EFFECT OF MOBILE LENDING ON THE LEVEL OF NON-PERFORMING LOANS IN THE KENYAN BANKING INDUSTRY

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DECLARATION

I, the undersigned, declare that this is my original work and has not been presented to any institution or university other than the University of Nairobi for examination.

Signed: _____ Date: 19/11/21

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D63/11140/2018

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

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DEDICATION

This research project is dedicated to Abdi Mohamed Ali, my family and colleagues.

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LIST OF ABBREVIATIONS

ANOVA Analysis of Variance

ATM	Automated Teller Machine
CBK	Central Bank of Kenya
GDP	Gross Domestic Product
IFE	International Fisher Effect
KNBS	Kenya National Bureau of Statistics
MFI	Micro Finance Institution
NPL	Non- Performing Loans
SME	Small and Medium Enterprises
SPSS	Statistical Package for Social Sciences
VIF	Variance Inflation Factors

ABSTRACT

In the Kenyan banking sector, mobile lending has been embraced by to reduce operational expenses and to enhance the volume of loans. At the same time, the number of nonperforming loans (NPLs) held by commercial banks has increased. The critical question is whether the rise in NPL results from mobile lending. Given that

mobile lending has already cost Kenya billions of shillings, it is critical to investigate the link between growing NPLs and mobile lending. It is critical to keep NPLs under control so that commercial banks' financial performance is not adversely affected. An increase in NPL among commercial banks if not checked can lead to huge losses in the banking sector and the effect would be felt in the entire economy. This research sought to bring out the effect of mobile lending on the level of NPLs in the Kenyan banking sector. Inflation, unemployment rate and interest rate were used as the control variables in the model. Descriptive research design was used. Research variables data were derived from CBK and KNBS from 2011 to 2020 on a quarterly basis. Regression and correlation analysis were used to test the study hypotheses by establishing the relationship between mobile lending and NPLs. The results indicated R^2 of 0.613 which implied that the selected independent variables contributed 61.3% to variations in NPLs. The study found that mobile lending (β=0.166, p=0.192) and interest rates (β=0.379, p=0.162) had a positive but not significant effect on the level of NPLs in the Kenyan banking sector. The study also found that inflation (β=0.348, p=0.021) and unemployment rate (β=0.767, p=0.000) had significant effect on the level of NPLs in the Kenyan banking sector. The study recommends that managers of commercial banks should keep offering mobile loans as this does not increase the risk of delinquent loans. Policy makers such as CBK should come up with policies and guidelines that would make it easy for banks to offer mobile loans to their clients. Further, the study recommends that policy makers should keep inflation and unemployment rate at low levels as these two adversely affects the level of NPLs.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

The introduction of mobile banking has enabled commercial banks reach a population that has been excluded from the traditional financial system. Theoretically, this would contribute to increased financial performance of the banks. Empirical evidence suggests otherwise though. World Bank (2016) has identified that mobile lending have had a positive effect on financial inclusion levels. Nevertheless, increase in financial inclusion did not always translate to superior financial performance for commercial banks. The correlation between mobile lending and financial performance was found to be insignificant. The most likely explanation of the findings is that an increase in mobile lending also comes with increased level of non-performing loans (NPLs) depleting the gains of increased financial inclusion and loan volumes.

This study was guided by; financial intermediation theory, stakeholder theory and information asymmetry theory. Financial intermediation theory by Mises (1912) is the anchor theory as it observes that through intermediation, financial institutions may create and provide customized financial solutions to meet the needs of each client. By doing so, the financial intermediaries enhance credit reach but this may also contribute to increase in NPLs. The theory links mobile lending and NPLs. Stakeholder theory by Freeman (1984) states that the credit market is determined by lender strategies and includes potential-client screening and addressing opportunistic behavior determined by the nature of loan contracts. For this reason lenders raise the price of credit to the level in which returns will be maximized. The theory of information asymmetry by Akerlof (1970) is fundamental in understanding the need

for disclosure in issuing loans. Credit risk is caused by unpredicted factors in the market that influence the level of NPLs.

The last decade has seen the banking sector in Kenya embrace mobile lending (Waithanji, 2016). Several of these lending have been enabled by working with telecommunications firms in the country such as Safaricom. The services often involve (relatively) short-term, high-interest loans. Banks utilize client cell phone information including, social media, transaction history of mobile, SMS record and calls for the evaluation of credit scores and loan amounts (Mohamed, 2018). M-Shwari is the most popular type of mobile lending being offered by NCBA followed closely by KCB MPESA. Fuliza is yet another mobile lending platform that was introduced in 2019 (CBK, 2019). The current study sought to investigate how this influences the level of NPLs among commercial banks as they have been on the rise.

1.1.1 Mobile Lending

Mobile lending has been defined us adoption of new financial technologies that helps financial institutions and other financial technology companies issue loans to qualified clients through mobile phones (Skarica, 2014). Mobile lending entails making investment utilizing cutting-edge technology in order to boost income and increase the system's efficiency and efficacy (Sheleg & Kohali, 2011). According to John, Fredrick and Jagongo (2014), mobile lending refers to new technologies that enable money transfer services and financial transactions that are regulated and carried out by financial institutions through mobile phone rather than conventional over-the-counter trades.

Mobile lending provides a range of technological options for comfort, faster reaction time and operating efficiencies (Klapper, 2016). Mobile lending allows for quicker

transaction, mobile transfer and also allows for cellular lending to individuals and small and medium enterprises (SMEs) (Yang & Liu, 2016). In addition, mobile lending combines financial services with current technology to provide user-friendly, automated, transparent, and efficient internet-based and application-oriented services (Triki & Faye, 2013).

In terms of operationalization, mobile lending has been measured either in terms of number of mobile loan applicants, value of mobile loans or as a proportion of mobile loans to total loans (Kigen, 2010). Others such as John et al. (2014) operationalized mobile lending as the availability, cost and amount of mobile loans issued. The current study operationalized mobile lending as the natural logarithm of the total value of mobile loans in a given period due to its wide applicability in previous literature.

1.1.2 Non-Performing Loans

Non-performing can be defined as loans that that remain outstanding for long periods of time usually more than 90 days late (Fofack, 2005). Ezeoha (2011) defined NPLs as those loans which are rolled over, where the borrower only services the interest rate while the principal amount or a fraction of it remains unpaid for a duration of more than 90 days. According to CBK (2019), NPLs are loans for which the principal or interest has been due as well as unpaid for 90 days or longer, or payment of interest have been repaid or rolled over into a new loan for 90 days or more.

The level of NPL is an important variable in the financial sector as high NPLs result in the reduction of banks' liquidity and credit expansion and this has an adverse effect not only on the commercial banks performance but also the performance of the entire economy (Kithinji & Waweru 2007). Furthermore, NPLs generate difficulty in

banking sectors' balance sheet asset side. NPLs also affect income statements by creating negative impacts due to provisions made for loan losses. High levels of NPLs towards banking systems endanger systemic risks that invite panic within deposits hence restricting financial intermediation, investments, together with growth. NPLs combined with external shocks together with inadequate political or legal support result in phases of greater economic cycles that are exacerbated (Brownbridge, 1998).

