

**THE EFFECT OF CREDIT INFORMATION SHARING ON NON-PERFORMING
LOANS OF COMMERCIAL BANKS IN KENYA**

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DECLARATION

This research project is my original work and has not been presented in any other university.



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This research project has been submitted for presentation with our approval as the university supervisors.



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Prof. Cyrus Iraya

DEDICATION

I dedicate this research project to my parents, whose unwavering love, support, and sacrifices have been the driving force behind my academic journey. Their belief in my potential has been a constant inspiration. I also dedicate this work to my friends and mentors who have shared their wisdom and encouragement, shaping my intellectual growth.

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LIST OF ABBREVIATIONS

CA:	Capital Adequacy
CBK:	Central Bank of Kenya
CET:	Common Equity Tier
CRBs:	Credit Reference Bureaus
CRR:	Credit Reports Requested
CRS:	Credit Reports Shared
LIR:	Lending Interest Rate
LR:	Liquidity Ratio
NPLs:	Non-performing loans
SACCOs:	Savings and Credit Cooperative Societies

ABSTRACT

Commercial banks in Kenya have been using information from Credit Reference Bureaus (CRBs) to make lending decisions. However, despite the use of credit information sharing among commercial banks, non-performing loans still remain a challenge. This is shown by the increasing non-performing loans ratio. The objective of the study was to determine the effect of credit information sharing on the non-performing loans among Kenyan commercial banks. The study adopted an explanatory research design. The target population was therefore all the 39 commercial banks in Kenya that are currently operational. Census survey was used. This research study made use of secondary panel data. In this study, secondary data was obtained from the annual reports of individual commercial banks as well as the Central Bank of Kenya. The data was collected by use of a data collection checklist. Data gathered using a checklist was in panel form as it comprised of 39 commercial banks. Both descriptive and inferential statistics was used in the analysis of data with the help of statistical software known as STATA version 14. Descriptive statistics included mean, percentages, frequency distributions and also standard deviation. Inferential statistics included correlation analysis and regression analysis. The study found that credit information sharing has a significant effect on the non-performing loans among Kenyan commercial banks. Specifically, the study found that credit reports shared and credit reports shared have a negative and significant effect on the non-performing loans among Kenyan commercial banks. The study revealed that capital adequacy has a negative and significant effect on the non-performing loans among Kenyan commercial banks. However, the study found that lending interest rate, liquidity ratio and credit growth has no significant effect on non-performing loans for commercial banks in Kenya. The management of financial institutions should use the information obtained through credit reports to make informed lending decisions. This includes assessing the credit risk of potential borrowers and tailoring lending terms based on their credit history. By promoting responsible lending practices, banks can minimize the likelihood of non-performing loans. The study also recommends the management of the banks should provide continuous training to banking staff on the importance of credit information sharing and how to interpret credit reports. Policies should facilitate the sharing of accurate and comprehensive credit information among financial institutions, ensuring that the regulatory framework is conducive to responsible credit reporting. Policymakers should develop and enforce policies that ensure customer consent for the sharing of their credit information.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Globally, credit information plays a key role in addressing the issue of non-performing loans. A credit information sharing system provides commercial banks with access to comprehensive credit data on borrowers, including their credit history, outstanding loans, and repayment behaviour (Saada, 2018). By having access to borrowers' credit information, commercial banks can identify potential risks and determine if a borrower has a higher probability of default. This helps reduce the likelihood of granting loans to individuals or businesses with a higher risk of becoming non-performing. In addition, effective credit information sharing promotes better risk management practices by allowing banks to monitor and track the credit behaviour of borrowers more efficiently (Pauline & Nadham, 2022).

This study was anchored on the information asymmetry theory, moral hazard theory and credit rationing theory. According to the Information asymmetry theory, the Information asymmetry between lenders and borrowers is a significant concern, but credit information sharing helps in the provision of important information about the borrowers (Adusei & Adeleye, 2022). The moral hazard theory indicates that moral hazard is a problem associated with the buyer's inability to observe actions taken by the seller. Credit Rationing Theory indicates that in certain situations, lenders may limit the amount of credit they provide to borrowers, even if there is a demand for more credit at the prevailing interest rate (Anjawi & Makokha, 2019).

Commercial banks in Kenya have been experiencing an increase in non-performing loans over the years. In response, they have adopted credit information sharing as a way of improving lending decisions and reducing non-performing loans. Credit information sharing

in Kenya is facilitated by credit reference bureaus (CRBs) regulated by the Central Bank of Kenya (CBK) under the Credit Reference Bureau Regulations. The main purpose of credit information sharing is to promote responsible lending and borrowing practices, enhance risk assessment, and reduce the incidence of non-performing loans.

1.1.1 Credit Information Sharing

Credit information sharing refers to the practice of exchanging credit-related information among financial institutions, credit bureaus, and other relevant entities (Saada, 2018). It involves sharing data about borrowers' creditworthiness, payment history, outstanding debts, and other relevant information to make informed lending decisions and assess credit risk. According to World Bank (2019), credit information sharing is the exchange of information about borrowers' creditworthiness among lenders to facilitate more accurate and timely lending decisions, enhance risk management, and reduce credit risk. In addition, Agyei-Mensah and Addai (2019) defined credit information sharing as the practice where banks and other financial institutions exchange credit-related information about borrowers.

Various studies have conceptualized credit information sharing in different ways. In a study conducted in China, Nguyen and Elgammal (2022) looked at credit information sharing in terms of coverage of information sharing and number of reports sent to financial institutions. In a study conducted in developing countries, Adusei and Adeleye (2022) conceptualized credit information sharing in terms of number of credit reports shared and creditor rights protection. In Rwanda, Segihanga (2022) conceptualized credit information sharing in terms of credit risk assessment and collateral information sharing. In Kenya, Anjawo and Makokha (2019) conceptualized credit information sharing in terms of credit rating, credit default cost and administration cost. In addition, Omukoko (2016) conceptualized credit information

sharing, in terms of repayment period, instalment amounts, amount of credit given and number of credit reports generated.

1.1.2 Non-Performing Loans

Non-performing loans (NPLs) refer to loans that borrowers are not making payments on as per the agreed terms and conditions. Saada (2018) indicates that a non-performing loan (NPL) is a loan where the borrower is in default or where the financial institution considers that the full repayment of the loan is unlikely. According to Ghosh (2017), non-performing loans are loans for which the principal or interest payments are past due by 90 days or more, or loans in respect of which it is assessed that the full repayment of principal and interest is unlikely. In all the definitions of non-performing loans, the key criterion for a loan to be classified as non-performing is the delay or failure of the borrower to make payments in accordance with the agreed terms. NPLs are a concern for financial institutions as they indicate credit risk and can have implications for the institution's profitability, capital adequacy, and overall financial stability.

Different studies conducted around the world have measured non-performing loans in different ways. Hoang, Nguyen and Elgammal (2022) measured nonperforming loans in the banking sector in terms of nonperforming loans ratio. In addition, Segihanga (2022) measured the performance of loans in the banking sector in Rwanda in terms of default rates and non-performing loans ratio. In a study conducted in developing countries, Adusei and Adeleye (2022) measured non-performing loans in terms of non-performing loans ratio. In Kenya, Kabui (2016) measured non-performing loans in commercial banks in terms of a ratio of loans in default for more than 90 days to the total loans and advances. In another study, Zahra (2022) measured nonperforming loans in commercial banks in Kenya using the ratio of non-performing loans to total loans.

1.1.3 Relationship between Credit Information Sharing and Non-Performing Loans

The relationship between credit information sharing and non-performing loans (NPLs) is a complex and multifaceted one, as it involves various financial and economic factors (Agyei-Boapeah, Fosu & Ntim, 2019). Credit information sharing involves the practice of financial institutions and credit bureaus exchanging information about borrowers' credit histories, including their payment behavior, outstanding debts, and credit utilization (Adusei & Adeleye, 2022). Credit information sharing can have a significant impact on the management of NPLs. When financial institutions share comprehensive credit data, they gain a better understanding of the creditworthiness and risk profile of their borrowers.

Credit information sharing enables lenders to assess the credit risk associated with potential borrowers more accurately. By evaluating an applicant's credit history, lenders can make more informed decisions about whether to extend credit and at what terms (Segihanga, 2022). In addition, when lenders have access to credit histories, borrowers with poor credit records may find it more challenging to obtain loans. This discourages high-risk individuals from borrowing, reducing the likelihood of NPLs. Further, credit information sharing allows lenders to monitor existing borrowers' credit behavior (Pauline & Nadham, 2022). Also, borrowers with positive credit histories and lower credit risks may be offered loans at more favorable interest rates (Mugwe & Oliweny, 2020). In addition, the knowledge that credit behavior is being tracked and reported can act as a deterrent against delinquency or default for some borrowers, further reducing NPLs.

1.1.4 Commercial Banks in Kenya

Commercial banks play a vital role in the Kenyan economy and contribute significantly to its development. They act as financial intermediaries by matching borrowers and savers. Commercial banks in Kenya are regulated by various Acts, which include The Central Bank

of Kenya Act, Companies Act and The Banking Act among other guidelines used by the Central Bank of Kenya. By the year 2022, there were 42 commercial banks in Kenya. Nevertheless, among these banks, Chase Bank (K) Limited together with Imperial Bank Limited are currently under receivership. In addition, Charterhouse Bank Limited is currently under statutory management (Central Bank of Kenya, 2022).

Commercial banks in Kenya provide credit facilities to individuals, businesses, and other entities (Central Bank of Kenya, 2022). They offer business loans, personal loans, mortgages, overdraft facilities, trade finance, credit cards, revolving funds among others. Non-performing loans (NPLs) have been a challenge for commercial banks in Kenya. These loans can have a negative impact on the financial health of banks. The Central Bank of Kenya (CBK) monitors and regulates the banking sector in Kenya and has implemented various measures to address the issue of non-performing loans. These measures include guidelines on loan classification and provisioning, stricter loan monitoring, and enhanced risk management practices. However, despite the use of various strategies to reduce non-performing loans in Kenya they are still increasing.

