

**ASSESSING EFFECTS OF NON PERFORMING LOANS AND FINANCIAL
PERFORMANCE IN BANKING INDUSTRY IN RWANDA
A CASE STUDY OF BANK OF KIGALI PLC (2011-2022)**

By

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Degree in Economics**

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DECLARATION

I, **IRAKOZE NDANGUZA Henry Amen** hereby declare that the work presented in this thesis entitled **Assessing effects of Non-performing loans and financial performance in banking industry in Rwanda; Bank of Kigali Plc (2011-2022)** as a case study has been composed by myself and has never been submitted to any University for an academic award.

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Date/...../.....

APPROVAL

This thesis entitled, **Assessing effects of Non-performing loans and financial performance in banking industry in Rwanda; Bank of Kigali Plc (2011-2022) "** prepared and submitted by **IRAKOZE NDANGUZA Henry Amen** in partial fulfillment of the requirements for the degree of Masters in Economics has been examined and approved by the Supervisor.

Supervisor: GISANABAGABO Sebhuzu, PhD

Signed.....

Date/...../.....

DEDICATION

To

My Parents;

My brothers;

My friends and relatives;

Your encouragements and precious support were immeasurable and will never be forgotten

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It is more than a pleasure; it is a bounden duty as well for me to offer my sincere gratitude to all who helped me and contributed immensely in various ways to make this work a success. First of all, I would like to thank the Almighty God for giving me the sound health and determination for this hard work. I would like also to express my sincere gratitude and thank the following people, who without their help and support, I would not have been able to complete this work.

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LIST OF ABBREVIATIONS

BK: Bank of Kigali Plc

ROA: Return on Asset

ROE: Return on Equity

NPLs: Non-Performing Loans

BS: Bank Size

BNR: Banque Nationale du Rwanda

LDR: Loan to Deposit Ratio

NIM: Net Interest Margin

US: United States

GDP: Gross Domestic Product

IMF: International Monetary Fund

NPM: Net Profit Margin

CAR: Capital Adequacy Ratio

ABSTRACT

This study assesses how non-performing loans (NPLs) affect banks' performance in Rwanda as the escalating issue of Non-Performing Loans (NPLs) has emerged as a critical factor with profound implications for the financial performance of commercial banks in Rwanda. The study focuses on secondary time series data from Bank of Kigali Plc between 2011 and 2022, using financial statement in annual reports. Data analysis methods include tabulations, graphs, and regression analysis to assess relationships between key variables.

Through the descriptive analysis, the Return on Assets (ROA) showcases a robust financial performance, with an average of 3.66%, ranging from a minimum of 3.3% to a maximum of 4.0%. Conversely, Non-Performing Loans (NPL) present an average of 33.88%, spanning from a minimum of 10.9% to a maximum of 69.7%, signaling variability in loan quality. Moreover, The Return on Equity (ROE) demonstrates encouraging outcomes, with an average value of 19.52%, firmly affirming a healthy return on equity which ranges from a minimum of 16.0% to a maximum of 22.9%, further underscoring the positive trajectory. Non-Performing Loans (NPL) record an average of 33.88%, with values fluctuating between 10.9% and 69.7%, signifying the variances in loan quality.

A regression model analysis reported significant insights through the ROE model which highlights that a one-unit increase in Non-Performing Loans (NPL) is associated with an estimated decrease of approximately 0.151-unit in ROE, emphasizing the paramount importance of effective NPL management for sustaining a robust ROE, assuming constant factors. Conversely, the model for ROA generated non-significant coefficients which implies that the ROA might not strongly influence the NPL and This non-significance can be attributed to the sample size's limitations and the complex interplay of Rwandan financial variables.

To strengthen their market presence, Rwandan banks are advised to assess borrower risk profiles, lending practices, and risk evaluation procedures. Additionally, diversifying the deposit base and implementing prudent risk management practices can help mitigate NPLs, enhance financial stability, and promote a more balanced banking ecosystem in Rwanda.

Key words: Non-performing loans, Financial performance, banking industry, Rwanda.

CHAPTER 1: GENERAL INTRODUCTION

1.1 Introduction

This chapter is an initial chapter anticipated to deal with the background of the study, the statement of the problem, the objectives of the study, the significance of the study, the research questions, the limitations of the study and the scope of the study entitled: Factors of non-performing loans towards financial performance in Rwanda with a case study of Bank of Kigali Plc.

1.2 Background of the Study

The background of the study provides contextual information about the factors influencing non-performing loans (NPLs) and their impact on the financial performance of Bank of Kigali Plc in Rwanda. This section outlines the significance of the study, the rationale for selecting Bank of Kigali Plc as the case study, and the importance of understanding NPLs in the Rwandan banking sector.