Several ratios are utilized in measuring NPLs. The ratios include delinquency rate which is obtained by diving total loan installments past due divided by total loan advances (Stanga, Vlahu & Haan, 2018). Saba, Kouser and Azeem (2012) operationalized NPLs as the absolute value of NPL in a given period. The most widely used measure is however the non-performing loans to total loans ratio as well as advances in a given period. The higher the ratio, the higher the credit risk. The current study operationalized the NPL level by the proportion of NPL to total loans and advances.

1.1.3 Mobile Lending and Non-Performing Loans

Financial intermediation theory by Diamond (1984) observes that through intermediation, financial institutions may create and provide customized financial solutions to meet the needs of each client. By doing so, the financial intermediaries enhance credit reach but this may also contribute to increase in NPLs. The theory links mobile lending and NPLs. Samuel (2011) notes that although banks have put measures to secure loans, mortgages and other securities, loan defaults has become part of the lending business.

World Bank (2016) has identified that mobile loans and mobile money have had a positive effect on financial inclusion levels. Nevertheless, increase in financial

inclusion did not always translate to superior financial performance for commercial Banks. The correlation between mobile lending and financial performance was found to be insignificant. The most likely explanation of the findings is that an increase in mobile lending also comes with increased level of NPLs depleting the gains of increased financial inclusion and loan volumes.

According to Kaaya and Pastory (2013), increase in the level of gross NPLs pause a great risk to financial institutions including commercial banks and the economy at large. High NPLs levels as a result of the crisis have a detrimental influence on credit availability and demand, decreasing lending to the real economy at a time when it is desperately required. Koki (2018) holds that although mobile lending leads to increased financial inclusion, it also comes with the risk of increase in the level of NPLs.

1.1.4 Banking Industry in Kenya

Commercial banking includes the activities of accepting deposits, extending credit, processing money transactions, and providing other financial services. The industry plays an important role in the financial sector, with a particular emphasis on the mobilization of savings and the supply of credit in the economy. According to the Annual Report on Bank Supervision (2020), the CBK is the regulatory body for the banking sector in Kenya. There is also 1 mortgage finance company, 42 commercial banks, and 13 microfinance companies in the industry. A significant portion of the country's 42 commercial banks are held by local residents, but a significant portion is controlled by international corporations. 11 of the 42 banks are listed at the NSE.

Mobile lending continues to change and shape the banking sector in Kenya. The Kenyan banking sector has focused increasingly on mobile lending and internet

lending as a strategic instrument to achieve organization goal of reducing costs and maximizing revenues. KCB has been promoting KCB MPESA and adopted fuliza in 2019, Equity has been using Equitel and Eazzy banking app, NCBA bank has been offering Mshwari and recently Fuliza. Other banks also have some aspect of mobile lending through their digital platforms (CBK, 2020). The big question is whether the financial performance resulting from the use of mobile lending has improved. This might not be a straight forward relationship as mobile lending comes with the risk of increased NPLs. CBK (2018) revealed that the level of NPLs have been on the rise over the years.

1.2 Research Problem

The infusion of mobile lending into the banking operations and services have provided a new cost effective alternative to enhancing financial inclusion and promoting access to credit by the poor, the rural population and the middle class (Koki, 2018). This has however come with the risk of increase in the level of Non-Performing Loans (NPLs) (Ugoani, 2016). According to Kaaya and Pastory (2013), increase in the level of gross NPLs pause a great risk to financial institutions including commercial banks and the economy at large. High NPLs levels as a result of the crisis have a detrimental influence on credit availability and demand, decreasing lending to the real economy at a time when it is desperately required.

In the Kenyan banking sector, mobile lending has been embraced by to reduce operational expenses and to enhance the volume of loans (Chishti, 2016). At the same time, the number of nonperforming loans (NPLs) held by commercial banks has increased. The critical question is whether the rise in NPL results from mobile lending. Given that mobile lending has already cost Kenya billions of shillings, it is

critical to investigate the link between growing NPLs and mobile lending. It is critical to keep NPLs under control so that commercial banks' financial performance is not adversely affected. An increase in NPL among commercial banks if not checked can lead to huge losses in the banking sector and the effect would be felt in the entire economy.

Empirical studies exist in this area. Globally, Wadhe and Saluja (2015) investigated how electronic banking impacts the profitability of Indian banks. The findings demonstrated that, in both private and public sector banks, electronic banking had a positive connection with profitability. Hujud and Hashem (2017) examined the connection between Lebanon's financial technologies and profit statuses of commercial banks and found that financial technologies have a positive and significant relation to profitability. Ndagijimana (2017) zeroed in on the impact of mobile lending on commercial banks' performance in Rwanda but did not address the level of NPLs. All of these investigations were conducted in a distinct setting, thus their results cannot be applied to the current situation.

Locally, Mutinda (2018) research showed that mobile banking has a significant negative link to profitability of Kenyan commercial banks in regards to technological developments in profitableness. In contrast, Kariu (2017) has investigated Kenya's financial technology and profits of commercial banks and found that financial technology has substantial positive connection with return of commercial bank. Those results are also contradicted by Kamande (2018), whose findings show that only banking agencies have a statistical positive connection with financial success, whereas mobile banking, online banking and ATMs are statistically insignificantly favorable about financial performance. The studies however did not establish the

effect of mobile lending on the level of banks NPL. This study was motivated by the fact that despite the existence of prior studies almost all prior studies have investigated the effect of electronic banking on financial performance leaving a gap on NPLs. Further, the studies have also not focused on mobile lending as they have focused on electronic banking as a whole. The current study was based on these gaps and attempts to answer the research question; how does mobile lending influence the level of NPLs in the Kenyan banking industry?

1.3 Research Objective

The objective was determining the effect of mobile lending on the level of non-performing loans in the Kenyan banking industry.

1.4 Value of the Study

This study's results will contribute to the existing theoretical and empirical literature on mobile lending and commercial banks level of NPLs. The findings will also help in theory development as they will offer insights on the shortcomings and relevance of the current theories to the variables of the study. Subsequent studies may also be carried out based on the recommendation and suggestions for further research.

The outcomes of the research may be relevant to the government and the regulator CBK in developing regulations for the population under consideration. The study's findings will help investors who are considering investing in the population under investigation by providing information on the risk-reward tradeoffs that exist in such institutions and their impact on overall performance.

The findings are intended to benefit managers responsible for managing of commercial banks as the study will give important information and recommendations that will be useful in making better decisions that will minimize NPLs. As a result,

they will be in a better position to develop suitable plans and practices for their institutions improved non-performing loans management.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter explains the theories on which mobile lending and NPLs was based. It further discusses the previous empirical studies, knowledge gaps identified and summarizes with a conceptual framework and hypotheses showing the expected relationship among the study variables.