1.2 Research Problem

Globally, there is a widespread adoption of credit information sharing among commercial banks. Credit information sharing systems, such as credit bureaus, provide banks with access to comprehensive and reliable information on borrowers' credit histories, including their outstanding loans, repayment patterns, and creditworthiness (Hoang, Nguyen & Elgammal, 2022). This enables banks to make more informed lending decisions and assess the creditworthiness of potential borrowers more accurately. Segihanga (2022) and Pauline and Nadham (2022) observed that credit information sharing led to an improvement in bank' loans performance and a reduction in non-performing loans. However, Muigai and Mwangi

(2022), Zahra (2022) and Kabui (2016) found that credit information sharing had no statistically significant effect on loan performance in the Kenyan Banking Sector.

Commercial banks in Kenya have been using information from Credit Reference Bureaus (CRBs) to make lending decisions. In Kenya, credit information sharing enables lenders to evaluate borrowers based on their creditworthiness rather than solely relying on traditional forms of collateral. However, despite the use of credit information sharing among commercial banks, non-performing loans still remain a challenge. For instance, the ratio of gross non-performing loans to gross loans increased from 12.5 percent in December 2019 to 14.5 percent in December 2020, although decreased slightly to 14.1 percent in December 2021 (Central Bank of Kenya, 2022).

Various studies have been conducted around the world on credit information sharing and non-performing loans. Agyei-Boapeah, Fosu and Ntim (2019) examined the relationship between credit information sharing and loan default in 87 developing countries and found that there was a relationship between credit information sharing and loan default rate is conditional on banking market concentration. In addition, Segihanga (2022) conducted a study on the effect of credit information sharing on bank' loans performance in Rwanda and found that credit information sharing had a significant effect on loan performance in commercial banks on Rwanda. Further, Adusei and Adeleye (2022) examined the relationship between credit information sharing and non-performing loans across 132 countries and established that credit information sharing had a negative effect on non-performing loans. However, different countries are governed by different regulatory frameworks governing credit information sharing and hence the findings of these studies cannot be generalized to commercial banks in Kenya.

In Kenya, Omukoko (2016) examined the effect of credit information sharing on non-performing loans of commercial banks in Kenya and found that credit information sharing had a significant effect on non-performing loans of commercial banks. In addition, Mburu (2016) studied the effect of credit information sharing on curbing non-performing loans in selected commercial banks in Nairobi, Kenya and found that credit information sharing enabled borrowers' profiling for lending decisions by the banks. Further, Zahra (2022) studied the effect of credit information sharing on non-performing loans of commercial banks in Kenya and revealed that there was no significant relationship between credit information sharing and non-performing loans. Also, Muigai and Mwangi (2022) examined the effect of credit information sharing on loan performance in the Kenyan Banking Sector and established that credit information sharing had no statistically significant effect on loan performance in the Kenyan Banking Sector.

However, Omukoko (2016), Mburu (2016), Muigai and Mwangi (2022) and Zahra (2022) utilized a descriptive research design. In addition, Omukoko (2016) focused on the period between 2006 and 2016 while Zahra (2022) covered the period between 2002 and 2016. Nonetheless, there have been significant changes in the banking sector since 2016. For instance, interest rate capping was introduced in September 2016 and removed in 2019. In addition, Mburu (2016) and Muigai and Mwangi (2022) made use of primary data which was collected by use of questionnaires. To cover these gaps, this research sought to answer the question: what is the effect of credit information sharing on the non-performing loans among Kenyan commercial banks?

1.3 Research Objective

The objective of the study was to determine the effect of credit information sharing on the non-performing loans among Kenyan commercial banks.

1.4 Value of the Study

The study may be of great importance to the management of commercial banks in Kenya, the government and policy makers as well as other researchers and academicians. To the management of commercial banks in Kenya, the study provides evidence on whether enhanced information sharing leads to a reduction in NPLs or improves credit quality. This information can assist the bank's management in developing effective risk management strategies and policies. The findings also inform the management of commercial banks in refining their lending practices and criteria, considering the availability of shared credit information to make better-informed decisions about loan approvals, interest rates and credit limits.

To the government of Kenya and policy makers, the findings of the study help in evaluating the effectiveness of existing policies and initiatives. It will provide information on whether credit information sharing policies have achieved their intended objectives, such as reducing NPLs or improving credit quality. Policymakers can use the findings to assess the impact of current policies and identify areas for improvement or refinement.

The study adds more information to the body of knowledge on credit information sharing and non-performing loans in commercial banks in Kenya. To other researchers and academicians, the study provides information that they can use as research material and in the identification of research gaps. The study also forms a basis upon which further studies can be conducted on credit information sharing and non-performing loans in financial institutions in Kenya.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter sets out a review of related literature regarding credit information sharing and the non-performing loans. It covers a theoretical review, relationship between information sharing and non-performing loans as well as empirical review of literature, summary and knowledge gaps and conceptual framework.

2.2 Theoretical Review

A theory is a well-substantiated explanation or framework that explains a set of phenomena or observations (Kumar, 2019). It is a coherent and organized system of ideas or principles that are supported by evidence and can be used to predict and explain various aspects of the natural world or a specific domain of knowledge. The study was anchored on information asymmetry theory, moral hazard theory and credit rationing theory.

2.2.1 Information Asymmetry Theory

This theory was developed by Michael Spence, George Akerlof, and Joseph Stiglitz. In the years 2001, the three proponents of the theory won a Nobel Prize for their excellent contribution in economics. In the years 1970, Akerlof was the first person to write on information asymmetry on his book "The Market for 'Lemons'". In this book, the author argued that the information seen by the car buyers is very different from the information possessed by the car sellers; this presents an incentive for the sellers to find customers for their goods which are of less market quality (Khlifi, 2022). In the years 1973, this information was enriched by Michael Spence who wrote a book on "Job Market Signalling." In his book, he argued that staff are uncertain investments for the organizations. This implies that when an employer is hiring new staff he/she is taking a risk since he has no information

on the level of productivity of the employee. This act of employers taking risk was compared to a lottery. According to Spence, there is information asymmetry between employers and the staff which brings up scenarios whereby a persistent equilibrium trap is created by low-paying jobs. This trap does not in any way encourage the bidding up of salaries in various markets. Through Stiglitz, information asymmetry has been facilitated to reach mainstream acclaim. Market screening theory was used to in co-authoring several papers which included very essential work of information asymmetry in both banking sector and insurance sector (Brennan, Kirwan & Redmond, 2016).

Information asymmetry occurs when one party possesses information that is not available to the other party. This hidden or private information can include details about product quality, risks, costs, or other relevant factors (Khlifi, 2022). In addition to hidden information, information asymmetry theory also considers situations where one party can take actions that are not observable or verifiable by the other party. These hidden actions can lead to moral hazard problems, where the party with more information may act in a way that is detrimental to the other party (Nurunnabi, 2021). This imbalance of information can arise in various situations, such as when buyers and sellers have different levels of knowledge about product quality, service reliability, or market conditions. It emphasizes the importance of transparency, mechanisms to reduce information asymmetry, and policy interventions to enhance market efficiency and welfare.

This study made use of information asymmetry theory to explain the relationship between credit information sharing and non-performing loans. Information Asymmetry Theory is highly relevant in the context of credit information sharing and its impact on non-performing loans (NPLs). In the field of finance and banking, information asymmetry between lenders and borrowers is a significant concern as it can lead to adverse selection and moral hazard problems, ultimately affecting the quality of loan portfolios. Credit information sharing refers

to the practice of sharing borrowers' credit-related information among lenders or credit bureaus. By sharing such information, lenders gain access to a more comprehensive and accurate view of borrowers' creditworthiness and payment histories. This improved information environment aims to mitigate information asymmetry and its negative effects on lending decisions.

2.2.2 Moral hazard theory

The moral hazard theory was developed by an Economist Paul Krugman who described moral hazard is the problem associated with the buyer's inability to observe actions taken by the seller (Mili & Abid, 2017). As observed by Owusu-Manu, Ofori-Yeboah and Edwards (2022) indicated that it is impossible for the buyer of services to evaluate whether the seller's actions were proper and adequate because it is difficult to judge the service quality, the service is irreversible and service outcome is uncertain because of exogenous factors. The difference between moral hazard and adverse selection is that adverse selection takes place before the transaction because one party has inadequate information regarding the other party's characteristics (Kiriazidis, 2019). On the other hand, moral hazard ensues after the transaction has taken place because the borrower or the buyer may engage in activities that are undesirable and unknown to the lender.

The study made use of the moral hazard theory to explain the effect of credit information sharing and the non-performing loans of commercial banks. Commercial banks face both adverse selection or moral hazard problems in its lending activity. Moral hazard theory plays a significant role in understanding the potential risks and challenges associated with lending activities. The theory suggests that when borrowers are insulated from the negative consequences of their actions, they may engage in riskier behavior, ultimately increasing the likelihood of default (Mili & Abid, 2017). This can create challenges for commercial banks in

managing their credit portfolios. Here are a few key considerations related to moral hazard theory in credit management.

Moral hazard theory highlights the importance of thorough loan underwriting practices. Commercial banks need to assess the creditworthiness of borrowers accurately and ensure that they have a genuine willingness and ability to repay the loans. Failure to properly evaluate borrowers' financial positions, collateral, and repayment capacity can lead to moral hazard, as borrowers may take on excessive debt knowing that the consequences of default will be mitigated (Kiriazidis, 2019). Once loans are disbursed, commercial banks must actively monitor borrower behaviour and financial performance, which can be obtained from credit information sharing. Regular monitoring helps detect any signs of moral hazard, such as a borrower's tendency to engage in high-risk activities or divert loan funds for unintended purposes. Effective loan monitoring enables banks to take corrective actions promptly and mitigate potential losses.

