.015176	0.012368	1.23	0.287	-0.019162 .049515
Int	3.18942	1.248112	-2.56	0.023	-6.654737 .275894
lnGDP	-0.02176	0.011102	-1.96	0.022	-2.052582 .00906
Unemployment	0.399691	0.25456	1.57	0.031	-2.307081 1.1064
_cons	-2.03324	2.221992	-0.92	0.012	-8.20247 4.1360

a. Dependent Variable: NPL

b. MMT, lnATC, int, lnGDP, Unemployment

All the explanatory variables are statistically significant at 5% level of significance in explaining the variation in non-performing loans for commercial banks except for average transaction cost which is insignificant in causing the variation in non-performing loans

From the analytical model, the estimated model becomes:

NPL = -2.0332 – 1.99886MMT + 0.0157ATC + 3.189Int – 0.02176GDP + 0.39969Unp

4.5 Summary and Interpretation of Findings

All factors held constant, the average non-performing loans for the commercial banks is negative 2.0332 million units. This implies that Kenya commercial banks will still experience non-performing equivalent to 2.0332 million units even in the absence of the variables included in the mode. Mobile money transaction is statistically significant at 5% level of significance in explaining the variation in non-performing loans for the commercial banks. Mobile money transaction negatively impacts on non-performing loans as indicated with negative regression coefficient. A billion unit increase in Mobile money transaction will result to 1.99886 million units decrease in non-performing loans.

At 95% confidence level, interest rate spread is statistically significant in explaining the variation in non-performing loans in commercial banks in Kenya. A unit increase in interest rate spread will lead to 3.189 units increase in non-performing loans. The finding is consistent with (Nkusu, 2011) who postulates that an increase in interest rate weakens

loan payment capacity of the borrower therefore increasing non-performing loans and bad loans. Dash and Kabra (2010) also argues that banks with aggressive lending policies charging high interest rates from the borrowers incur greater non-performing loans.

The result also indicates that average transaction cost positively influence non-performing loans. However, average transaction cost is not significant in explaining the variation in non-performing loans of the commercial banks.

GPD growth has a negative relationship with non-performing loans and has statistical significance at 5% level of significance in causing the changes in non-performing loans in commercial banks in Kenya. A unit increase in GDP growth will lead to 0.02176 units decrease in non-performing loans. The finding is in line with Louzis at el (2011) who found a significant empirical evidence of negative association between growth in GDP and non-performing loans. (Khemraj and Pasha, 2009) contends that growth in the gross domestic product usually increases the income which ultimately enhances the loan payment capacity of the borrower which in turn contributes to lower bad loan and vice versa.

The study also established positive association between unemployment rate and non-performing loans. There is statistical significance between unemployment rate and non-performing loans at 5% level of significance. A unit increase in unemployment rate will lead to 0.39969 units increase in non-performing loans. The result conforms to the theory that an increase in the unemployment in the country negatively affects the incomes of the individuals which increases their debt burden similarly an increased unemployment in the economy also negatively affects the demand of the products of firms which ultimately

affects the production/sales of the firms, this ultimately leads to decline in revenues of the firms and a fragile debt conditions.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

From data analyzed it is evident that mobile money does actually affect non-performing loans the higher the uptake of mobile money the lower the levels of non-performing loans and this lead to the recommendation that banks should invest more on technology to gain on the non-performing loans front.

5.2 Summary of Findings and Discussions

Analysis from the study result indicates a significant negative relationship between mobile money transfer and non-performing loans in commercial banks. This implies that an increase in mobile money transfer reduces the level of non-performing loans. This negative relationship is attributed to the diversity in mobile money transactions. The vast majority of money transfer in Kenya is through mobile money transfer. Consumers can deposit, withdraw and access their account statements through mobile banking. Mobile money has attributed to a reduction in non-performing loans through credit reference bureau and easy access to credit by the issuance of both debit and credit cards.