Financial crisis in many ways can arise from factors specific to the bank or macroeconomic conditions. Relative causes of NPLs occurrence cited by some researchers includes; economic condition like inflation, interest rates, whereas bank specific factors include efficiency of the bank, bank capital, income diversification among others. This section presents and discusses different determinants of Non-Performing Loans including efficiency of the bank, bank capital, and income diversification.

Economic Factors: Economic factors play a crucial role in loan repayment capacity and the occurrence of NPLs. According to the theory of credit risk, fluctuations in macroeconomic variables such as GDP growth, inflation, unemployment rates, and interest rates can significantly affect borrowers' ability to repay their loans. A deteriorating economic environment can lead to increased defaults and a higher level of NPLs (Klein N. , 2013).

Borrower Characteristics: The characteristics of borrowers have been identified as important determinants of NPLs. The theory of borrower risk suggests that factors such as income level, employment status, credit history, and financial literacy can influence the probability of default. Borrowers with lower income levels, unstable employment, poor credit history, and limited

financial knowledge are more likely to experience difficulties in repaying their loans, resulting in higher NPLs (Chioma Ngozi Nwafor, Obumneme Zimuzor Nwafor, 2023).

Credit Risk Assessment and Lending Policies: Effective credit risk assessment practices and sound lending policies are crucial in managing NPLs. The theory of credit risk management emphasizes the importance of rigorous evaluation of borrowers' creditworthiness, collateral valuation, loan monitoring, and risk management frameworks. Inadequate credit analysis, weak collateral valuation, and lax loan monitoring practices can increase the risk of NPLs (MALUNI, 2011).

Non-Performing Loans (NPLs) represent a global financial challenge. In the aftermath of past financial crises, the management and consequences of NPLs have garnered attention on a global scale. The interconnectedness of international financial markets means that NPL-related issues can have far-reaching consequences beyond national borders. The study recognizes that the effects of NPLs are not limited to Rwanda alone but are part of a broader international discourse on financial stability this means that non-performing loans pose a significant challenge to the stability and profitability of banks worldwide. In the East African Community (EAC) region, which encompasses Rwanda, Kenya, Tanzania, Uganda, Burundi, and South Sudan, the impact of NPLs is of regional significance. The EAC is characterized by growing economic integration, and the banking sector plays a pivotal role in facilitating cross-border trade and investment. Consequently, issues related to NPLs, their management, and their impact on financial institutions have implications for the entire EAC region. (Mr. S. K Wajid, Mr. Paulo Drummond and Mr. Oral Williams, 2015)

For example, the financial performance and stability of banks, including Bank of Kigali PLC in Rwanda, can influence regional financial flows and investment decisions. The study acknowledges the interconnectedness of financial markets within the EAC and the importance of understanding how NPLs affect regional banking dynamics. In the specific context of Rwanda, the study focuses on Bank of Kigali PLC as a case study. Rwanda, as a rapidly developing economy, is in a state of transformation, and its banking industry plays a crucial role in supporting economic growth and financial stability. The presence of NPLs in Rwanda's banking sector has implications for the country's economic development and the stability of its financial institutions. As the banking sector continues to grow and play a vital role in the country's economic development, the issue of NPLs becomes increasingly important. Assessing effects of

NPLs on the financial performance of banks is essential for maintaining a healthy and robust banking system. (Ozurumba, 2016).

Bank of Kigali PLC, as one of Rwanda's prominent banks, serves as a microcosm of the broader challenges and opportunities within the country's financial landscape. The study aims to provide valuable insights into how NPLs impact the financial performance of this bank and, by extension, how this influence contributes to Rwanda's economic stability and growth. The research study recognizes that the effects of Non-Performing Loans on the banking industry are part of a global conversation on financial stability, are integral to regional dynamics within the East African Community, and have direct implications for Rwanda's economic development and financial stability.

The thesis is organized in five chapters. The first chapter is the general introduction which includes the background and the purpose of the study. The second chapter is the related Literature review. The third chapter is the Research design methodology. The fourth chapter is Data analysis and Interpretation and the last Chapter is summary of findings, conclusions and recommendations.

1.3 Problem statement

In the dynamic landscape of Rwanda's financial sector, the escalating issue of Non-Performing Loans (NPLs) has emerged as a critical factor with profound implications for the financial performance of commercial banks as reported in "Monetary Policy and Financial Stability Statement from 2019 to 2022," released by the esteemed Banque Nationale du Rwanda (BNR). The adverse impact of inflation, fueled by commodity price fluctuations and supply chain disruptions, has heightened credit risk, particularly for banks exposed to energy-intensive sectors like manufacturing and transport. (Ehlers, 2022).