2.2.3 Credit Rationing Theory

Credit rationing theory was developed by Joseph Stiglitz and Andrew Weiss in the 1981. The theory refers to a situation where lenders are unwilling to advance additional funds to a borrower even at a higher interest rate (Jia, Heidhues & Zeller, 2010). The theory involves examining the phenomenon where borrowers, particularly those with higher credit risks, are unable to obtain the desired amount of credit from lenders. It suggests that in certain situations, lenders may limit the amount of credit they provide to borrowers, even if there is a demand for more credit at the prevailing interest rate.

Credit rationing arises due to information asymmetry between borrowers and lenders. Lenders may not have perfect knowledge of a borrower's creditworthiness or the true risk associated with lending to them (Kundid & Ercegovac, 2011). This information gap creates

uncertainty and increases the likelihood of credit rationing. When borrowers have limited liability or when lenders believe that borrowers will engage in riskier behaviour once they obtain credit, lenders may ration credit to control moral hazard risks (Lee & Kao, 2017). Lenders want to ensure that borrowers have a sufficient stake in the outcome of their borrowing decisions and are incentivized to use the funds responsibly.

The study used the credit rationing theory to explain the effect of credit information sharing on non-performing loans. Credit rationing theory can provide insights into the effect of credit information sharing on non-performing loans (NPLs). When lenders have access to comprehensive and accurate credit information, they can make more informed lending decisions. Credit information sharing facilitates ongoing monitoring of borrowers' credit activities. Lenders can detect early warning signs of financial distress, such as increasing debt levels or missed payments, through shared credit information. This allows lenders to take timely actions, such as adjusting credit limits, renegotiating terms, or initiating debt recovery processes.

2.3 Determinants of NPLs

This section presents determinants of non-performing loans which include capital adequacy, lending interest rate, liquidity ratio and credit growth.

2.3.1 Capital Adequacy

Capital adequacy is the level of capital that banks are required to hold as a cushion against potential losses. It is typically measured using regulatory capital ratios, such as the Basel III standards, which include common equity tier 1 (CET1) capital as a percentage of risk-weighted assets. Higher capital adequacy indicates that a bank has a larger capital buffer to absorb unexpected losses. In a study conducted on bank-specific factors affecting non-performing loans among commercial banks in G20 countries, Erdas and Ezanoglu (2022)

found that capital adequacy had a negative effect on non-performing loans. Khan, Siddique and Sarwar (2020) observed that capital adequacy has a significant negative effect on non-performing loans in commercial banks in developing countries. This was supported by Khoirunisa and Karnasi (2023) findings that capital adequacy has a significant negative effect on non-performing loans among commercial banks listed in Indonesia Stock Exchange.

2.3.2 Lending Interest Rate

Lending interest rates are the rates at which financial institutions, such as banks or credit unions, provide loans to borrowers. Among commercial banks listed in Indonesia Stock Exchange, Khoirunisa and Karnasi (2023) assessed factors influencing non-performing loans. Lending interest rate was one of the factors significantly influencing non-performing loans. Revina (2020) observed that when lending interest rates are high, it becomes more expensive for borrowers to access credit. This leads to decreased borrowing activity, and some borrowers who may have otherwise been able to manage their loans at lower rates may default on their loans due to the increased cost. In Ethiopia, Asfaw and Bogale (2018) found higher interest rates can contribute to an increase in NPLs.

2.3.3 Liquidity Ratio

Liquidity ratios are financial metrics used by businesses, financial analysts, and investors to assess a company's ability to meet its short-term financial obligations and cover its immediate cash needs. These ratios provide insights into a company's liquidity and its ability to convert assets into cash quickly. Uma and Naail (2019) observed that liquidity has a negative effect on non-performing loans in commercial banks. Banks with sufficient liquidity are better positioned to meet their short-term obligations and unexpected cash needs. This liquidity cushion can serve as a buffer against economic downturns or unexpected events that could otherwise lead to loan defaults. Waqas et al. (2019) established that Liquidity ratios can

influence a bank's risk appetite and lending practices. Banks with excess liquidity may be more inclined to extend loans to riskier borrowers or engage in lending activities that carry higher default risks. Conversely, banks with lower liquidity may be more cautious and selective in their lending, which can reduce the likelihood of NPLs. However, according to Khoirunisa and Karnasi (2023) liquidity ratio has no significant effect on non-performing loans among commercial banks listed in Indonesia Stock Exchange.

2.3.4 Credit Growth

Credit growth specifically refers to the expansion of a bank's loan portfolio and its overall lending activities (Asfaw & Bogale, 2018). Credit growth is a fundamental aspect of a bank's operations, and it has several implications and considerations for both the bank itself and the broader financial system. Credit growth for a bank involves increasing the size and diversity of its loan portfolio. Erdas and Ezanoglu (2022) found that credit growth had a positive effect on non-performing loans of commercial banks among commercial banks in G20 countries. In addition, Mosharrof and Nazim (2020) observed that one of the bank-specific factors affecting non-performing loans in Bangladesh is credit growth.

2.4 An Empirical Review

Various studies have been conducted around the world on credit information sharing and non-performing loans. Adusei and Adeleye (2022) examined the relationship between credit information sharing and non-performing loans across 132 countries around the world. The study used a systematic review of literature and found that credit information sharing had a significant effect on non-performing loans (NPLs). The findings also indicated that there is complementary effect of credit information sharing and creditor rights protection on NPLs in the study countries.

In 87 developing countries, Agyei-Boapeah, Fosu and Ntim (2019) examined the relationship between credit information sharing and loan default. Using a large dataset covering 879 unique banks from 87 developing countries from every continent, over a nine-year period, the study found that credit information sharing reduces loan default rate. In addition, the results indicated that the relationship between credit information sharing and loan default rate is conditional on banking market concentration.

In China, Hoang, Nguyen and Elgammal (2022) examined the effect of Credit information sharing on nonperforming loans of the banking system. The study made use of a descriptive research design and covered the period between 2004 and 2017. The findings indicated that credit information sharing has impact on nonperforming loans of banking system. The study found a negative association between bad debt levels and credit information sharing, suggesting that information sharing tends to enhance the financial sustainability of the banking sector. The findings also indicated that information sharing decreases the nonperforming loans.

Segihanga (2022) conducted a study on the effect of credit information sharing on bank' loans performance in Rwanda's Banking Sector. The study adopted a survey research design and mixed methods research design. The target population of the study 15 licensed commercial banks in Kenya. Both primary and secondary data was collected. The findings indicated that credit information sharing had a significant effect on loan performance in commercial banks on Rwanda. The findings indicated that credit information sharing plays a vital role in assessing and monitoring loan performance. By sharing credit-related information among lenders, credit bureaus, and other relevant entities, loan performance can be evaluated more effectively.

In Tanzania, Mwanza Region, Pauline and Nadham (2022) studied the effect of credit information bureau and appraisal methods on performance of commercial banks. The study adopted a descriptive research design, sampling 105 respondents randomly and purposefully and collected data through questionnaires. The findings revealed that credit information bureau had a positive, strong effect on the credit performance of commercial banks, and this effect is significant in Mwanza region. Non-performing loans had a positive, weak effect on the credit performance of commercial bank and it was not significant.

In Ghana, Bamfo (2016) studied the effect of credit information sharing schemes matter on bank profitability. A Fixed Effects regression model was used on unbalanced panel data from the Bank Scope Database. The results indicated that banks were profitable when there is voluntary credit information sharing through the Private Credit Bureaus, while compulsory credit information exchanges through Public credit Registries used as government antitrust policy mechanism which fosters competition has an insignificant impact on the profitability of banks. The study further shows that the extent of credit information sharing does not significantly support bank profitability as the depth of credit information sharing is low.

Mugwe and Oliweny (2020) examined the effect of credit information sharing on the performance of commercial banks in Kenya. The study adopted a correlational research design and the target population was all the 43 commercial banks in Kenya. The study used secondary data covering the period between 2005 and 2009. The findings of the study indicated that credit information sharing had a significant effect on the performance of commercial banks measured in terms of profit before tax, return on assets, return on equity and net profit margin.

Anjawo and Makokha (2019) examined the effects of credit information sharing on performance of savings and credit cooperative societies in Kenya. The study made use of a

descriptive survey research design. The target population comprised of SACCOs in Nairobi County. Primary data was collected from credit managers by use of questionnaires. The findings of the study indicated that credit information sharing in terms of credit rating had a significant effect on the performance of savings and credit cooperative societies in Kenya. Credit information sharing allows SACCOs to access comprehensive and up-to-date credit histories of potential borrowers. This information enables better risk assessment and creditworthiness evaluation, leading to improved lending decisions. SACCOs can identify high-risk borrowers and reduce the likelihood of default, ultimately minimizing credit losses.

Mburu (2016) studied the effect of credit information sharing on curbing non-performing loans in selected commercial banks in Nairobi, Kenya. The study adopted a descriptive research design and the target population was 43 registered commercial banks in Nairobi County. Primary data was collected by use of questionnaires from staff working in credit departments of the selected commercial banks. The results indicated that credit information sharing enabled borrowers' profiling for lending decisions by the banks. The credit evaluation methods were found to be effective in mitigating banks' credit default while credit scoring enabling the banks to ascertain loan delinquency and act appropriately. The influence of CRBs managerial capacity and infrastructure to manage information supplied by the commercial banks was not significant.

Muigai and Mwangi (2022) examined the effect of credit information sharing on loan performance in the Kenyan Banking Sector. The study adopted a descriptive research design and the target population was 39 commercial banks in Kenya. The study sampled 21 commercial banks and primary data was collected by use of questionnaires. The findings of the study indicated that credit information sharing had no statistically significant effect on loan performance in the Kenyan Banking Sector.