2.2 Theoretical Framework

This segment examines the theories that underpin the study of mobile lending and non-performing loans. Theoretical reviews covered are financial intermediation theory, stakeholder theory and information asymmetry.

2.2.1 Financial Intermediation Theory

This theory was developed by Mises (1912) and it is the anchor theory of the current study. The theory asserts that banks are key participants in financial intermediation. Banks mobilize clients' money and provide it to those who are short on funds at a rate known as interest. An arrangement like this allows the banks to give the financial system a condition of liquidity, since short-term client money is taken and used to provide longer-term money for their customers (Dewatripont, Tirole & Rochet, 2010). According to the Austrian economist Ludwig von Mises (1912), banks have a central function as debt negotiators, as they lend money borrowed from the public.

The biggest criticism of the financial intermediation theory is its inability to give recognition to the role of lenders in the process of risk management (Levine et al., 2000). Scholtens and Van Wensveen (2000) stated that they do not recognize credit risk management as an important factor in the financial industry and emphasizing the

participation costs concept. They suggested future developments in the financial intermediation theory to understand challenges in the financial sector.

The theory is useful in examining the level of NPLs among banks as they take a number of risk measurements using modern technology in credit which involves the efficient collection of private details, treating, screening and monitoring borrowers. Financial intermediaries utilize mobile apps and other digital lending mechanisms that are useful in lowering transactional costs brought about by information asymmetry. They hence play a central role in effective functioning of financial markets. The theory is useful in understanding how mobile lending and NPL relate.

2.2.2 Stakeholder Theory

Freeman (1984) developed the theory which was to be utilized as a managerial tool. The theory has however developed to be a theory of the form which a high explanatory potential. It has similarities to a business ethics and a managerial tool covering moral and ethical management business principles. The focus of this theory is mainly on the equilibrium of stakeholder interests as a crucial corporate policy element. It significantly contributes to risk management because of its contribution to implicit contracts theory and other contract forms like, financing and sales (Cornell & Shapiro, 1987). In several industries like technology development, customer trust is valuable in maintaining the offering of such future services, and this improves firm value. The importance attached to such claims they depend on financial distress costs. The reason for this is that management behavior towards corporate risks can lower the foreseen costs thereby raising firm value (Klimczak, 2005).

The main criticism of the theory is by Key (1999) who noted that it may be an optimal model in explaining firm behavior which replaces the widely accepted view of the

firm's economic model. However, current conceptualizations fail to meet its scientific theoretical requirements. Hence research into the basis of stakeholder "theory", criticizes its forms, and suggests measures that will meet its conceptual requirements. Specifically, the studies imply the existence of contractual interests that underlie stakeholder relations similar to the management-shareholder relation under the traditional economic theory.

The relevance of the theory to the current study is that it gives a broad insight into feasible methods of managing risks like bad debts. A hypothesis that examines financial distress only shows indirect evidence and no direct testing of the theory has been done. The theory's relevance is it points out the effects of mobile lending on the level of NPLs in the banking sector.

2.2.3 Information Asymmetry Theory

Akerlof (1970) proposed this theory, which states that when borrowers and lenders interact, there is an information asymmetry. The assumption arises from borrowers who request for loans with no information on the possible risks associated with investment options on which the loan will be used. The lender on the other hand has no prior information on the investment by the borrower (Edward & Turnbull, 2013). Because none of them is privy to such information, adverse selection is generated thereby creating moral hazard issues (Horne, 2012).

Horne (2012) criticizes the theory stating two main reasons: signals influence information asymmetry which is not correct and investors that are heavily impacted upon by information asymmetry problems are ambiguously identified or misidentified. Stiglitz (1970) state that financial institutions write loan contractual terms seeking to attract borrowers to agree to their terms and to attract low risk credit

borrowers. The effect of this is the setting of rates of interest for which loan demand exceeds loan supply. The credit amount and the collateral amount also have an impact on credit-seeker character and distribution of the credit issued, and returns to lenders (Moti et al., 2012).

This theory is crucial in creating an understanding on the need to disclose information upon issuing loans in the sector. Increase in credit risk in the market is attributed to undisclosed factors that impact bank NPLs. The study hence seeks to examine how banks can make better appraisals using mobile APPs to lower the amount of losses and improve bank efficiency by maintaining good loans that are not declared delinquent. The theory is useful in explaining competitive market behavior. It has been utilized in many scenarios thereby confirming its credibility.

2.3 Determinants of Non-Performing Loans

There are several NPL determinants in a bank; these factors are found either within or outside the firm. Internal factors are firm-specific and can be manipulated internally. They are mobile lending, asset base, capital adequacy, ownership and liquidity. Factors outside a firm that influence NPL includes; interest rates, inflation, GDP, political stability and unemployment rate (Athanasoglou et al., 2005).

2.3.1 Mobile Lending

Mobile lending entails making investment utilizing cutting-edge technology in order to boost income and increase the system's efficiency and efficacy (Sheleg & Kohali, 2011). According to John, Fredrick and Jagongo (2014), mobile lending refers to new technologies that enable money transfer services and financial transactions that are regulated and carried out by financial institutions through mobile phone rather than conventional over-the-counter trades.

World Bank (2016) has identified that mobile loans and mobile money have had a positive effect on financial inclusion levels. Nevertheless, increase in financial inclusion did not always translate to superior financial performance for commercial Banks. The correlation between mobile lending and financial performance was found to be insignificant. The most likely explanation of the findings is that an increase in mobile lending also comes with increased level of NPLs depleting the gains of increased financial inclusion and loan volumes.

2.3.2 Interest Rate

The interest rate is regarded as funds outlay and an increase or decrease in the rate of interest may affect the financiers' savings decisions (Olweny & Omondi, 2016). Consequently, due to high production cost as well as hazards rate, as per Rehman, Sidek, and Fauziah (2009), the interest cap implementation drives banks to reduce loans and forces several of these basics to abandon rural zones. As a result, the banks' growth will be delayed. To stop the situation from worsening, banks might raise fees and other taxes dramatically. According to Barnor (2014), an unexpected shift in interest rate increases the default rate.

As per Khan and Sattar (2014), the interest rate has a positive or negative impact on NPLs, based on its movement. Savings are discouraged by a fall in depositor interest rates and a rise in spread. An increase in the depositor's interest rate has a negative impact on the investment. In comparison to other sectors, the banking sector is the most vulnerable to interest rate swings because the majority of bank earnings derives from the interest rate differentials that banks charge and repay to savers.

2.3.3 Inflation

Rates of inflation can affect the economy of a country substantially. For instance, during times of high inflation and increments, prices of goods will increase. Therefore, when inflation in an economy rises, the general cost of goods is likely to increase. This will subsequently affect how firms perform financially. Therefore, many investors who engage in sale of goods and services in the market usually include an allowance for inflation (Biller, 2007).