In addition, the COVID-19 pandemic's impact on NPL ratios is to be considered. Given the pivotal role of banks in fostering economic growth, it is imperative on how NPLs intersect with financial performance, especially in the case of the Bank of Kigali Plc. This research seeks to assess the extent of NPLs within the Bank of Kigali Plc's loan portfolio while delving into their potential negative influence on key financial performance metrics.

1.4 Objectives of the study

The main objective of the study is to assess the impact of non-performing loans on the financial performance of the Bank of Kigali Plc through a comprehensive analysis of their interrelationship.

1.5 Specific Objectives

Specifically, the study was guided by the following specific objectives.

1. Determine effects of non-performing loans on Return on Asset in Bank of Kigali Plc.
2. Evaluate effects of non-performing loans on Return on Equity in Bank of Kigali Plc.

By accomplishing the objective, the study aims to assess effects of NPLs on the financial performance in Bank of Kigali Plc, ultimately providing valuable insights for effective NPL management and improved financial performance in the Rwandan banking sector.

1.6 Research questions

Based on objectives, the study attempts to find answers to the following questions:

1. How does the presence of non-performing loans impact the Return on Assets (ROA) in Bank of Kigali Plc?
2. What is the relationship between non-performing loans and Return on Equity (ROE) in Bank of Kigali Plc?

1.7 Justification of the Study

The justification of the study highlights the reasons and importance of conducting research on the factors influencing non-performing loans (NPLs) and their impact on the financial performance of Bank of Kigali Plc in Rwanda. This section presents the rationale for the study, emphasizing its relevance to the banking sector, the academic community, and the stakeholders involved.

1.7.1 Academic Contribution:

The study contributes to the existing body of knowledge on NPLs and their implications for financial performance in the banking sector. By conducting a case study of Bank of Kigali Plc, the research adds to the limited literature specifically focusing on the Rwandan banking

context. The findings provide empirical evidence and insights into the factors influencing NPLs and their impact on financial performance, thereby filling the research gap in this area.

1.7.2 Policy and Decision-Making Relevance:

The study holds significant implications for policymakers, regulators, and bank managers in Rwanda. Understanding the factors contributing to NPLs and their impact on financial performance helps inform the development of effective policies and strategies to mitigate credit risk and enhance the stability and profitability of banks. The findings can guide decision-makers in formulating measures to improve loan portfolio quality, implement risk management practices, and ensure sustainable financial performance.

1.7.3 Bank of Kigali Plc Stakeholder Benefits:

The research directly benefits Bank of Kigali Plc as the case study organization. By identifying the factors influencing NPLs and their impact on financial performance, the study offers valuable insights to the bank's management and stakeholders. The findings can support evidence-based decision-making, enabling the bank to develop targeted strategies to manage NPLs, improve loan portfolio quality, and enhance financial performance.

1.8 Scope and Limitations of the study

The scope of the study defines the boundaries and focus of the research. In this case, the study aims to assess effects of non-performing loans (NPLs) on financial performance of Bank of Kigali Plc in Rwanda. This section outlines the specific aspects and limitations of the study.

1.8.1 Geographical Scope:

The study focuses specifically on the Rwandan banking sector, with Bank of Kigali Plc as the case study. It aims to assess effects of non-performing loans (NPLs) on financial performance of this particular bank. While the findings may have implications for the broader banking sector in Rwanda, the study does not encompass other banks or financial institutions in the country.

Bank of Kigali Plc was selected as the case study for several reasons:

Market Importance: Bank of Kigali Plc is one of the largest and most influential banks in Rwanda, with a significant market share. As a prominent player in the banking sector, the bank's performance has implications for the overall stability and competitiveness of the sector.

Data Availability: Bank of Kigali Plc provides annual reports, financial statements, and other relevant data that can be used to analyze the bank's loan portfolio quality, financial performance indicators, and other variables related to NPLs. The availability of such data facilitates a comprehensive analysis of the factors influencing NPLs and their impact on financial performance.

1.8.2 Time Frame:

The time frame for assessing effects of non-performing loans (NPLs) towards financial performance in Rwanda, specifically focusing on the case study of Bank of Kigali Plc, is from 2011 to 2022. The starting date (2011) was chosen because it is the year Bank of Kigali Plc was listed in Rwanda Stock Exchange and the ending year (2022) was the most recent annual data published.

1.8.3 Variables and Factors:

The study focuses to assess effects of non-performing loans (NPLs) on financial performance of Bank of Kigali Plc. The variable considered is non-performing loans ratio and the study examines its relationship and effect on financial performance indicators such as Return on Assets and Return on Equity.