Zahra (2022) studied the effect of credit information sharing on non-performing loans of commercial banks in Kenya. The study compared credit information sharing with non-performing loans ratio 7 years before and 7 years after adoption credit information sharing in Kenya. The study adopted a descriptive research design and the target population comprised of 43 commercial banks in Kenya. The study utilized secondary data and an event study methodology. The findings indicated that there was no significant relationship between credit information sharing and non-performing loans.

Kabui (2016) studied the effect of credit reference bureaus on non-performing loans: a survey of commercial banks in Kenya. The study used a longitudinal research design and the target population included all the 43 licensed Commercial Banks in Kenya. Secondary data was used in the study. Data was collected from the annual Central Bank of Kenya reports between 2005 and 2014. The findings indicated that there is no significant relationship between Credit Information Sharing and Non-Performing Loans. Although, the Non-Performing Loans and Credit Information Sharing were highly correlated and inversely proportional, the correlation was not significant.

2.5 Summary and Knowledge Gaps

This research study was guided by the information asymmetry theory, moral hazard theory and credit rationing theory. Information asymmetry theory explores situations where one party in a transaction possesses more or better information than the other party. Information asymmetry between lenders and borrowers is a significant concern as it can lead to adverse selection and moral hazard problems, ultimately affecting the quality of loan portfolios. The moral hazard theory indicates that moral hazard is a problem associated with the buyer's inability to observe actions taken by the seller. It highlights the importance of thorough loan underwriting practices and loan monitoring among commercial banks. Credit Rationing

Theory indicates that in certain situations, lenders may limit the amount of credit they provide to borrowers, even if there is a demand for more credit at the prevailing interest rate. Empirical literature shows that credit information sharing has an effect on non-performing loans. Nonetheless, studies conducted on credit information sharing and non-performing loans have been limited to specific countries. Different countries around the world are characterized by different economic, legal and business environments and hence findings from one country are not generalizable to another. In addition, studies conducted in Kenya show mixed findings, with some studies showing positive relationship between credit information sharing and non-performing loans and other showing negative or insignificant effect.

2.65 Conceptual Framework

Figure 2.1 shows the diagrammatic representations of the relationship between the independent variable and the dependent variable. The independent variables were credit information sharing while the dependent variable was non-performing loans. The control variables were capital adequacy, lending interest rate, liquidity ratio and credit growth.

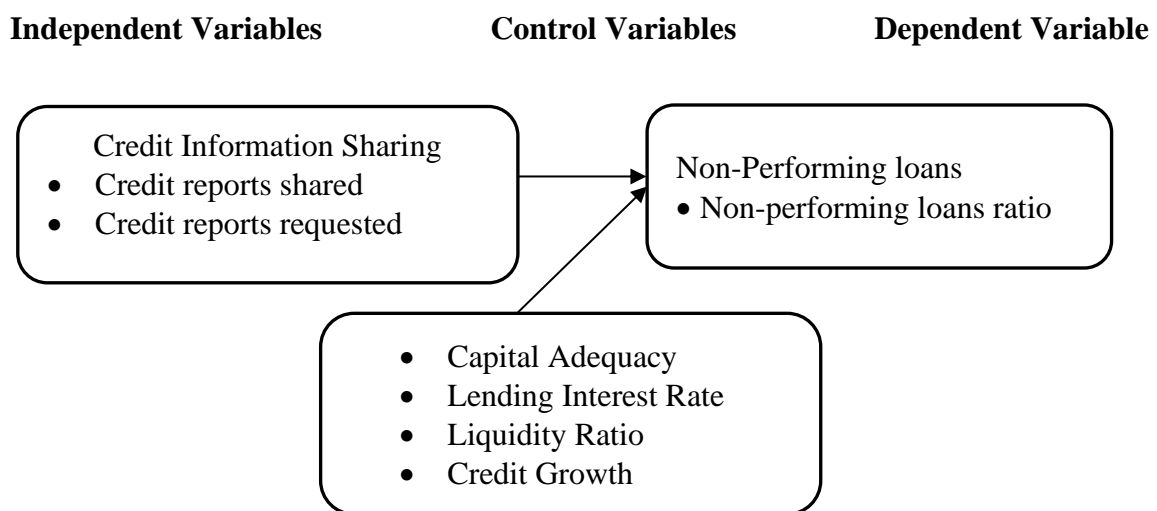


Figure 2. 1: Conceptual Framework

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

Research methodology outlines the procedures used in identification of target population, selection of a sample size, data collection and data analysis (Waddell, 2020). Specifically, this chapter sets out research design, population, sampling design, data collection, data analysis and presentation.

3.2 Research Design

The study adopted an explanatory research design. Explanatory research design is a type of research design that aims to explore the cause-and-effect relationship between variables. The primary goal of explanatory research is to provide a deeper understanding of the factors influencing a particular outcome or to determine the underlying mechanisms behind observed correlations (Sileyew, 2019). In this research explanatory research design showed how credit information sharing affects non-performing loans in Kenya.

3.3 Population

This is a group of services, events or individuals, items or households with similar features that the researcher is willing to investigate (Kumar, 2019). The target population was all the 43 commercial banks in Kenya as per The Central Bank of Kenya Bank Supervision report. This implies that the study excluded Imperial Bank Limited and Chase Bank (K) Limited, which are in receivership and Charterhouse Bank Limited which is under statutory management. In addition, NIC bank and CBA bank merged into NCBA bank. The target population was therefore all the 39 commercial banks in Kenya that are currently operational. Census survey was used.

3.4 Data collection

This research study made use of secondary panel data. Secondary panel data refers to a type of data that is collected by a primary source for a specific purpose but is subsequently made available for secondary analysis by other researchers or organizations. Panel data consists of observations collected from the same set of units over multiple time periods (Devi, 2019). In this study, secondary data on credit information sharing and non-performing loans in terms of non-performing loans ratio, was obtained from the annual reports of individual commercial banks as well as the Central Bank of Kenya. The data covered a period of five years starting from 2018 to 2022. The data was collected by use of a data collection checklist. The checklist comprised of five columns, which covered, the commercial banks, years, credit reports shared, credit reports requested and non-performing loans ratio.

3.5 Data Analysis Presentation

Data gathered using a checklist was in panel form as it comprised of 39 commercial banks. Panel data is a multi-dimensional measurement of data throughout time. Panel data includes observations of selected organizations, which in this study was commercial banks, gathered over a predetermined time period. This research covered 5 years (2018 to 2022) and encompassed 39 commercial banks in Kenya. Both descriptive and inferential statistics was used in the analysis of data with the help of statistical software known as STATA version 14. Descriptive statistics included mean, percentages, frequency distributions and also standard deviation. Inferential statistics included correlation analysis and regression analysis.

This study adopted a panel regression model. A panel regression model is a statistical model used to analyze panel data. It allows for the examination of the relationships between variables while accounting for both cross-sectional and time-series variations in the data (Bell, Bryman & Harley, 2019). The model is used in situations where data is on multiple

entities (firms) observed over multiple time periods. Panel data is particularly useful because it allows the researcher to control for both individual-specific and time-specific effects.

The panel regression model was as follows:

$$NPL_{it} = \beta_0 + \beta_1 CRS_{1it} + \beta_2 CRR_{2it} + \beta_3 CA_{3it} + \beta_4 LIR_{4it} + \beta_5 LR_{5it} + \beta_6 \ln CR_{6it} + \varepsilon_{it} \dots \dots \dots (1)$$

NPL represents Non-performing loans (ratio of NPLs to total loans and advances), β_0 represents Y intercept, $\beta_1 - \beta_6$ are coefficients of determination, CRS represents Credit Reports Shared (measured as the log of total annual reports shared with CRBs), CRR represents Credit Reports Requested (measured as the total annual reports requested from CRBs on borrower's creditworthiness), CA represents Capital Adequacy (Measured using Capital Adequacy Ratio), LIR represents Lending Interest Rate (Measured using bank specific interest rate), LR represents Liquidity Ratio (Measured using Current ratio) and CR represents (Percentage change in total loans), ε = error term, t subscript represents time, \ln represents Log to base 10 whereas i subscript symbolizes Commercial Banks.

Diagnostic tests that were conducted in this study include linearity test, normality test, multicollinearity test, heteroscedasticity test and Hausman test. Linearity was tested using scatter plot. A scatter plot is a type of graphical representation used to display individual data points for two variables on a Cartesian plane (Krishna, 2020). Each data point is plotted as a single point on the graph, with one variable on the horizontal (x-axis) and the other on the vertical (y-axis). Scatter plots are valuable for visualizing the relationships between two variables, helping to identify patterns, trends, and associations within the data. If the scatter plot follows a linear pattern (not a curvilinear pattern) that shows that linearity assumption is met.

Shapiro Wilk test was to test normal distribution. The Shapiro-Wilk test is a statistical test used to assess whether a dataset follows a normal distribution. It is one of the most widely used tests for checking the normality assumption in statistics (Kumar, 2019). The null hypothesis in the Shapiro-Wilk test is that the data is normally distributed. In other words, it assumes that the sample comes from a population that follows a normal distribution.

Multicollinearity was tested using Variance Inflation Factor. VIF is a common tool for detecting multicollinearity (Latwal, 2020). It quantifies how much the variance of the estimated regression coefficients is increased due to multicollinearity. A high VIF (usually above 10) indicates problematic multicollinearity. The study used Breusch-Pagan/Cook-Weisberg test to test for heteroscedasticity. The Breusch-Pagan test and the Cook-Weisberg test are statistical tests used to detect heteroscedasticity in a regression model. Heteroscedasticity occurs when the variance of the residuals (error terms) is not constant across different levels of the independent variables, potentially leading to unreliable coefficient estimates in regression analysis.

The Hausman test is a statistical test used in econometrics and regression analysis to determine whether two different estimation methods provide consistent and unbiased estimates of model parameters. Specifically, the test is applied when you have two sets of estimators, one of which is considered "consistent" (it provides unbiased and efficient estimates), and the other is "inconsistent" but potentially more efficient in finite samples (Sileyew, 2019). Null hypothesis during this study is that the random effect is a preferred model while the fixed effect mode is the alternative hypothesis.