Credit cards are like micro loans advanced to consumer against their salary or the value of their savings with the bank. Credit limit is usually below the consumers' income. This is to reduce the level of credit risk since consumer only spends up to their limit of their financial constraints. Low income earners who pose the risk of loan default to bank can access credit from other mobile transaction. Central bank of Afrca (CBA) and

Safaricom partnerned to offer M-shwari product to consumers. Consumer's especially low income earners access credit facility through M-shwari thereby reducing the level of non-performing loans. Through mobile money, credit reference bureau collects data base on the consumer credit worthiness. These data are used by the commercial banks for making decision before advancing loan to consumers. This in effect reduces the level of credit risk hence low non-performing loan.

The study also found a negative relationship between interest rate and non-performing loan. Non-performing loans are highly correlated with the high interest rates which enhance the debt burden of the borrowers and causes loan defaults, Hoque at el (2008). Asari, *et al*. (2011) found significant relationship between loan defaults and interest. Loan defaults cause asset corrosion of banks and subsequently capital erosion which negatively impact on financial performance of the commercial banks. For instance, fixed interest contributes more to NPL since the cost interval is high making the borrower pay more at the end of the loan period than one should have under floating interest rates as fixed interest rates are loaded upfront. Floating interest rates interrupts borrowers' budget are interrupted hence they are unable to repay loans as planned given the unanticipated interest in business growth, vary throughout the year and interest doubles in case of default.

Economic growth is found to have a negative relationship with non-performing loans. Sound economic environment leading to economic growth reduces non-performing loan. Growth in the gross domestic product usually increases the income which ultimately enhances the loan payment capacity of the borrower which in turn contributes to lower bad loan and vice versa (Khemraj and Pasha, 2009). Therefore sound fiscal policy should

be adopted to enhance economic growth. Fiscal policies by the government like expenditure will create employment opportunity thereby reducing non-performing loan in the commercial banks.

5.3 Conclusions

From the findings summarized above, the study draws a number of conclusions. To begin with, the innovation of mobile money services in Kenya been a blessing to the banking sector as it has eased in inconvenience one cost by physical transactions. Banking has thus been moved from traditional brick-and-mortar to virtual existence where money is transferred from the comfort of customers' homes. Customer can transfer money, meant from loan repayments, from their mobile accounts to banks. This has helped reduce non-performing loans. Besides, mobile money has impacted the economic growth through facilitating various transactions at relatively cheap costs, ease of accessibility and operation. Mobile money reduces transaction costs, reduces risks of loss inherent in handling cash, and has proven to increase savings opportunities—based on evidence in Kenya, we know that the poor often use their m-wallets to save funds at least for short periods of time and are more likely to be able to have the cash needed to weather emergencies. This has made money available from which loans can be repaid.

Mobile money is a great contributor to reduction in non-performing loans and banks can use the technology to reduce the risk posed by non-performing loans. At the end, the researcher will establish whether the relationship exist or not and make conclusions based on the relationship established. GPD growth has a negative relationship with non-performing loans and has statistical significance at 5% level of significance in causing the

changes in non-performing loans in commercial banks in Kenya. A unit increase in GDP growth will lead to 0.02176 units decrease in non-performing loans. The finding is in line with Louzis at el (2011) who found a significant empirical evidence of negative association between growth in GDP and non-performing loans. (Khemraj and Pasha, 2009) contends that growth in the gross domestic product usually increases the income which ultimately enhances the loan payment capacity of the borrower which in turn contributes to lower bad loan and vice versa. The study also established positive association between unemployment rate and non-performing loans.

There is statistical significance between unemployment rate and non-performing loans at 5% level of significance. A unit increase in unemployment rate will lead to 0.39969 units increase in non-performing loans. The result conforms to the theory that an increase in the unemployment in the country negatively affects the incomes of the individuals which increases their debt burden similarly an increased unemployment in the economy also negatively affects the demand of the products of firms which ultimately affects the production/sales of the firms, this ultimately leads to decline in revenues of the firms and a fragile debt conditions. As such banks should invest more on technology

5.4 Limitations of the Study

The first limitation encountered was time constraint, the period from the data collection to finalizing the document was short and though all analysis was done further angles would have been explored in the study. The study would have benefited from an extended period of time from which extensive data would have been collected.