1.8.4 Data Accessibility:

The scope of the study depends on the availability of relevant data from Bank of Kigali Plc. The study utilizes secondary data from financial statements in annual reports. The extent and quality of data may influence the depth and breadth of the analysis conducted in the study.

1.8.5 Limitations:

It is important to acknowledge the limitations of the study. Some potential limitations include:

Generalizability: The findings of the study may not be directly applicable to other banks or financial institutions in Rwanda or other countries due to the specific characteristics and circumstances of Bank of Kigali Plc.

Data Limitations: The availability and quality of data from Bank of Kigali Plc may pose limitations on the depth and comprehensiveness of the analysis. Data constraints or incomplete records may impact the accuracy and generalizability of the findings.

External Factors: The study may not consider all external factors that could impact NPLs and financial performance, such as regulatory changes, political instability, or global economic events. These factors may introduce additional complexity and influence the study outcomes.

The scope of the study focuses on understanding the factors influencing non-performing loans and their impact on the financial performance of Bank of Kigali Plc in Rwanda. It delineates the geographical scope, time frame, variables, and data availability within which the research is conducted. Acknowledging the limitations of the study is important to interpret the findings accurately and to recognize any constraints that may affect the generalizability of the results.

CHAPTER 2: RELATED LITERATURE REVIEW

This chapter covers four important parts that include theoretical review, empirical studies, theoretical framework, and the conceptual framework. Literature

2.1 Theoretical review

The part covers various theories adopted in the study on lending and performance of loans in financial institutions. Theories presented here are those that explain lending dynamics in terms of leading factors of Non-Performing Loans, and remedial strategies. They include credit default theory, Information Asymmetric Information theory, and Accelerator theory.

Researchers for a long time, have developed a variety of theories and assumptions that try to provide explanation of the factors related to the occurrence and accumulation of non-performing loans in commercial banks. The development of literature work assessing non-performing loans is attributed to the fact that non-performing loans bear a very negative effect on financial performance of commercial banks. Scholars who conducted studies in different parts of the world like Argentina, East Asia and sub-Saharan Africa have proved that nonperforming loans are strongly associated with low financial performance of 1990s and mostly recently in US and Europe (Anayochukwu, 2016).

The moral credit default theory, financial accelerator theory, and information asymmetry theory were developed to confirm hypothesis of impact of non-performing loan to the financial performance of commercial banks in general.

2.1.1 Credit Default Theory

Credit Default Theory has been developed by Wilson Sy in 2007. Most current credit default theories fail to establish a linkage between the causes and effects of loan defaults and cannot assess credit risks in a very dynamic market environment as experienced in the recent mortgage and credit market crisis. This theory helps managers assess credit risks analytically and eventually to measure and manage credit risk energetically to enhance the stability of the financial system. Wilson Sy strongly believes that credit default is due to both delinquency and insolvency. This theory is relevant for circumstances where there exists indirect relation to the effect of default that affect the financial performance (Sy, 2007).

Delinquency is defined as a situation where the borrower fails to meet a loan payment per the loan repayment schedules. On the other hand, insolvency is defined as a state of a banking institution where liabilities are greater than assets. The term credit default really revolves around the concept of delinquency. Delinquency takes place when a customer who borrowed money fails to make a loan repayment as per the agreed loan repayment schedules. When a banking institution becomes delinquent, it triggers assessment of solvency which can lead to a conclusion of negative equity position that can cause loan termination and lead to loss on the side of the lender. When credit officers are assessing borrowers' suitability, one of the main factors of consideration is the loan serviceability. However, there are unpredictable factors that can lower the borrowers' loan serviceability. This means that it can change over time due to individual circumstances and changes in micro and macro-economic conditions. A loan which may have started off as being simply a serviceable loan may become so hard to the borrower due to unpredictable adverse factors from the environment. In summary various scholars over time, attempted to explain nonperforming loans and effects on financial performance of banking institutions. They all noted that delinquency occurs when borrowers is unable to repay the loans by the due dates and that this affects banking operations and eventually lead to low financial performance (Claessens, 2017).

This theory is very significant in the study. It helped the researcher and is intended to be helpful to the audience and the managers of commercial banks in particular in paying more attention to how lending operations should be managed. It reiterates the importance of preventing or minimizing credit delinquency by carefully analyzing different factors that can cause borrowers to default. Preventing or keeping delinquency at a minimum possible helps banking institutions to minimize possibilities of insolvency. Low levels of delinquency eventually lead to good performance of the loan portfolio and in turn help commercial banks to have improved financial performance.