CHAPTER FOUR

DATA ANALYSIS, INTERPRETATIONS AND PRESENTATION

4.1 Introduction

This chapter presents the results of the study, interpretations and discussions. The objective of the study was to determine the effect of credit information sharing on the non-performing loans among Kenyan commercial banks. The chapter begins with descriptive analysis, followed by diagnostic tests, Hausman test, as well as panel regression⁰analysis. The study used 35 commercial banks in Kenya for the period between 2018 to 2022.

4.2 Descriptive Statistics

Descriptive statistics involve using various techniques and measures to describe and summarize data in a meaningful and understandable way. Descriptive statistics included number of observations as well as calculation of mean, standard deviation, maximum, mean, and lowest values of dependent variable (non-performing loans) as well as the independent variables, credit information sharing (Credit reports shared and Credit reports requested) while the dependent variable will be non-performing loans. The control variables will be capital adequacy, lending interest rate, liquidity ratio and credit growth. The standard deviation(s), minimum(s), maximum values and mean (s) of the study variables were as shown in Table 4.1.

Table 4. 1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
NPL	175	14.196	4.843331	2.82	23.87
CRS	175	248.0171	216.696	42	1393
CRR	175	224.6286	206.0565	38	1253
CA	175	14.53493	2.916853	8.376	22.608
LIR	175	14.64489	1.490104	10.3	18.732
LR	175	73.58931	7.753898	51.33	93.33
CG	175	7.302629	12.58308	-52.4	46.76

There were 175 observations from 35 commercial banks in Kenya covering the period between 2018 and 2022. On average, the non-performing loans (NPL) among the 35 commercial banks for the period between 2018 and 2022 were approximately 14.20%, with a standard deviation of 4.84%, indicating variability around this average. The minimum and maximum values (2.82% to 23.87%) illustrate the range of non-performing loans in the dataset. On average, there are approximately 248 credit reports shared annually among the 35 commercial banks for the period between 2018 and 2022, with a substantial standard deviation of 216.70, indicating significant variability around this average. The range (42 to 1393) provides insight into the distribution of the number of credit reports shared. The results also show that there are approximately 224 credit reports requested annually among the 35 commercial banks for the period between 2018 and 2022, with a standard deviation of 206.06, indicating significant variability. The range (38 to 1253) illustrates the distribution of the number of credit reports requested.

On average, the capital adequacy (CA) among the 35 commercial banks for the period between 2018 and 2022 was approximately 14.53%, with a standard deviation of 2.92%. The range (8.38 to 22.61%) provides insight into the distribution of capital adequacy levels. On average, the lending interest rate (LIR) among the 35 commercial banks for the period between 2018 and 2022 was approximately 14.64%, with a standard deviation of 1.49%. The range (10.3 to 18.73) illustrates the distribution of lending interest rates. The average liquidity ratio (LR) among the 35 commercial banks for the period between 2018 and 2022 was approximately 73.59%, with a standard deviation of 7.75%. The range (51.33 to 93.33%) provides insight into the distribution of liquidity ratios. Also, the average credit growth (CG) among the 35 commercial banks for the period between 2018 and 2022 was approximately 7.30%, with a standard deviation of 12.58%. The range (-52.4 to 46.76%) shows the distribution of credit growth, including instances of negative growth.

4.3 Diagnostic Tests

Diagnostic tests are essential for assessing the validity of assumptions and the overall performance of a panel regression model. These are crucial for several reasons as they help to assess the validity of model assumptions, identify potential issues, and ensure the reliability of the results. Diagnostic tests focused on normality test, heteroscedasticity test, linear test, multicollinearity test, Hausman test and unit root tests.

4.3.1 Test for Normality

The Shapiro-Wilk test, developed by statisticians Samuel Sanford Shapiro and Martin Wilk, is a statistical test used to assess the normality of a data sample. It is a popular method for checking whether a dataset follows a normal distribution (Kumar, 2019). The test provides a p-value that indicates whether the data significantly deviate from normality. The null hypothesis of the Shapiro-Wilk test is that the data follows a normal distribution. In other words, it assumes that the data is normally distributed. The results were as shown in Table 4.2.

Table 4. 2: Shapiro-Wilk Test

	Shapiro-Wilk		
	Statistic	df	Sig.
Non-performing loans ratio	.962	175	.127
Credit Reports Shared	.963	175	.193
Credit Reports Requested	.984	175	.481
Capital Adequacy	.961	175	.124
Lending Interest Rate	.986	175	.062
Liquidity Ratio	.988	175	.135
Credit Growth	.987	175	.114

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

The Shapiro-Wilk test for normality on the non-performing loans ratio yields a p-value of 0.127. At significance level of 0.05, there no sufficient evidence to reject the null hypothesis that the data follows a normal distribution. In addition, the Shapiro-Wilk test for normality on the variable "Credit Reports Shared" yields a p-value of 0.193. Similar to the non-performing loans ratio, there is no strong evidence to reject the null hypothesis that the data follows a normal distribution. Also, Shapiro-Wilk test for normality on the variable "Credit Reports Requested" had a p-value of 0.481, which implies that the data was normally distributed. The test further shows that "Capital Adequacy" variable had a p-value of 0.124, imply that the data for capital adequacy was normally distributed. The results also indicate that "lending interest rate" variable had a p-value of 0.062 showing that the data was normally distributed. The Shapiro-Wilk test for normality on the "Liquidity Ratio" variable yields a p-value of 0.135 while "Credit Growth" variable produces a p-value of 0.114. As with other variables, there is no strong evidence against normality.

4.3.2 Heteroscedasticity Test

Breusch –Pagan/Cook- Weisberg test was used to test heteroscedasticity. The Breusch-Pagan test and the Cook-Weisberg test are statistical tests used to detect the presence of heteroscedasticity in a regression analysis. Heteroscedasticity occurs when the variability of the residuals (the differences between observed and predicted values) is not constant across different levels of the independent variables. The null hypothesis of the Breusch-Pagan test is that there is homoscedasticity, meaning that the variance of the residuals is constant across all values of the independent variables. The results were as presented in Table 4.3.

Table 4. 3: Breusch-Pagan Test for Heteroskedasticity

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of NPL

chi2(1) = 0.19

Prob > chi2 = 0.6621

As shown in Table 4.3, the p-value of 0.3426 was greater than the significance level of 0.05, which implies that there was homoscedasticity in the dataset. This is a favorable result for linear regression analysis because it means that one of the assumptions of classical linear regression (homoscedasticity) is met, and hence we can proceed with the analysis without the concern of heteroscedasticity affecting the validity of the results. Homoscedasticity indicates that the variability of the residuals is consistent and does not depend on the values of the independent variables.

4.3.3 Multicollinearity Test

The Variance Inflation Factor (VIF) is a statistical measure used to assess multicollinearity in regression analysis. Multicollinearity occurs when two or more independent variables in a regression model are highly correlated with each other, making it difficult to isolate the individual effects of each variable on the dependent variable (Saunders et al., 2018). VIF quantifies how much the variance of the estimated regression coefficients is increased due to multicollinearity. A variable whose VIF value is greater than 10 may merit further investigation. The results were as shown in Table 4.4.

Table 4. 4: Collinearity Statistics

Variable	VIF	1/VIF
Credit Reports Shared	4.42	0.226
Credit Reports Requested	4.18	0.239
Liquidity Ratio	2.33	0.429
Lending Interest Rate	1.89	0.529
Capital Adequacy	1.13	0.885
Credit Growth	1.08	0.926
Mean VIF	2.505	

From the findings, the VIFs for the variables, credit reports shared (4.42), credit reports requested (4.18), liquidity ratio (2.33), lending interest rate (1.89), capital adequacy (1.13) and credit growth (1.08) were less than 10. All of these VIF values are less than 10, which is a commonly used threshold to assess the severity of multicollinearity. In this context, VIF values less than 10 are considered acceptable and suggest that there is no severe multicollinearity among the independent variables.

4.3.5 Linearity Test

In linear regression analysis, one of the key assumptions is the assumption of linearity. This assumption states that there is a linear relationship between the independent variables and the dependent variable. A scatter plot is a graphical representation of data that displays individual data points on a two-dimensional graph (Bell et al., 2019). It is commonly used to visualize the relationship between two continuous variables or to identify patterns, trends, or outliers in data. Scatter plots are particularly useful for understanding the distribution and association between variables (Babbie, 2017).

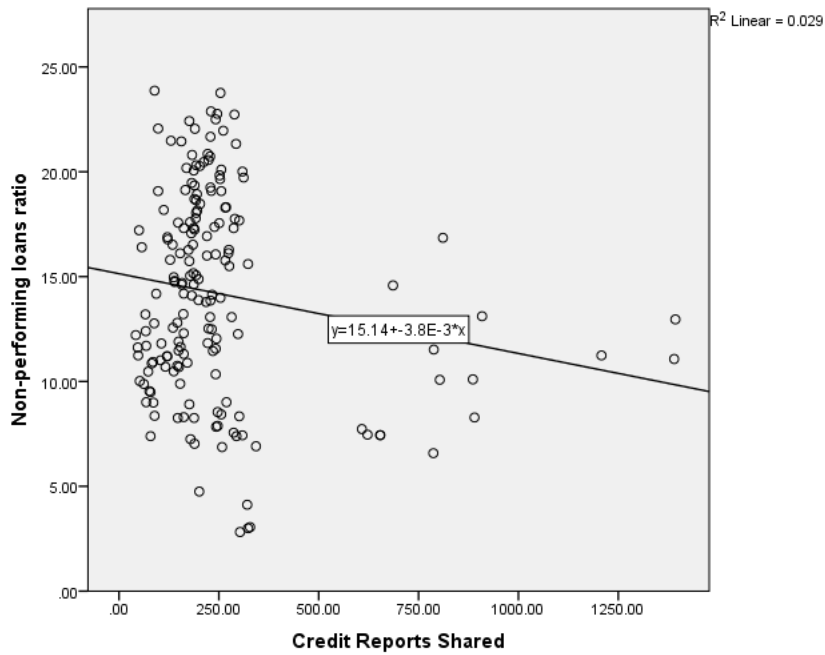


Figure 4. 1: Credit Reports Shared and Non-Performing Loans

As illustrated in Figure 4.1, the credit reports shared have a negative linear relationship with non-performing loans in commercial banks in Kenya. The results indicated that credit reports shared could explain 2.9% of the non-performing loans in commercial banks in Kenya. This implies that an increase in credit reports shared is negatively associated with non-performing loans in commercial banks in Kenya.