Higher rates of inflation will translate to prices being higher for consumers slowing down business and thus reduce firms' earnings. Prices that are high also trigger a regime that has higher interest rate (Hendry, 2016). According to Fama (1970), inflation is likely to be negatively associated with real economic activity, and as a result likely to be positively related to the level of NPLs. Thus, NPLs ought to be associated positively given anticipated inflation rate and interest rate at the short-term representing the International Fisher Effect (IFE).

2.3.4 Unemployment Rate

Suppose that the financial and labor markets are both in a steady state. Let's say there's a negative shock to labor demand, resulting in lower earnings and salaries and more unemployment, everything else being equal. Increased unemployment means lower disposable income for those impacted, and therefore increased probability of loan defaults and low demand for loans (Osoro & Ogeto, 2014).

Theory and empirical research both state that the level of NPLs is closely related to economic stature, including such variables as unemployment, GDP, inflation, remittances, capital supply, the interest rate and exchange rates. Non-performing

loans are affected by changes in economic fundamentals and their impact on future forecasts (Rehman, Sidek, &Fauziah, 2009).

2.4 Empirical Review

Local and global studies have determined the relation between mobile lending and NPLs, the objectives, methodology and findings of these prior studies have been discussed in this section.

2.4.1 Global Studies

Kajewski (2014) studied banking industry innovations, their benefits, obstacles, and advice for practice in Australia. "A descriptive research design was used in the study. From 38 commercial banks in Australia, secondary data was drawn and risk manuals and financial reports in order to create a better picture of industry risk. Autocorrelation techniques and regressions analysis were used to examine the information. The outcome showed that over time, banks have sought to make their services more accessible by investing in new technological platforms. The transactions volumes went up due to the improvements introduced with each transaction. He found that in the wake of innovation, financial institutions saw a reduction in the cost of doing business and more effective delivery of services to clients.

Wadhe and Saluja (2015) investigated the profitability of Indian banks from 2006 to 2014, focusing on the effects of electronic banking. Data pertaining to the commercial banks in India was used in the study. Multiple regression analysis was performed to determine how banking services and profitability are interconnected. E-banking was shown to be related to increased profitability for both private and public sector banks. This research showed that increasing the number of ATMs increases profitability.

While the connections were few, however, some might be established between the financial institutions' profit and the number of branches.

Kim et al. (2019) examined fifty four scholarly papers on the relationship among development, integration and mobile service in order to identify the critical questions and gaps in their study. Findings indicate that most of the examined literature addressed three main areas: mobile services, delivery and the environment. In the early phases of the research, the regions examined shown a prejudice to individual and institutional circumstances in the mobile banking services are being implemented, compared to real users' supply and demand and their social effect. The research techniques were selected additionally showing minimal variety and depth. This analysis enhances the knowledge of current publications on mobile financial service in regards to inclusiveness among emerging regions and identifies needs for further investigations.

Chinoda and Akande (2019) have examined Africa's mobile telephone distribution, economic development and financial inclusion. A Structural Equation Model examined mobile telephone diffusion, economic development and financial inclusion for thirty two countries in Africa between 2004 and 2016. Findings demonstrated inclusion affects economic development through mobile telephones. The implications of the study were in the management of the relevance of deploying mobile handsets for finance and growth in Africa.

From 2001 to 2014, Ghosh (2019) utilized data from key Indian states to evaluate the trinity of Mobile, Inclusion and Aadhaar on economic development. Research demonstrated that mobile proliferation has a statistically substantial effect on economic development using advanced panel data techniques. Furthermore,

significant complementarities have been identified connecting financial inclusion and mobile telephony. The extent to which financial use is complementary was much greater compared to accessibility. Furthermore, data demonstrated the increasing effect on inclusion of the biometric identification procedure (Aadhaar), mainly via better financial access.

2.4.2 Local Studies

Kinyua (2018) aimed to evaluate the impact on Kenya's banks' efficiency from online banking. A population of 42 Kenyan banks has been utilized. The natural record of the total value of online banking transactions was used to offer the predictor variable for this study. Efficiency, as measured by the total income ratio to total assets, was the research's dependent variables. For a five-year period, secondary data was collected yearly (January 2013 to December 2017). In the study, all of the variables had statistical significance. Internet banking and liquidity produced favorable results, whereas bank volume produced a negative result for this study. Capital adequacy was shown to be a non-statistically significant predictor of commercial bank efficiency in the study.

Using 42 banks in Kenya, Muli (2018) sought to establish how banks efficiency is impacted by electronic banking. Predictor variable was used to assess the value of banking transaction using mobile, internet, agency and ATMs as an electronic banking system. Efficiency was selected as the variable of research response. Between 2013 and 2017, secondary data was gathered culminating to five years period. The findings showed a favorable impact on mobile banking, ATMs, capital adequacy, liquidity and the sizes of banks. Internet banking and agency banking have been shown to be statistical insignificants for the efficiency of commercial banks.

Abdulkadir (2019) using secondary data from 35 Kenyan commercial banks sought to establish how financial performance is impacted by financial technology guided by descriptive design approach. The amount of transactions carried out via mobile banking and transactions done through online banking was the determination of financial technology. Data has been collected from 35 business banks. The size and ratios of capital adequacy of commercial banks were variables that were controlled during analysis. Descriptive research design for all Kenyan commercial banks was utilized in the study from which secondary data were gathered. Pearson's correlation was used to demonstrate a linear link among the variables. To ascertain the extent of the association, regression analyses were used. Results demonstrated that the financial performance was significantly affected by financial technologies.

Ogweno (2019) aimed at finding out how financial innovations influences financial performance of Kenyan licensed MFIs. The population of the research was 13 licensed MFIs as of December 31, 2018. Secondary data was collected for 5 years on a yearly basis (January 2014 to December 2018). A descriptive cross-sectional approach was used in this research, with a multiple linear regression model used to assess the connection between variables. The findings revealed that savings accounts, mortgage accounts, and inflation are all important factors to consider. The research found that agency banking, number of ATMs as well as capital adequacy have a statistically insignificant impact on financial performance of licensed MFIs.

Sindani, Muturi and Ngumi (2019) examined the impact of financial channels of distribution evolution on financial inclusion in in Kenya over a period of six years beginning from 2012 to 2017. The specific objectives guiding this study include; examine how internet banking affects financial inclusion in Kenya and to examine

how ATM banking affect financial inclusion in Kenya. Secondary data was collected for subsequent analysis. For analysis of the data collected, frequency tables, percentages and means were used to demonstrate the findings of this study. Use of descriptive statistics in this study was meant to present the category sets formed by this research. The mean, standard deviation and variance on the dependent and independent variables function was to describe the variables used for the study. The conclusion from this study is that internet banking has had a beneficial effect on Kenya's financial industry in Kenya because it promotes productivity and efficiency. Also, ATM banking has enhanced financial inclusion in Kenya.