2.1.2 Information Asymmetry Theory

According to ROSS (2022) the development of the famous economic theory of information asymmetry can be traced back to 1970s and 1980s by three renown scholars namely George Akerlof, Michael Spence and Joseph Stiglitz. It provided a credible explanation of potential factors of market failures.

Economists define market failure as a situation where there is an inefficient distribution of goods and services in free market, where demand and supply are the only determinants of price.

The theory posits that information imbalances between customers and sellers lead to market failure. Information Asymmetry Theory is relevant in lending circumstances where the lender has inadequate knowledge. In particular, one party has limited or distorted information on the other. Asymmetric information constitutes a big challenge in financial market especially in borrowing and lending operations. It is believed that the borrower knows much better about his financial state than the one lending. Asymmetry of information has to be considered since credit managers need to make truthful information to make sound economic and lending decisions. Accessing information on borrowers from different sources helps to have adequate information on credit applicants. This theory of information asymmetric tells us that it may be difficult to distinguish good from bad borrowers, which may result into adverse selection and moral hazards problems. The theory posits that in the market, the party that has more access to accurate information on a particular thing to be transacted like a borrower in lending, is well positioned to bargain better terms for the transaction than the other party (in this case, the lender). The lender in this case who knows less about borrowers or about the same particular thing to be transacted can either make right decisions just by chance or wrong decisions regarding the transaction (Committee, 2001).

Generally, customers applying for loans have all information about their financial position and their capacity of loan repayment. However, in most situations while borrowing, they tend not to disclose the truth in order to qualify for more financing than they really deserve. This leads to information asymmetry and moral hazard. Adverse selection and moral hazards have led to significant accumulation of Non- Performing loan in banks (Macharia, 2012).

The significance of the information symmetry theory in the study is that it helps researcher, the audience and managers in commercial banks in particular to understand more deeply how asymmetric information is one of the key factors that can lead to inefficient provision loans which can in turn lead to high levels of defaulting loans and eventually to poor financial performance of the commercial banks. So it stresses that managers of commercial banks have to avoid asymmetric information in their lending operations. To conclude, information asymmetry theory posits that distinguishing good from bad borrowers is difficult.

It tells that credit managers need to spend enough time to learn and know borrowers especially those borrowing huge sums for financing high risks projects like construction of different types of houses. If not, high rate of defaulting loans, can lead to insolvency of the commercial banks and low financial performance in the long run.

2.1.3 The Financial Accelerator Theory

According to HALTON (2023), the financial accelerator theory gives a detailed explanation of how lending and borrowing operations are to a larger extent affected by small economic shocks. This theory is built on how the external finance premium that rise owing to inadequate flow of information and borrowers and lenders and economic agents' net worth are interacted. Economic agents' net worth can be defined as: the sum of liquid assets plus collateral value of illiquid assets minus outstanding obligations; and the external finance premium can be defined as: the difference between the cost of funds raised externally and opportunity costs internal to the firm. The theory posits that in most cases, many borrowers are interested to invest in projects that are riskier. Usually such projects are those that if properly managed have potential to help borrowers generate huge return than low risks investment projects. These projects are preferred from borrowers since the firms' losses in the case when the project's return is low and are limited to zero by legal regulation.

The financial institutions' point of view is that these kinds of high risk and high return propensity projects are very unfavorable because they bear all, or most of, the costs in the case of project poor performance and failure. The theory also posits that owing to some economic shocks, the customers may not be able to borrow and try to avoid loan repayments.

This theory is significant in the study, because it helped understand the reason why most borrowers tend to request loans that are very risky. It warns the managers of lending operations in commercial banks that these high risk projects that include mainly construction of houses projects are very unfavorable to the financial institutions and that they have to be careful in provision of such loans. The theory is most significant again, as it helps to understand immediately how defaults of loans constitute a major shock to the commercial banks and bear directly a negative effect on the financial performance of the project (HALTON, 2023).

2.2 Empirical Review

This part presents a review of empirical studies that touch on how non-performing loans affect financial performance.

2.2.1 Effects of Non-Performing Loans on the economy

There has been renewed interest in the issue of NPLs among researchers due to its influence on banks' lending and profitability as well as the performance of the economy. NPLs give rise to loss-loan provisions that decrease banks' profits and hence their dividends to shareholders (Hippolyte, 2005). They also disturb the flow of credit to borrowers, as funds loaned out are not paid back, either in full or in part. NPLs are also among the signals of banks' failure and can affect macroeconomic performance (Freixas & Rochet, 2008; Waweru & Kalani, 2008). It is argued that banking crises can also drive firms, including viable banks, into bankruptcy because borrowers are unable to service their debt. Therefore, banks' assets drop in value leading to insolvency that ends in banking crises.