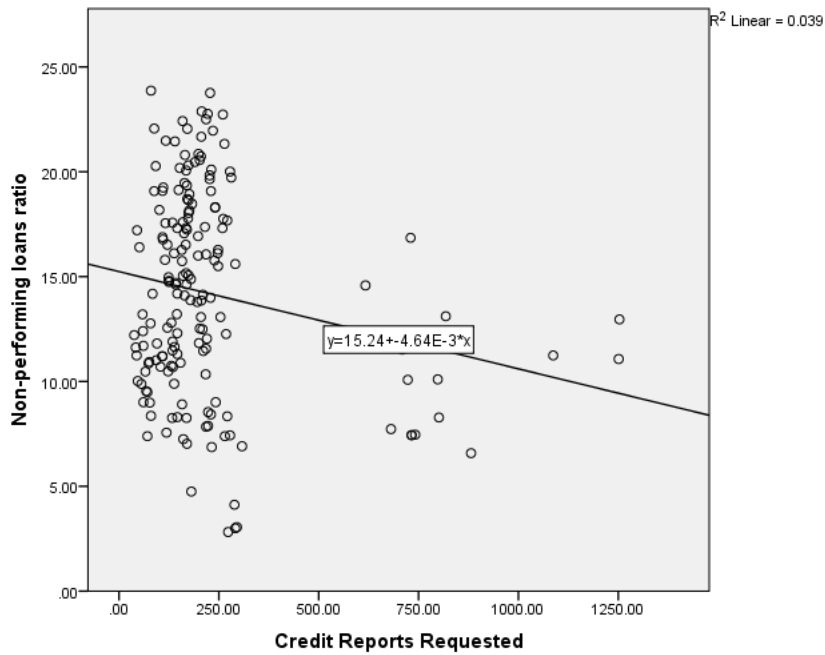


Figure 4. 2: Credit Reports Requested and Non-Performing Loans

As shown in Figure 4.2, the credit reports requested have a negative linear relationship with non-performing loans in commercial banks in Kenya. The results indicated that credit reports requested could explain 3.9% of the non-performing loans in commercial banks in Kenya. This implies that an increase in credit reports requested is negatively associated with non-performing loans in commercial banks in Kenya.

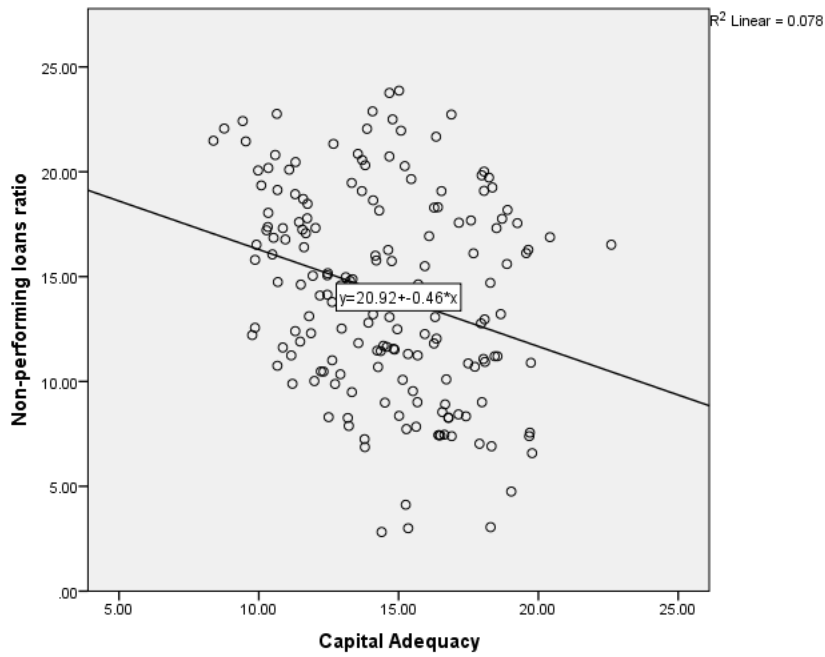


Figure 4. 3: Capital Adequacy and Non-Performing Loans

The results, as shown in Figure 4.3, the capital adequacy ratio had a negative linear relationship with non-performing loans in commercial banks in Kenya. The results indicated that capital adequacy ratio could explain 7.8% of the non-performing loans in commercial banks in Kenya. This implies that an increase in capital adequacy ratio is negatively associated with non-performing loans in commercial banks in Kenya.

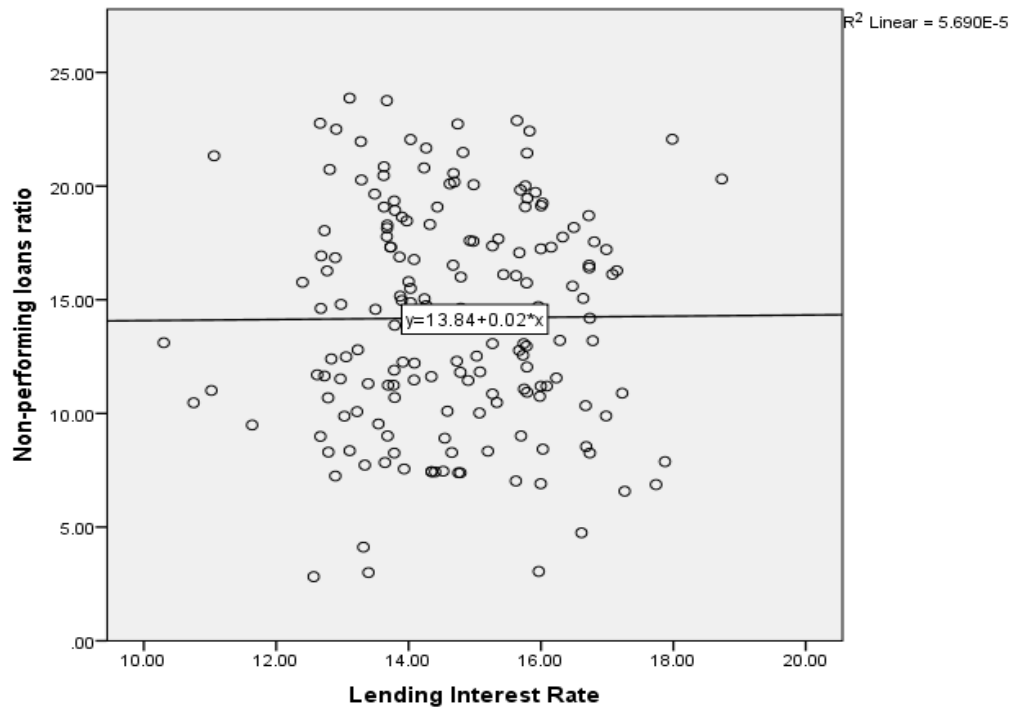


Figure 4. 4: Lending Interest Rate and Non-Performing Loans

From the results in Figure 4.4, the lending interest rate had no linear relationship with non-performing loans in commercial banks in Kenya. The results indicated that lending interest rate could explain less than 1% of the non-performing loans in commercial banks in Kenya. This implies that an increase in lending interest rate may not affect non-performing loans in commercial banks in Kenya considerably.

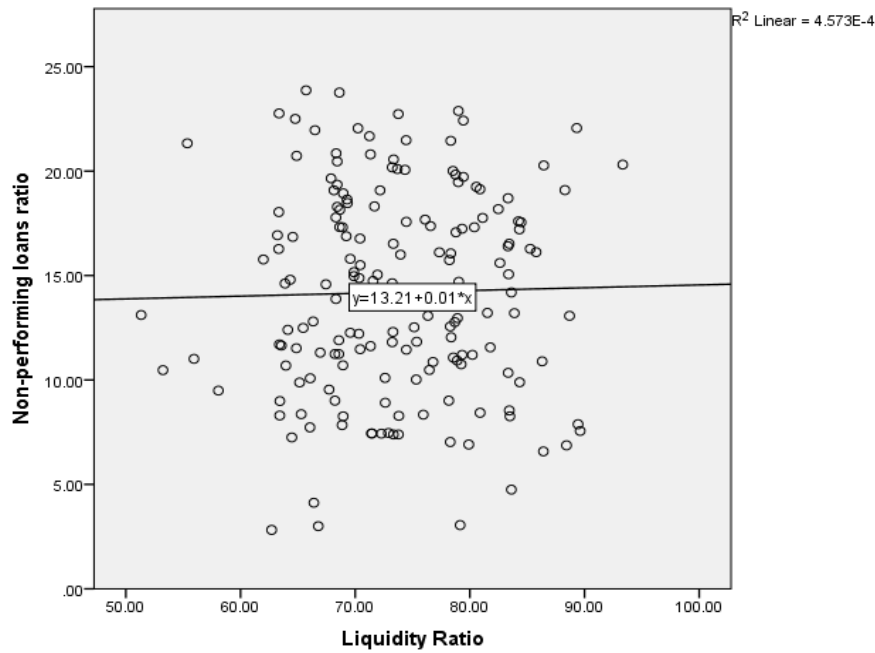


Figure 4. 5: Liquidity Ratio and Non-Performing Loans

As shown in Figure 4.5, the liquidity ratio has a non-significant relationship with non-performing loans in commercial banks in Kenya. The results indicated that liquidity ratio could explain less than 1% of the non-performing loans in commercial banks in Kenya. This implies that an increase in liquidity ratio may not affect non-performing loans in commercial banks in Kenya considerably.