2.5 Conceptual Framework

Figure 2.1 shows the predicted relation between the variables.

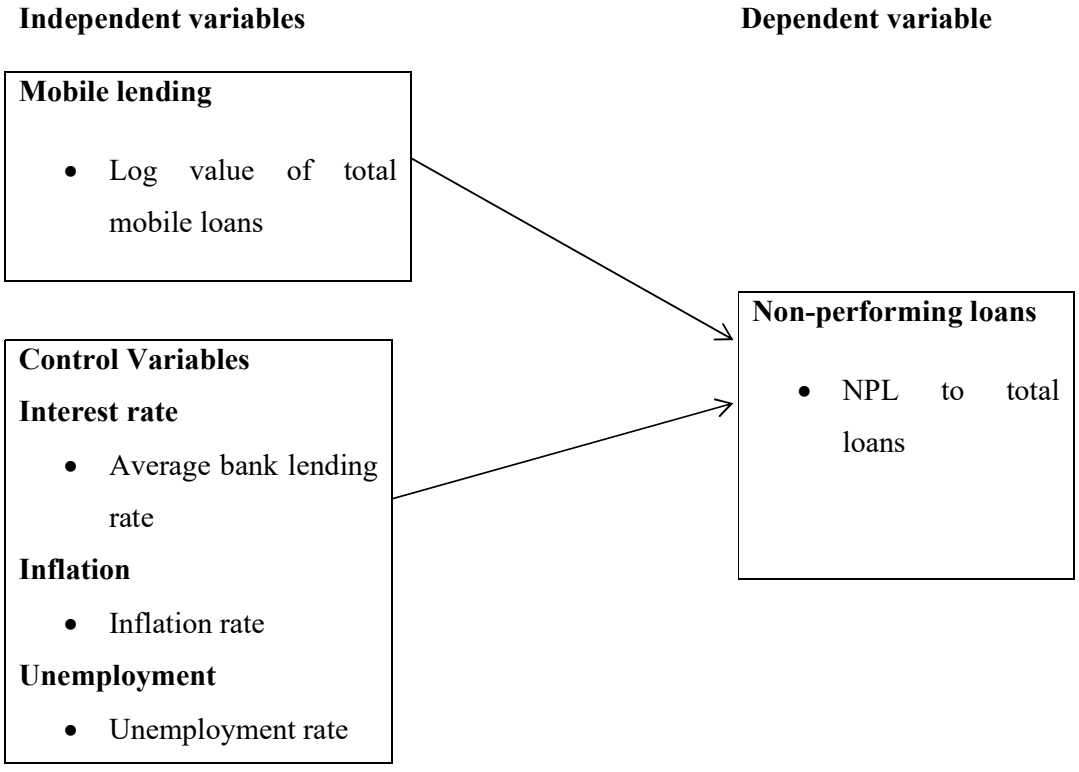

Figure 2.1: The Conceptual Model

Source: Researcher (2021)

The predictor variable was mobile lending given by the natural logarithm of the total value of mobile lending in a given quarter. The control variables were interest rate given by average bank lending rate, inflation given by quarterly inflation rate and unemployment given by quarterly unemployment rate. Non-performing loan was the response variable given by the NPLs to total loans and advances ratio.

2.6 Summary of the Literature Review and Research Gaps

The theoretical reviews showed the predicted relation between mobile lending and the level of NPLs in the banking sector. Major influencers of NPLs have been discussed. From the reviewed studies, there is a knowledge gap that needs to be filled. From the studies reviewed, there are varied conclusions regarding the relation between mobile lending and performance. The differences from the studies can be explained on the basis of different operationalization of mobile lending by different researchers thereby indicating that findings are dependent on operationalization model. Further, the prior studies have focused on the influence of mobile lending on performance leaving a gap on NPLs which was the focus of the current study.

Additionally, many studies done employed different designs for which some relied on empirical review to conclude while others relied on existing literature in measuring how the variables relate. Researchers showed varied inconclusive findings and failed to indicate the exact relationship that mobile lending has on the level of NPL. This shows the need for more research in future studies to close the gap by conceptualizing the effect of mobile lending on NPLs.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The chapter describes the approaches to be utilized in accomplishing the study objective which was to determine how mobile lending affects NPLs in the banking industry. In particular, the study highlights the; the design, data collection, as well as analysis.

3.2 Research Design

A descriptive design was adopted to determine how mobile lending and NPLs in the banking sector relate. This design was appropriate since the nature of the phenomena is of key interest to the researcher (Khan, 2008). It was also sufficient in defining the interrelationships of the phenomena. This design also validly and accurately represented the variables thereby giving sufficient responses to the study queries (Cooper & Schindler, 2008).

3.3 Data Collection

Data from the Kenyan Central Bank and KNBS was used in this study, which was secondary in nature on a quarterly basis spanning 10 years (2011-2020). CBK provided information on the dependent variable, level of NPLs and for each quarter, the ratio of NPL to total loans was collected. Data on mobile lending and average bank lending rate were also collected from CBK. KNBS provided inflation statistics on the quarterly inflation rate, and unemployment data on the quarterly unemployment rate.

3.4 Data Analysis

SPSS software version 24 was used to analyze the data. Tables and graphs presented

the findings quantitatively. Descriptive statistics were employed in the calculation of central tendency as well as dispersion measures and combined with standard deviation for every variable. Inferential statistics relied on correlation and regression. Correlation determined the magnitude of the relation between the study variables and a regression determined cause and effect among variables. A multivariate regression linearly determined the relation dependent and independent variables.

3.4.1 Diagnostic Tests

Before moving on to equation estimation, diagnostic tests were done to ensure that there are no breaches of the traditional linear regression model assumptions. Parameter estimations are skewed as well as inefficient whenever the assumptions of a classical regression model are broken.

3.4.1.1 Stationarity Test

Using Augmented Dickey-Fuller (ADF) tests, the researchers used a stationarity test to determine the presence of a unit root. The test being performed in regard to avoid the issue of erroneous and inconsistent regression results. In general, a p-value of below 5% indicating the null hypothesis of a unit root is rejected. The computed DF_T the calculated critical value was also compared to the statistic. The null hypothesis of a unit root was rejected since the DF_T statistic was more negative than the table value. It's worth noting that the lower the DF test statistic, the more evidence that the null hypothesis of a unit root was rejected.

3.4.1.2 Cointegration Test

Cointegration prior to the VAR analysis was carried out to see if the variables have a long-run or short-run correlation. The presence of cointegration was detected via the Johansen test in this study.

3.4.1.3 Normality Test

Jarque-Bera was used to establish the normality of the data, which was found to be true for all variables. The data was declared not normally distributed incase p-value obtained was below 0.05.