According to Gisanabagabo's thesis which delves into the profound impact of Non-Performing Loans (NPLs) on the economy, the ideas that has rekindled the interest of researchers. NPLs, notorious for causing banks to set aside loss-loan provisions, inevitably diminish bank profits and thereby reduce dividends for shareholders (Gisanabagabo, 2017). Furthermore, NPLs disrupt the flow of credit, depriving borrowers of the funds they need for investment and consumption, which, in turn, exerts a dampening effect on economic performance (Detragiache, Asli Demirguc-Kunt and Enrica, 1998).

NPLs also serve as an ominous signal of banking instability and potential failure. They have been linked to financial crises in various parts of the world, such as the banking distress in France and Scandinavia in the early 1990s and the Asian crisis of 1997, which started as a currency crisis in Thailand but swiftly escalated into a full-blown financial crisis. Even more recently, during the global financial crisis of 2007–2009, NPLs played a pivotal role in destabilizing financial institutions and triggering economic turmoil.

Deposit insurance, often seen as a safeguard against banking crises, paradoxically appears to have exacerbated the problem. Instead of instilling confidence, it has led to moral hazard within the banking industry.

Bank managers, secure in the knowledge that depositors are protected, have been emboldened to take excessive risks by lending to high-risk borrowers, resulting in an accumulation of NPLs. The correlation between NPLs and bank failure is undeniable. For instance, in France, where NPLs reached 8.9 percent of total loans in 1994, the government had to intervene with a rescue package. Similarly, the Scandinavian bank crisis in the early 1990s, partly fueled by high NPL ratios, cost billions of dollars. The Asian financial crisis saw a surge in NPLs across the region, presaging the economic turmoil that followed.

Studies have consistently shown that banks with lower asset quality, characterized by higher NPL levels, have a higher likelihood of failure. This pattern was evident in both the East Asian financial crisis and the Latin American crisis of the 1990s.

In the aftermath of escalating NPLs in Thailand, banks saw their intermediation role decline as businesses sought alternative sources of financing, such as corporate bonds or retained earnings. The contagion effect of financial troubles also reached well-capitalized and strong banks, underscoring the systemic risk associated with high NPL levels.

The global financial crisis of 2007–2009, triggered by defaults on sub-prime mortgages, serves as a stark reminder of the destructive power of bad loans. The crisis had far-reaching consequences, including prolonged economic downturns, business closures, plummeting savings, home foreclosures, and mass job losses on a global scale.

Gisanabagabo's research continue painting a vivid picture of how NPLs, far from being a mere financial metric, are integral to the health of the banking sector and the broader economy. Their implications resonate across the spectrum, from shareholder dividends to the livelihoods of ordinary citizens, making them a critical area of study for policymakers and financial institutions alike." (Gisanabagabo, 2017)

"In the context of the United States, the challenges stemming from the global financial crisis of 2007–2009 can be likened to those experienced during the Great Depression of 1929. The Great Depression witnessed a staggering 27 percent decline in real output, accompanied by a stark increase in unemployment, soaring from a mere 3 percent in 1929 to a staggering 25 percent by 1933. During this period, the number of banks dwindled from approximately 30,000 in 1920 to a mere 15,000 in 1933. A staggering 9,000 banks shuttered their doors between 1930 and 1933, inflicting substantial losses upon depositors and shareholders to the tune of an estimated US\$ 2.5 billion (Gans, King, & Mankiw, 2011).

Rural banks, in particular, succumbed to closures due to the high levels of Non-Performing Loans (NPLs) among farmers, who grappled with delayed repayments owing to the low prices of agricultural products.

Furthermore, NPLs exert a pervasive influence on banks and other deposit-taking institutions by denting their profits through mandatory loan loss provisions. This, in turn, impacts the distribution of dividends to shareholders. Additionally, NPLs curtail these institutions' lending capacity, placing constraints on the expansion of credit and indirectly affecting economic growth (Berger & DeYoung, 1997).

The surge in NPLs gives rise to supplementary costs for all financial intermediaries involved in the loan recovery process. These expenses encompass activities such as making phone calls, visiting borrowers experiencing repayment difficulties, and the legal expenses tied to the foreclosure process of collateral pledged by borrowers when obtaining loans, as well as selling these assets in bank auctions. Consequently, banks channel additional resources toward the recovery of non-performing loans. While the factors contributing to the upsurge in NPLs emanate from both external and internal sources within the banking system, this chapter concentrates on the endogenous factors that have a more substantial impact on the fluctuation in NPL levels within the Rwandan banking sector and factors within the purview of bank management that can be mitigated or eliminated.