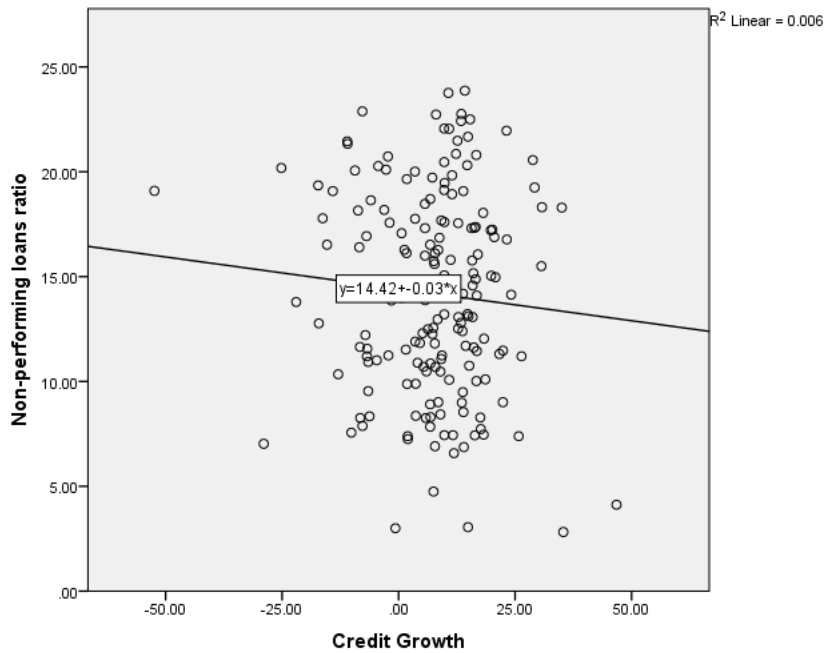


Figure 4. 6: Credit Growth and Non-Performing Loans

As illustrated in Figure 4.6, credit growth has a negative linear relationship with non-performing loans in commercial banks in Kenya. The results indicated that credit growth could explain 0.6% of the non-performing loans in commercial banks in Kenya. This implies that an increase in credit growth is negatively associated with non-performing loans in commercial banks in Kenya

4.3.6 Unit Root Test

The IPS (Im, Pesaran, and Shin) unit root test, also known as the IPS test or the Fisher-type test, is a statistical test used to examine whether a time series is stationary or non-stationary. Stationarity is an essential concept in time series analysis. A stationary time series has statistical properties (such as mean and variance) that do not change over time, making it more amenable to modeling and analysis. The null hypothesis suggests that there is a stochastic trend in the data, and the series does not exhibit stationarity.

Table 4. 5: IPS Unit-Root Test

Variable	t-statistic	p-value	Fixed-N exact critical values		
			1%	5%	10%
Non-performing loans ratio	-1.6916	0.6248	-2.140	-1.950	-1.850
Credit Reports Shared	-1.5745	0.7772	-2.140	-1.950	-1.850
Credit Reports Requested	-1.7480	0.4322	-2.140	-1.950	-1.850
Capital Adequacy	-1.6745	0.7034	-2.140	-1.950	-1.850
Lending Interest Rate	-1.7867	0.5455	-2.140	-1.950	-1.850
Liquidity Ratio	-1.8772	0.5232	-2.140	-1.950	-1.850
Credit Growth	-1.6443	0.6866	-2.140	-1.950	-1.850

The t-statistic for the non-performing loans ratio is -1.6916, and the associated p-value is 0.6248. The null hypothesis of the IPS test is that the data has a unit root (non-stationary). Since the p-value is greater than the significance level of 0.05, there is insufficient evidence to reject the null hypothesis. Thus, the non-performing loans ratio appears to have a unit root and is non-stationary. Similar to the non-performing loans ratio, the t-statistic for "Credit Reports Shared" is -1.5745, and the p-value is 0.7772. The p-value is greater than common significance levels, suggesting that there is insufficient evidence to reject the null hypothesis. The data has a unit root and is non-stationary. In addition, the t-statistic for "credit reports requested" is -1.7480, and the p-value is 0.4322. Again, the p-value is greater than common significance levels, indicating insufficient evidence to reject the null hypothesis. Therefore, the data has a unit root and is non-stationary.

The t-statistic for "capital adequacy" is -1.6745, and the p-value is 0.7034. Similar to the previous variables, there is insufficient evidence to reject the null hypothesis. As such, the series likely has a unit root and is non-stationary. In addition, the t-statistic for "lending

interest rate" is -1.7867, and the p-value is 0.5455. Again, there is insufficient evidence to reject the null hypothesis, indicating that the data has a unit root and is non-stationary. Also, the t-statistic for the "liquidity ratio" is -1.8772, and the p-value is 0.5232. Similar to the other variables, there is insufficient evidence to reject the null hypothesis, suggesting that the data has a unit root and is non-stationary. Also, the t-statistic for "credit growth" was -1.6443, and the p-value was 0.6866. Once again, there is insufficient evidence to reject the null hypothesis, indicating that the series likely has a unit root and is non-stationary.

4.4 Hausman Test

The Hausman test is a statistical test used in econometrics to determine whether a particular set of model parameters (coefficients) estimated using two different methods (typically, one is a more efficient estimator, and the other is less efficient but potentially biased) is consistent with the null hypothesis that both methods are estimating the same underlying population parameters. The null hypothesis in this study was that random influence was the most preferable model while fixed influence model was alternative hypothesis.

Table 4. 6: Hausman Test

```
hausman fixed random
```

	Coefficients		(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
	(b) fixed	(B) random		
Ln_CRS	-45.75979	8.472357	-54.23214	20.22523
Ln_CRR	39.35484	-9.19568	48.55052	20.23513
CA	-.5636252	-.8966366	.3330114	.2035684
LIR	.1179397	.8853756	-.7674359	.2304574
LR	-.0913811	-.230838	.1394568	.0441405
CG	.0103608	.0036252	.0067356	.

b = consistent under Ho and Ha; obtained from xtreg
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

```
chi2(6) = (b-B)'[(V_b-V_B)^(-1)](b-B)
          = 26.80
Prob>chi2 = 0.0002
(V_b-V_B is not positive definite)
```

Δ,

As illustrated in Table 4.7, Hausman specification test p value (0.000) was less than the alpha value of 0.05 (at 95% confidence interval). This implied that the null hypothesis was rejected implying that the study needs to use fixed effects model.

4.5 Panel Regression Analysis

Panel Regression is a combination of cross section data and time series, where the same unit cross section is measured at different times. Panel data is data from some of the same organizations observed in a certain period of time.

The panel regression model was as follows:

$$NPL_{it} = \beta_0 + \beta_1 CRS_{1it} + \beta_2 CRR_{2it} + \beta_3 CA_{3it} + \beta_4 LIR_{4it} + \beta_5 LR_{5it} + \beta_6 lnCR_{6it} + \epsilon_{it} \dots \dots \dots (2)$$

NPL represents Non-performing loans (ratio of NPLs to total loans and advances), β_0 represents Y intercept, $\beta_1 - \beta_6$ are coefficients of determination, CRS represents Credit Reports

Shared (measured as the log of total annual reports shared with CRBs), CRR represents Credit Reports Requested (measured as the total annual reports requested from CRBs on borrower's creditworthiness), CA represents Capital Adequacy (Measured using Capital Adequacy Ratio), LIR represents Lending Interest Rate (Measured using bank specific interest rate), LR represents Liquidity Ratio (Measured using Current ratio) and CR represents (Percentage change in total loans), ε = error term, t subscript represents time, \ln represents Log to base 10 whereas i subscript symbolizes Commercial Banks.

Table 4. 7: Regression Results

```

Fixed-effects (within) regression          Number of obs   =      175
Group variable: Banks                    Number of groups =      35

R-sq:  within   = 0.4587                  Obs per group:  min =      5
        between  = 0.1201                  avg   =      5.0
        overall  = 0.2123                  max   =      5

                                           F(6,134)        =      18.93
corr(u_i, Xb) = -0.8476                   Prob > F        =      0.0000

```

NPL	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
Ln_CRS	-45.75979	21.15831	-2.46	0.032	-87.60723	-3.912342
Ln_CRR	-39.35484	21.10614	-2.36	0.034	-81.389433	-21.09911
CA	-.5636252	.2465148	-2.29	0.024	-1.051188	-.0760619
LIR	.1179397	.6297269	0.19	0.852	-1.12755	1.36343
LR	-.0913811	.1247203	-0.73	0.465	-.3380561	.1552938
CG	.0103608	.0172865	0.60	0.550	-.0238289	.0445505
_cons	65.82113	12.40157	5.31	0.000	41.29298	90.34927
sigma_u	8.3185953					
sigma_e	2.3975078					
rho	.9233053	(fraction of variance due to u_i)				

```

F test that all u i=0:      F(34, 134) =      14.21      Prob > F = 0.0000

```

In the results, the R-squared shows the variation in the dependent variable that can be explained by the independent variables. From the findings, the R-squared within suggests that around 45.87% of the variation in the dependent variable (NPL) is explained by the independent variables within each group. The R-squared between suggests that

approximately 12.01% of the variation is explained by differences between groups. The overall R-squared (across all groups) is 21.23%. In this study, the p-value for the F-test was 0.000, which is less than the significance level (0.05). This means that the model is a good fit for the data. In this study, the p-value for the F-test was 0.000, which is less than the significance level (0.05). This means that the model is a good fit for the data.

The results show that credit reports shared have a negative and significant effect on the non-performing loans among Kenyan commercial banks. The coefficient of -45.75979 indicates that, on average, a one-unit increase in the log of credit reports shared is associated with a decrease of approximately 45.76 units in non-performing loans. The p-value of 0.032 is less than the conventional significance level of 0.05, suggesting that the variable is statistically significant. Therefore, the log of credit reports shared is likely to have a significant impact on reducing non-performing loans for commercial banks in Kenya.