3.4.1.4 Multicollinearity

When two independent variables are linearly connected, this is a common occurrence in time series data. Its existence causes the variance of parameter estimations to inflate, resulting in inaccurate magnitude and sign estimates for the coefficients and signs. This could lead to erroneous findings. To test for multicolinearity, the researchers employed VIF values for all of the variables.

3.4.1.5 Autocorrelation

Autocorrelation relates to a circumstance in which the erroneous phrase is linked to the one before it. Its presence has no effect on the estimates' unbiasness, but it does lead to erroneous conclusions due to incorrect hypothesis testing. To see if there was any autocorrelation, the researchers used the Breusch Godfrey LM test. The residuals of the empirical model are not auto correlated if the p-values for the Chi-square statistic are below 0.05

3.4.2 Analytical Model

The following equation was applicable:

$$Y= \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where: Y = Non-performing loans given as the ratio of NPLs to total loans on a quarterly basis

β_0 =y regression equation intercept.

β_1, β_2, β_3, β_4=are coefficient of regression

X_1 = Mobile lending as measured by the natural logarithm of total mobile loans on an annual basis

X_2 = Interest rate as assessed via average bank lending rate on a quarterly basis

X_3 = Inflation as given by quarterly inflation rate

X_4 = Unemployment given by the quarterly unemployment rate

ε =error term

3.4.3 Tests of Significance

Parametric tests determined the general model and variable's significance. The F-test determined the model's relevance and this was achieved using ANOVA while a t-test determined the relevance of every variable.

CHAPTER FOUR: DATA ANALYSIS RESULTS AND FINDINGS

4.1 Introduction

This chapter deals with the analysis of data. The objective of the research was to establish the relationship between mobile lending and NPLs of the banking sector in Kenya. Patterns were studied by descriptive and inferential analysis, that were then analyzed and conclusions drawn on them, in accordance with the specific objectives.

4.2 Descriptive Statistics

The study sought to describe the data in terms of their mean and standard deviations. The descriptive analysis was necessary as it helps in understanding the characteristics of the collected data before conducting inferential analysis. The results are as shown in Table 4.1

Table 4.1: Descriptive Results

	N	Minimum	Maximum	Mean	Std. Deviation
NPLs	40	.096	.180	.14068	.023914
Mobile lending	40	6.615	7.336	6.97313	.226439
Interest rate	40	5.9	18.0	9.685	2.7149
Unemployment rate	40	2.600	2.980	2.78800	.112209
Inflation	40	4.1567	16.2900	7.186000	2.9059835
Valid N (listwise)	40				

Source: Research Findings (2021)

Table 4.1 shows the descriptive analysis in terms of the mean, standard deviation, minimum and maximum. The data was collected for 10 years on a quarterly basis giving 40 observations. The dependent variable was NPLs while the independent variable was mobile lending. Finally, the control variables were interest rate, inflation and unemployment rate.

4.3 Diagnostic Tests

Prior to running the regression model, diagnostics tests were performed. Co-integration, Multicollinearity, normality, autocorrelation, and stationarity test were all performed in this instance.

4.3.1 Stationarity Test

The researchers used a stationarity test to determine the presence of a unit root Augmented Dickey-Fuller (ADF) tests. The findings are as shown in Table 4.2.

Table 4.2: Stationarity Test

	Critical value at 95%	DFT statistic	P-value
NPLs	-2.629	-3.271	0.000
Mobile lending	-2.629	-3.337	0.000
Interest rate	-2.629	-4.748	0.000
Inflation	-2.629	-3.755	0.000
Unemployment rate	-2.629	-4.826	0.000

Source: Research Findings (2021)

From the conclusions, the p-values for all the variables were less than 0.05 and the DFT statistic were more negative than their corresponding critical values. This is an indication that null hypothesis that there is a unit root was rejected and study concluded that the variables did not have unit roots.

4.3.2 Co-integration Test

Co-integration test was conducted to determine whether the variables exhibit a long run or short run relationship. The results are as shown in Table 4.3

Table 4.3: Co-integration Test Results

	Eigen Value	Trace Statistic	Critical value at 95%	P-value
Mobile lending	0.123	23.13	26.03	0.000
Interest rate	0.083	61.02	62.07	0.000
Inflation	0.301	20.01	26.79	0.000
Unemployment rate	0.189	27.22	28.76	0.000

Source: Research Findings (2021)

From the conclusions, the study shows that all the variables had their p values less than 0.05 and hence the study concluded that variables exhibit long-run or short run relationship.

4.3.3 Normality Test

Data normality was tested using Jarque-Bera and was established for all variables. The findings are shown in Table 4.4.

Table 4.4: Normality Test Results

	Jarque-Bera Coefficient	P-value
NPL	2.587	0.100
Mobile lending	5.304	0.202
Interest rate	1.763	0.315
Inflation	2.153	0.227
Unemployment rate	3.145	0.201

Source: Research Findings (2021)

From the conclusions, the p-values for NPLs, mobile lending, interest rate, inflation and unemployment rate were greater than 0.05. Thus, the research resolved the data was deemed to be normally distributed.

4.3.4 Multicollinearity

Collinearity Statistics was used to see if the independent variables were sufficiently correlated to establish a significant causal correlation. The results for multicollinearity test were presented in Table 4.5

Table 4.5: Collinearity Statistics

	Collinearity Statistics	
	Tolerance	**VIF**
Mobile lending	.166	6.134
Interest rate	.103	8.998
Inflation	.138	7.217
Unemployment rate	.101	8.834

Source: Research Findings (2021)

Based on the coefficients output, mobile lending had a VIF value of 6.134, interest rate had a VIF value of 8.998, inflation had a VIF value of 7.217 while unemployment rate had a VIF value of 8.823. The VIF values for all the variables were less than 10 implying that there were no Multicollinearity symptoms.

4.3.5 Autocorrelation

Autocorrelation is a measure of how similar one time series was when compared to its lagged value across successive timings. The measure of this test was done using the Wooldridge test. The findings are shown in Table 4.6.

Table 4.6: Autocorrelation Results

Wooldridge test for autocorrelation **H0: no first-order autocorrelation**
F(1, 40) = 0.376
Prob> F = 0.5238

Source: Research Findings (2021)

From the results of Table 4.6, the null hypothesis of no serial correlation is not rejected given that the p-value is significant (p-value = 0.5238).

4.4 Correlation Results

Correlation analysis was carried out to establish the strength and direction of association between each predictor variable and the response variable. The results in Table 4.7 show the nature of relationships between the study variables in terms of magnitude and direction.