Secondary data was collected from the firm financial reports. The study was also limited to the degree of precision of the data obtained from the secondary source. While the data was verifiable since it came from the Central Bank publications, it nonetheless could still be prone to these shortcomings. The study was limited to establishing the effect of mobile money on the performance of commercial banks in Kenya.

The study was based on a five year study period from the year 2009 to 2013. A longer duration of the study will have captured periods of various economic significances such as booms and recessions, mobile banking infancy to growth. This may have probably given a longer time focus hence given a broader dimension to the problem. This would help form a longitudinal kind of analysis of each bank which would strengthen the study as internal environment might be different from one bank to the next making cross-sectional analysis used by this study a limitation.

In attaining its objective the study was limited to 43 commercial banks in Kenya. Micro finance institutions and DTMs were excluded since their operation is different from the one of commercial banks. The study could not therefore incorporate the impact on these of companies.

Changes in non-performing loans may have been affected by other factors other than those investigated by the study. Macroeconomic performance such as customers confidence in banks, the characteristics and banking regulations might have also moderated the changes. These factors could not be isolated in the study owing to difficulty in doing so. Besides, other financial innovations such as agency and internet banking could had an effect on loan repayments but was not subject of this study.

5.5 Recommendations

5.5.1 Policy Recommendations

Based on the study findings the banks should invest more on technology to increase the efficiency of mobile banking. Efficient use of mobile banking will reduce the level of credit risk among the commercial banks. Both staff and consumers should be trained to provide them with skills in the ever changing technology. The bank should also provide toll free line to enable customers who desire to use the system and also in case of any problem that deserve attention of the banking institution.

Agency banking should take a centre stage in the banking institutions short term strategic plans to deepen financial services further and ensure inclusion of the unbanked and the under banked as this is a huge market that remains a priority focus of the mobile money service providers. If possible banks should target to recruit as many agents as mobile money service providers have done as well as reduce agency banking fees to make their services affordable to both the rich and the have-nots.

Since cost of loans determines non-performing loans, the study recommends that commercial banks in Kenya should assess their customers and charge interest rates accordingly, as unproductive interest rate policy can increase the level of interest rates and consequently NPL. Given that the type of interest rates charged on loans dictates on the ability and flexibility of borrowers to repay loans, the study recommends that commercial banks should have a mixed interest rate policy as each type has its advantage and disadvantage

Banks ought to apply proficient and efficient credit risk management that will ensure that loans are harmonized with ability to repay, no or minimal insider lending, loan defaults are projected accordingly and relevant measures taken to minimize the same. The banks should also improve periodic credit risk monitoring of their loan portfolios to reduce the level of NPL.

5.5.2 Suggestions for Further Research

The study suggests that future studies might benefit at looking at how other financial innovations such as internet and agency banking affect non-performing loans in Kenya. This owes to the fact that, like mobile banking, these other transaction media and financial innovation might have effect on loan repayment.

Future studies on the same can be extended to include other financial subsectors such as MFIs and DTMs. MFIs and DTMs served different market segment and use financial innovations such as mobile money as transaction medium. Thus, the effect of mobile money on loan repayment might differ from that of banks. This would bring out a holistic picture on how mobile banking affect NPLs.

Future studies on the effect of mobile money on non-performing loans of commercial banks in Kenya can use primary data. This would be helpful in capturing the qualitative aspects of the relationship between the two variables. These studies can also seek the opinion of the customers on how mobile banking has affected their propensity to repay loans. This would help eliminate the bias of secondary data as some financial statement items are either overvalued or undervalued to escape statutory obligations such as payment of taxes.