The results show that credit reports shared have a negative and significant effect on the non-performing loans among Kenyan commercial banks. The coefficient of -39.35484 suggests that a one-unit increase in the log of credit reports requested is associated with a decrease of approximately 39.35 units in non-performing loans. The p-value of 0.034 is less than 0.05, indicating statistical significance. Therefore, the credit reports requested is likely to have a significant impact on reducing non-performing loans for commercial banks in Kenya.

In addition, the results show that capital adequacy have a negative and significant effect on the non-performing loans among Kenyan commercial banks. The coefficient of -0.5636252 implies that, on average, a one-unit increase in capital adequacy is associated with a decrease of approximately 0.56 units in non-performing loans. The p-value of 0.024 is less than 0.05, suggesting that capital adequacy is statistically significant in reducing non-performing loans for commercial banks in Kenya.

The results show that lending interest rate has no significant effect on non-performing loans for commercial banks in Kenya. The coefficient of 0.1179397 indicates that a one-unit increase in lending interest rate is associated with an increase of approximately 0.12 units in non-performing loans. However, the high p-value of 0.852 suggests that this relationship is not statistically significant. Therefore, lending interest rate is not a significant predictor of non-performing loans in the context of these results.

Further, the results show that liquidity ratio has no significant effect on non-performing loans for commercial banks in Kenya. The coefficient of -0.0913811 suggests that a one-unit increase in liquidity ratio is associated with a decrease of approximately 0.09 units in non-performing loans. However, the p-value of 0.465 is greater than 0.05, indicating that this relationship is not statistically significant. Therefore, liquidity ratio is not a significant predictor of non-performing loans in this context.

Also, the results show that credit growth has no significant effect on non-performing loans for commercial banks in Kenya. The coefficient of 0.0103608 implies that a one-unit increase in credit growth is associated with an increase of approximately 0.01 units in non-performing loans. However, the p-value of 0.550 is greater than 0.05, suggesting that this relationship is not statistically significant. Therefore, Credit Growth may not be a significant predictor of non-performing loans in the context of these results.

4.6 Discussion of the Findings

The study found that credit information sharing has a significant effect on the non-performing loans among Kenyan commercial banks. Specifically, the study found that credit reports shared have a negative and significant effect on the non-performing loans among Kenyan commercial banks. In addition, credit reports shared have a negative and significant effect on the non-performing loans among Kenyan commercial banks. The findings agree with Adusei and Adeleye (2022) findings that credit information sharing plays a key role in reducing non-performing loans in developing countries. The findings are also in agreement with Agyei-Boapeah, Fosu and Ntim (2019) findings that credit information sharing reduces loan default rate in developing countries. Also, the findings are in concurrence with Hoang, Nguyen and Elgammal (2022) findings that credit information sharing decreases the nonperforming loans. Also, the findings agree with Segihanga (2022) findings that credit information sharing had a significant effect on loan performance in commercial banks on Rwanda. However, the findings are contrary to Zahra (2022) and Kabui (2016) findings that there is no significant relationship between credit information sharing and non-performing loans.

The study revealed that capital adequacy has a negative and significant effect on the non-performing loans among Kenyan commercial banks. The findings are in agreement with Khan, Siddique and Sarwar (2020) findings that capital adequacy has a significant negative effect on non-performing loans in commercial banks in developing countries. The findings are also contrary to Khoirunisa and Karnasi (2023) argument that capital adequacy has a significant negative effect on non-performing loans among commercial banks listed in Indonesia Stock Exchange.

In addition, the study found that lending interest rate has no significant effect on non-performing loans for commercial banks in Kenya. The findings are contrary to Khoirunisa

and Karnasi (2023) findings that Lending interest rate was one of the factors significantly influencing non-performing loans. The findings are also contrary to Asfaw and Bogale (2018) findings indicating that higher interest rates can contribute to an increase in NPLs.

Further, the study revealed that liquidity ratio has no significant effect on non-performing loans for commercial banks in Kenya. The findings agree with Khoirunisa and Karnasi (2023) observation that liquidity ratio has no significant effect on non-performing loans among commercial banks listed in Indonesia Stock Exchange. The findings are in disagreement with Uma and Naail (2019) findings that liquidity has a negative effect on non-performing loans in commercial banks.

Also, the study established that credit growth has no significant effect on non-performing loans for commercial banks in Kenya. The findings disagree with Erdas and Ezanoglu (2022) findings that credit growth had a positive effect on non-performing loans of commercial banks among commercial banks in G20 countries. In addition, the findings disagree with Mosharrof and Nazim (2020) observation that one of the bank-specific factors affecting non-performing loans in Bangladesh is credit growth.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of the findings, conclusions and recommendations for practice and areas for future research. The general objective of this study was to determine the effect of credit information sharing on the non-performing loans among Kenyan commercial banks.

5.2 Summary of the Findings

The study found that credit information sharing has a significant effect on the non-performing loans among Kenyan commercial banks. Specifically, the study found that credit reports shared and credit reports shared have a negative and significant effect on the non-performing loans among Kenyan commercial banks. The negative and significant effect indicates that as the extent of credit information sharing increases, there is a corresponding decrease in non-performing loans. This suggests that comprehensive credit reporting and sharing of credit information contribute positively to credit risk management, enabling banks to make more informed lending decisions and reduce the risk of loans turning non-performing.

The study revealed that capital adequacy has a negative and significant effect on non-performing loans among Kenyan commercial banks. The negative effect suggests that higher levels of capital adequacy are associated with lower levels of non-performing loans. Adequate capital acts as a financial buffer, providing banks with the capacity to absorb losses and maintain stability during economic downturns or unexpected shocks. This finding emphasizes the importance of strong capital positions for banks in managing credit risk.

The study found that lending interest rate has no significant effect on non-performing loans for commercial banks in Kenya. The lack of significance suggests that, according to the study, changes in lending interest rates do not have a measurable impact on the occurrence of non-performing loans. While interest rates are a critical factor in lending, other factors may be more influential in determining the creditworthiness of borrowers and the likelihood of loan default.

The study found that liquidity ratio has no significant effect on non-performing loans for commercial banks in Kenya. The lack of significance implies that, according to the study, variations in liquidity ratios (a measure of a bank's ability to meet short-term obligations) do not have a discernible impact on the incidence of non-performing loans. Other factors may play a more crucial role in influencing credit quality.

The study established that credit growth has no significant effect on non-performing loans for commercial banks in Kenya. The lack of significance indicates that, according to the study, changes in the rate of credit growth do not have a statistically significant impact on the occurrence of non-performing loans. This finding suggests that the volume of credit extended by banks may not be a major driver of non-performing loans in the context of the study.

5.3 Conclusion

The study concludes that credit information sharing has a significant effect on the non-performing loans among Kenyan commercial banks. Specifically, the study found that credit reports shared have a negative and significant effect on the non-performing loans among Kenyan commercial banks. In addition, credit reports shared have a negative and significant effect on the non-performing loans among Kenyan commercial banks. The study revealed that capital adequacy has a negative and significant effect on the non-performing loans among Kenyan commercial banks. However, the study found that lending interest rate,

liquidity ratio and credit growth has no significant effect on non-performing loans for commercial banks in Kenya.

5.4 Recommendations

The study found that credit information sharing has a significant negative effect on non-performing loans in Kenyan commercial banks. The study recommends that the management financial institutions should actively encourage and enhance credit information sharing practices. This involves collaborating with credit reporting agencies and other financial institutions to share accurate and up-to-date credit information. Emphasizing the importance of comprehensive credit reporting can contribute to a more informed lending environment.

The management of financial institutions should use the information obtained through credit reports to make informed lending decisions. This includes assessing the credit risk of potential borrowers and tailoring lending terms based on their credit history. By promoting responsible lending practices, banks can minimize the likelihood of non-performing loans. The study also recommends the management of the banks should provide continuous training to banking staff on the importance of credit information sharing and how to interpret credit reports.

The study recommends that the government of Kenya should encourage regulatory authorities to support and promote comprehensive credit reporting practices. Policies should facilitate the sharing of accurate and comprehensive credit information among financial institutions, ensuring that the regulatory framework is conducive to responsible credit reporting. Policymakers should develop and enforce policies that ensure customer consent for the sharing of their credit information. Additionally, implement robust privacy protection measures to safeguard sensitive financial data. This can include transparent disclosure practices and mechanisms for customers to control the sharing of their information.

Given that capital adequacy has a negative and significant effect on non-performing loans, banks should focus on maintaining and strengthening their capital positions. Adequate capital can act as a buffer against financial shocks and contribute to the stability of the banking sector.

5.5 Areas for Further Research

The study sought to determine the effect of credit information sharing on the non-performing loans among Kenyan commercial banks. The findings focused on commercial banks in Kenya and hence the findings cannot be generalized to other financial institutions in Kenya including microfinance banks and Savings and credit cooperative societies. The study therefore recommends further studies on the effect of credit information sharing on the non-performing loans in microfinance banks and Savings and credit cooperative societies. The study also found that credit information sharing, capital adequacy, lending interest rate, liquidity ratio and credit growth explain 45.87% of non-performing loans. Therefore, the study suggests further studies on other factors affecting non-performing loans among Kenyan commercial banks.

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APPENDICES

Appendix I: Data Collection Checklist

Commercial Banks	Years	Non-performing loans	Credit Reports Shared	Credit Reports Requested	Capital Adequacy	Lending Interest Rate	Liquidity Ratio	Credit Growth
		Ratio of NPLs to total loans and advances	Total annual reports shared with CRBs	Total annual reports requested from CRBs on borrower's creditworthiness	Capital Adequacy Ratio	Bank specific interest rate	Current ratio	Percentage change in total loans per year