Table 4.7: Correlation Results

		NPLs	Mobile lending	Inflation	Unemployment rate	Interest rate
NPLs	Pearson Correlation	1				
	Sig. (2-tailed)					
Mobile lending	Pearson Correlation	.088	1			
	Sig. (2-tailed)	.588				
Inflation	Pearson Correlation	.490**	.043	1		
	Sig. (2-tailed)	.001	.560			
Unemployment rate	Pearson Correlation	.392*	-.003	-.034	1	
	Sig. (2-tailed)	.012	.972	.643		
Interest rate	Pearson Correlation	.343*	.095	-.048	-.106	1
	Sig. (2-tailed)	.030	.200	.520	.150	

*. Correlation is significant at the 0.05 level (2-tailed).
b. Listwise N=40

Source: Research Findings (2021)

The results in Table 4.7 reveal that mobile lending and NPLs are positively but not significantly correlated (r=0.088) at 5% significance level. This implies that mobile lending and NPLs change in the same direction but the association is not significant statistically. In addition, the results show that inflation and NPLs are positively and significantly correlated (r=0.490) at 5 % significance level. Further, results show that unemployment rate and NPLs are positively and significantly correlated (r=0.392) at 5

% significance level. Finally, interest rate and NPLs exhibited a positive association which was statistically significant (r=0.343) at 5 % significance level.

4.5 Regression Results

Regression analysis was carried out to establish the extent to which NPLs is explained by the selected variables. The regression results were presented in Table 4.8 to Table 4.10.

Table 4.8: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.783[a]	.613	.568	1.3322720

a. Predictors: (Constant), Interest rate, Inflation, Mobile lending, Unemployment rate

Source: Research Findings (2021)

From the findings as represented by the adjusted R^2, the independent variables that were studied explained 61.3% of the variations in NPLs among commercial banking sector in Kenya. This therefore means the four variables contributed 61.3% of the variations in NPLs among commercial banking sector in Kenya while other factors not studied in this research contribute 68.7%.

Table 4.9: ANOVA Analysis

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	98.235	4	24.559	13.836	.000[b]
	Residual	62.123	35	1.775		
	Total	160.358	39			

a. Dependent Variable: NPLs
b. Predictors: (Constant), Interest rate, Inflation, Mobile lending, Unemployment rate

Source: Research Findings (2021)

ANOVA statistics in Table 4.9 show that the data had a 0.000 level of significance hence this indicates that the data is ideal for making conclusions on the variables.

Table 4.10: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.812	.031		7.254	.000
	Mobile lending	.166	.127	.094	1.310	.192
	Inflation	.348	.149	.168	2.337	.021
	Unemployment rate	.767	.261	.706	5.647	.000
	Interest rate	.179	.270	.102	1.405	.162

a. Dependent Variable: NPLs

Source: Research Findings (2021)

The coefficient of regression model was as below;

$$\mathbf{Y = 0.812 + 0.348X_1 + 0.767X_2}$$

Where:

Y = NPLs; X_1 = Inflation; X_2= Unemployment rate

4.6 Discussion of Research Findings

The objective of this study was to establish the effect of mobile lending on NPLs. The study utilized a descriptive design. The study relied on secondary data which was obtained from CBK quarterly reports. Mobile lending was measured as the natural logarithm of value of total mobile loans in a given year. The control variables were inflation, unemployment rate and interest rates. Data was analyzed using both descriptive and inferential statistics. The results are discussed in this section.

The results of correlation analysis revealed that mobile lending did not have a significant association with NPLs among banking sector in Kenya. Although the association was positive, the magnitude was not significant. The results further revealed that inflation had a positive and significant association with NPLs which implies that when the inflation is increasing, the level of NPL is usually increasing. Unemployment rate exhibited a positive and significant association with NPLs

implying that an increase in unemployment rate tend to be associated with higher level of NPLs. The association between interest rate and unemployment rate was found to be positive but not statistically significant.

The regression results revealed that the four selected predictor variables explain 61.3% of changes in NPLs in the banking sector in Kenya. The explanatory power is also significant as the p value was 0.000 which is less than 0.05. This implies that the model was sufficient in describing the cause and effect among the study variables. Individually, mobile lending does not have a significant influence on NPLs while inflation has a significant positive effect. Unemployment rate was also found to have a significant positive influence on the level of NPLs while interest rate was not statistically significant.

These results concur with Kamande (2018) who investigated how electronic banking impacts Kenyan commercial banks' financial results. He obtained samples from all 42 commercial banks in Kenya. The value of transactions made via mobile banking, internet banking, agency banking, and ATMs was used as the predictor variable for electronic banking. The return on assets, that was selected as the research's response variable, was utilized to analyze financial performance. Over a five-year period, from January 2013 to December 2017, secondary data was collected. According to the findings, agency banking, ATMs, liquidity, unemployment rate, and inflation all had a significant positive impact. Mobile banking and internet banking were discovered to be statistically insignificant commercial bank financial performance determinants.

The results also concur with Chirah (2018) who sought to determine the alternative banking channels impact on commercial banks in Kenya operational efficiency. The population was drawn from a total of Kenyan 42 commercial banks. Alternative

banking platforms were the research's independent variable, as evaluated by the value of transactions made by mobile banking, internet banking, ATMs, and banking through agents. Operational efficiency, which was measured as the ratio of operating expenses to total revenue, was the response variable. Starting in January 2013 and ending in December 2017, secondary data was collected annually for a period of five years. In this research, the results show that liquidity has a positive and substantial value. As per the study, ATMs, agency banking, mobile banking, internet banking, company size, and capital structure are statistically negligible drivers of commercial bank operational effectiveness.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter reviews the results from the previous chapter, it further derives conclusions as wells as the limitations encountered during the study. In addition, it provides recommendation for policy makers and gives suggestions on areas where further studies can be done.

5.2 Summary of Findings

The objective of this research was to assess how mobile lending influences the level NPLs of banking sector in Kenya. The selected variables for investigation included mobile lending, inflation, unemployment rate and interest rates. A descriptive research design was selected to complete the research. Secondary data was gathered from CBK and an analysis made using SPSS. Quarterly data for 10 years from 2011 to 2020 was obtained from the CBK reports.

The first objective was to establish the effect of mobile lending on NPLs among banking sector in Kenya. The correlation results at 5 % significance level show that mobile lending had a positive correlation with NPLs. However, the association was not statistically significant. Regression results (β=0.166, p=0.192) show that there was a positive but not significant effect of mobile lending on the level of NPLs of the banking sector in Kenya.

The second objective was to assess the effect of inflation on NPLs among banking sector in Kenya. The correlation results at 5 % significance level show that inflation had a positive and significant correlation with NPLs. Regression results (β=0.348,

p=0.021) show that there was a positive and significant effect of inflation on NPLs of the banking sector in Kenya.

The third objective was to examine the effect of unemployment rate on NPLs among banking sector in Kenya. The correlation results at 5 % significance level show that unemployment rate had a positive correlation with NPLs. Regression results (β=0.767, p=0.000) show that there was a positive and significant effect of unemployment rate on NPLs of the banking sector in Kenya.

The fourth objective was to examine the effect of interest rates on NPLs among banking sector in Kenya. The correlation results at 5 % significance level show that interest rates had a positive but not significant association with NPLs. Regression results (β=0.379, p=0.162) show that there was a positive but not significant effect of interest rates on NPLs of the banking sector in Kenya.