2.3 Conceptual review

Theoretical review presents and discusses various works related to the concepts of the study. It gives details on determinants of NPL, the Non-Performing Assets, financial performance, and relationship between NPL and financial performance.

2.3.1 The concept of Non-Performing Loans (NPLs)

According to BNR (2015), a loan adhering to pre-established repayment schedules is categorized as non-performing when the principal and interest payments remain unpaid for a duration spanning ninety days or more. Alternatively, a loan earns the classification of non-performing when either the principal or interest payments, equivalent to or exceeding ninety days' worth of interest, have been subjected to capitalization, refinancing, renegotiation, restructuring, or rollover.

In essence, a non-performing loan (NPL) is defined by a blend of qualitative factors revolving around doubts concerning full recoverability and quantitative factors, primarily marked by a delinquency threshold, often set at 90 days, as stipulated by the International Monetary Fund (IMF). To safeguard the stability of the financial sector, central banks adopt stringent regulatory measures to oversee financial institutions, with a particular emphasis on loan management. Commercial banks are subject to regular scrutiny to ensure the rigorous implementation of these regulations.

Financial institutions grapple with the risk of failing to recuperate lent funds, along with associated charges such as interest or other fees, within agreed-upon timeframes. This risk is primarily attributed to factors, some within control and others beyond control, as highlighted by the Federal Deposit Insurance Corporation (2016)."

2.3.1.1 Non-Performing Loans in Bank of Kigali Plc

The Bank of Kigali Plc, a prominent financial institution in Rwanda, is currently grappling with a notable surge in non-performing loans (NPLs). These non-performing loans refer to loans extended by the bank to borrowers that are experiencing difficulties in making timely repayments or meeting their financial obligations. This increase in NPLs indicates a concerning trend where a larger proportion of the bank's loan portfolio is at risk of not being repaid as scheduled. Such a situation can potentially impact the bank's financial health and stability, as it may lead to reduced profitability, strained liquidity, and an overall negative impact on its ability to support the local economy through lending and financial services. The bank likely need to implement robust risk management strategies and engage with borrowers to mitigate these challenges and ensure the soundness of its operations.

2.3.1.2 Impact on Financial Performance:

Profitability: The theory of profitability highlights the negative relationship between NPLs and a bank's profitability. Non-performing loans result in increased provisioning requirements, which reduce a bank's net interest income and overall profitability. Higher levels of NPLs lead to higher credit costs and lower profitability ratios, affecting a bank's financial performance (Makuza, 2018).

Liquidity: The theory of liquidity management suggests that NPLs can have a negative impact on a bank's liquidity position. As defaults increase, banks may face challenges in meeting deposit withdrawals and other obligations, leading to liquidity shortages. Managing NPLs effectively and maintaining sufficient liquid assets are crucial in ensuring a bank's liquidity stability (Kuseh et al., 2020).

Capital Adequacy: The theory of capital adequacy highlights the impact of NPLs on a bank's capital base. As NPLs increase, a bank's capital adequacy ratio may decline, affecting its ability to absorb losses and meet regulatory capital requirements. Higher NPLs require higher provisions, which reduce a bank's capital buffers and can limit its lending capacity (Nyamwasa & Basabose, 2018).

2.3.2 Financial Performance of commercial banks

Profitability indicators were used in the study to measure financial performance of the selected commercial banks. Profitability as a key indicator of the commercial banks' financial performance, it indicates that a bank is well positioned in the market and that there exists high quality management. By profitability is meant the capacity of a business to be successful financially. Most business organizations analyze profitability to make sure that they make decisions that foster their capability to make profit. There are three main circumstances that can be used to describe financial institution's financial situation. Either, it can make profit, break-even or can make a loss. Generally, all commercial banks want to make profit. Profitability the utmost aim of banks in the short and long run. Banks must remain profitable in order to resist negative shock and continue to operate in the long-run. That is why, it is necessary to managers to assess current, future and past profitability levels. While analyzing profitability, there is need to look at both gross profit and net profit. Total sales minus direct cost of goods or services produced whereas for net profit, the formula is deducting general and administrative expenses, depreciation costs and all taxes from its revenue and any other income. The measures of profitability include Return on Assets (ROA) which is calculated by dividing a company's net income by the average total assets, return on Equity (ROE), determined by dividing net income by the average shareholder's equity and Net Profit Margin (NPM) computed by dividing net income by revenues (Scott, 2019).

2.3.2.1 Return on assets (ROA)

High return on asset (ROA) in banking institutions is a great indication of good financial performance. It indicates that the bank is earning more income on less investment. This helps the financial institution to grow exponentially and expand investments. Commercial banks that increased gradually the return on asset performed had potential to provide better services, attract customer base and expand their activities to more geographical locations. High return on asset among many other benefits helps the commercial banks to remain more competitive. Banks with high return on asset, have the potential to provide affordable financial services to the customers in addition to investing in provision of better services. (Ebba, 2016).