The study suggests that future studies can be done over an extended period of time. This would enable collection of extensive data that would capture a wide variety of variables that are ancillary to non-performing loans that would help isolate the associative effect of mobile money on the same.

Future studies can also consider taking an extended period beyond five years. By doing so, the study can look at periods when there was no mobile money, when mobile money was at its infancy and during its growth. This would help form a longitudinal kind of analysis of each bank which would strengthen the study as internal environment might be different from one bank to the next making cross-sectional analysis used by this study a limitation.

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APPENDICES

Appendix I: Secondary Data Collection Form

Date:……..

Commercial Bank:……

Data	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Total Loan and Advances										
Total Non-Performing Loans										
NPL Ratio										
Mobile Money Transactions										
Natural Logarithm of Mobile Money Transactions										
Average Transaction Cost										

Macro-Economic Data

Data	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Gross Domestic Product										
Natural Logarithm of GDP										
Unemployment Rate										
Interest Rate on Loans										

Name of Researcher:……..

Signature:…….

Appendix II: List of Commercial Banks

1. ABC Bank (Kenya)
2. Bank of Africa
3. Bank of Baroda
4. Bank of India
5. Barclays Bank Kenya - Listed
6. CfC Stanbic Holdings - Listed
7. Chase Bank Kenya
8. Citibank
9. Commercial Bank of Africa
10. Consolidated Bank of Kenya
11. Cooperative Bank of Kenya - Listed
12. Credit Bank
13. Development Bank of Kenya
14. Diamond Trust Bank - Listed
15. Dubai Bank Kenya
16. Ecobank kenya
17. Equatorial Commercial Bank
18. Equity Bank - Listed
19. Family Bank
20. Fidelity Commercial Bank Limited
21. First Community Bank
22. Giro Commercial Bank
23. Guaranty Trust Bank Kenya
24. Guardian Bank
25. Gulf African Bank
26. Habib Bank
27. Habib Bank AG Zurich
28. Housing Finance Company of Kenya - Listed
29. I&M Bank - Listed
30. Imperial Bank Kenya
31. Jamii Bora Bank
32. Kenya Commercial Bank - Listed
33. K-Rep Bank
34. Middle East Bank Kenya
35. National Bank of Kenya - Listed
36. NIC Bank - Listed
37. Oriental Commercial Bank
38. Paramount Universal Bank
39. Prime Bank (Kenya)
40. Standard Chartered Kenya - Listed
41. Trans National Bank Kenya
42. United Bank for Africa
43. Victoria Commercial Bank

Appendix III: Summary of Inferential Table Results

Table 4.4Correlation result

	NPL	MMT	ATCMil~n	Int	GDPBil~s	Unempl~t
NPL	1					
MMT	-0.6518	1				
ATCMillion	0.6791	0.9547	1			
Int	0.3825	-0.9128	-0.8803	1		
GDPBillions	-0.7683	0.9266	0.9682	-0.8073	1	
Unemployment	0.1943	-0.5117	-0.5767	0.6636	-0.4119	1

Author: Research Findings

Table 4.5 Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	p.
1	Regression	.0769516	5	.015390	0.0605	.0023
	Residual	.0110497	4	.0027624		
	Total	.08800142	9			

Author: Research Findings

Table 4.4 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.658056	.8744	.7175	.025801	1.9023

Author: Research Findings

4.4.3 Regression Coefficients

NPL	Coef.	Std.Err	t	P>|t|	[95%Conf.Interval]
MMT	-1.99886	1.174255	-1.7	0.014	-5.259115 1.26139
lnATC	0.015176	0.012368	1.23	0.287	-0.019162 .049515
Int	3.18942	1.248112	-2.56	0.023	-6.654737 .275894
lnGDP	-0.02176	0.011102	-1.96	0.022	-2.052582 .00906
Unemployment	0.399691	0.25456	1.57	0.031	-2.307081 1.1064
_cons	-2.03324	2.221992	-0.92	0.012	-8.20247 4.1360

Author: Research Findings