5.3 Conclusions

The study purpose of the research was to find out the association between mobile lending and NPLs. The findings indicated that mobile lending had a positive but not significant effect on NPLs. This may imply that banking sector with high levels of mobile loans do not necessarily have high levels of NPLs.

The study results further indicated that inflation had a positive and significant effect on NPLs which might mean that a rise in inflation is likely to result to a rise in NPLs. This can be explained by the fact that high inflation rate leads to a rise in the cost of living making it difficult for households and businesses to meet their maturing obligations.

The study results showed that unemployment rate had a positive and significant effect on NPLs. This may mean that high proportion of unemployment rate can to lead to high levels of NPLs. This can be explained by the fact that loss of employment is one of the key reasons households default on their loans as their source of income that served as security is no longer available.

In addition, the results revealed that interest rate has no significant effect on NPLs. This implies that banks with higher interest rates do not always report more NPLs compared to banks with low interest rates. This can be explained by the fact that due to the determination of interest rate based on demand and supply, banks charge relatively the same levels of interest rates for loans with the same amount of risk.

5.4 Recommendations for Policy and Practice

The study finding reveals that mobile lending does not contribute to an increase in NPLs. The study therefore recommends that managers of commercial banks should keep offering mobile loans as this does not increase the risk of delinquent loans. Policy makers such as CBK should come up with policies and guidelines that would make it easy for banks to offer mobile loans to their clients.

The research showed that inflation impacts on Kenya's banking sector level of NPLs. The research suggests that commodity prices should be regulated on the market since price growth leads to inflation, which may have a negative effect on the growth of the economy. The research suggests that interest rates should be determined by the law of demand and supply with minimal regulation as they do not have a significant influence on economic growth.

The results of this research have shown that the unemployment rate has had a positive and substantial impact on the level of NPLs in the Kenyan banking sector. The study

recommends that steps are needed to guarantee that variables that impact existing unemployment levels are properly handled in order to ensure that the current unemployment rate does not negatively affect the level of NPLs. If the nation can control the current unemployment rate, this would improve productivity and eventually the development of the economy as a whole.

5.5 Limitations of the Study

The focus was on some of the elements that are thought to affect the NPLs of the banking sector in Kenya. The study focused on four explanatory variables in particular. However, there are other factors that are likely to influence a bank's NPLs. Some are controlled by the company, such as corporate governance and liquidity while others are outside the control of management such us exchange rates and economic growth.

The research used secondary quantitative data. The study also ignored qualitative data that could explain other factors that influence the relationship between mobile lending and bank's NPLs. Qualitative methods like focus groups, open-ended surveys, and interviews can aid in the development of more definite outcomes.

The study focused on a ten-year period (2011 to 2020). It's unclear whether the results will last for a longer period of time. It is also unclear whether similar results will be achieved after 2020. In order to account for key economic events, the study should have been conducted over a longer period of time.

The researchers utilized an OLS regression model to analyze the data. Because of the limitations of employing regression models, such as erroneous and deceptive outcomes that cause the value of the variable to change, it was not possible to

generalize the conclusions of the research with accuracy. More so the result could be different if more data was added in the regression.

5.6 Suggestions for Further Research

The study was not exhaustive of all factors affecting the level of NPLs. This implies that there are other factors that affect NPLs among the banks in Kenya that were not addressed by the research. Other researches ought thus to focus on other factors for example; corporate governance, liquidity, ownership structure, management efficiency among other factors that affect NPLs among banks.

The study was limited to the banking sector in Kenya. Additional research on other financial institutions such as microfinance banks and SACCOs should be conducted, according to the study's suggestions. Future research should look into how mobile lending affect other factors besides the NPLs, such as company value, efficiency, and dividend policy.

Because of the readily available data, the focus of this research was drawn to the last ten years. Future studies may span a longer time period, such as twenty or thirty years, and might have a significant impact on this study by either complementing or contradicting its conclusions. A longer study has the advantage of allowing the researcher to catch the effects of business cycles such as booms and recessions.

Finally, this research relied on a regression model, which has its own set of limitations, such as errors and misleading results when a variable is changed. Future study should concentrate on other models in order to investigate the various interrelationships between mobile lending and the level of NPLs.

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APPENDICES

Appendix I: Research Data

Year	Quarter	NPLs	Mobile lending	Interest rate	Unemployment rate	Inflation
2011	1	0.177	6.615	5.88	2.860	4.16
	2	0.162	6.633	6.25	2.860	6.01
	3	0.162	6.666	7.00	2.860	9.02
	4	0.114	6.665	15.16	2.860	12.78
2012	1	0.117	6.663	18.00	2.860	15.83
	2	0.144	6.685	18.00	2.860	16.29
	3	0.150	6.702	14.75	2.860	14.30
	4	0.135	6.726	11.00	2.860	10.70
2013	1	0.108	6.731	9.50	2.870	7.26
	2	0.141	6.755	8.50	2.870	5.04
	3	0.111	6.779	8.50	2.870	4.56
	4	0.096	6.796	8.50	2.870	5.39
2014	1	0.147	6.810	8.50	2.820	6.20
	2	0.177	6.828	8.50	2.820	6.83
	3	0.153	6.852	8.50	2.820	7.24
	4	0.129	6.858	8.50	2.820	6.98
2015	1	0.144	6.893	8.50	2.800	6.67
	2	0.150	6.922	8.50	2.800	6.66
	3	0.141	6.943	11.50	2.800	6.39
	4	0.159	6.963	11.50	2.800	6.44
2016	1	0.114	6.989	11.50	2.760	6.84
	2	0.114	7.018		2.760	6.59

Year	Quarter	NPLs	Mobile lending	Interest rate	Unemployment rate	Inflation
				10.50		
	3	0.132	7.039	10.50	2.760	6.47
	4	0.144	7.053	10.00	2.760	6.40
2017	1	0.162	7.075	10.00	2.690	6.48
	2	0.099	7.107	10.00	2.690	7.72
	3	0.096	7.126	10.00	2.690	8.32
	4	0.105	7.137	10.00	2.690	8.15
2018	1	0.156	7.159	10.00	2.640	7.36
	2	0.180	7.177	9.50	2.640	5.68
	3	0.159	7.187	9.00	2.640	4.70
	4	0.180	7.197	8.50	2.640	4.60
2019	1	0.144	7.208	8.50	2.600	4.67
	2	0.177	7.230	8.50	2.600	5.04
	3	0.144	7.255	8.50	2.600	5.32
	4	0.132	7.258	8.50	2.600	5.19
2020	1	0.132	7.269	7.75	2.980	5.62
	2	0.141	7.296	7.00	2.980	6.12
	3	0.163	7.324	7.00	2.980	5.89
	4	0.136	7.336	7.00	2.980	5.54