Return on asset as a measure of profitability, helps commercial banks to have an idea of the ratio of return on asset they own. Bankers get to know how their businesses are in converting the asset into net income. In calculating the return on asset (ROA), we net income derived from the income statement and total asset obtained from the balance sheet are considered. While comparing banking institutions, a financial institution with high return on asset means that the bank was able to use its various resources efficiently to generate income. It is worth mentioning that the ratio removes the effect of the bank size. In comparative studies, a smaller banking institution can be more efficient than bigger ones since it was able to generate more income for each money of its asset (Claessens & Kodres, 2017).

2.3.2.2 Return on Equity (ROE)

A high return on equity indicates that the commercial bank is increasing its profits without needing much capital. Further it is an indication of how the managers deploy shareholder capital. On the other hand, dropping return on equity indicates that there banking institution is less efficient in managing equity capital. This is a very important criterion for the investors to be convinced to invest their money in a given commercial banks. Commercial banks with high return on equity is more attractive to the investors. It gives credit that the commercial bank is able to generate high return to the shareholders. It is also an indicator that the management of the commercial bank is able to use equity financing to fund bank operations and growth. (Muhammad et al., 2020).

Return on equity ratio is estimated by dividing net income by the shareholders' equity. ROE is a profitability rate from the shareholders' point of view. Investors are interested in high return on equity to be sure that the banking institution is likely to utilize their fund effectively.

Commercial banks calculate return on equity at the end of the year and may choose a given number of years to understand the trend in generation of return and the capacity of the banks to maintain positive earnings growth. These reports are made available to the public in order to attract more investments (Ugoani, 2015).

2.3.2.3 The Loan-to-Deposit Ratio (LDR)

The Loan-to-Deposit Ratio (LDR) is a financial metric that indicates the proportion of a bank's total loans in relation to its total deposits. It is used to assess a bank's lending activities and its ability to cover potential withdrawals by depositors. A higher LDR suggests that a larger portion of a bank's funds is being lent out as loans, potentially leading to increased interest income and profitability. However, a high LDR can also indicate a higher risk level, as it might mean the bank has a lower proportion of liquid assets available to meet depositors' demands. Conversely, a lower LDR signifies that the bank is more conservative in lending, potentially focusing on maintaining liquidity and minimizing risk exposure.

2.3.2.4 Bank size (BS)

Bank size refers to the magnitude or scale of a financial institution, typically measured by its total assets. It reflects the overall value of a bank's holdings, including loans, investments, deposits, and other assets (Hayes, 2022). Bank size is a key determinant of a bank's reach, influence, and potential impact on the financial system. Larger banks often have a broader customer base, offer a wider range of services, and may have more diverse sources of revenue. However, a larger bank might also face challenges related to operational complexity, regulatory requirements, and risk management. Bank size plays a significant role in shaping a bank's strategic decisions, competitive positioning, and ability to generate profits and manage risks effectively.

2.3.2.5 Net Interest Margin (NIM)

A positive net interest margin (NIM) in a commercial bank indicates that it is operating profitably, whereas a negative margin indicates that there is investment inefficiency. In the former situation, a banking institution must take a remedial action by applying funds toward outstanding debt or shifting those assets towards more profitable investments. Further, a positive Net Interest Margin gives credit to the manager that the investment decision was good. The Net Interest margin help managers know the profits the bank has made on investing activities as a proportion of total investing assets. Financial institutions in general use this profitability ratio to analyze the effectiveness of investment decisions made and track how their lending operations are profitable. This is very important because it helps them to make necessary adjustments to maximize their profitability. (Ekanayake and Azeez, 2015).

Banks mobilize deposits from customers and pay them some interest especially for fixed-term deposits. The bank in turn lends this money to other customers to finance their businesses and projects. The NIM now calculates the difference between the sum of interest paid to depositors and the amount of money it makes in lending out the money to other customers. To calculate the net interest margin, in the first place you have to calculate the sum of the investment returns also known as interest income. The commercial bank must have investments and be earning interest on those investments. First and foremost, these returns have to be summed up. Second, interest expenses of the bank are summed up. These are the interest which the bank pays to whom they have borrowed money. The third and last step the bank subtract the interest expenses from total interest income or investment returns. To understand this clearly, let us take an example for one bank, the Net Interest Margin is 8.7 percent. It means that for every \$100 of invested assets mostly loans, the bank made \$9 of income after all interest expenses have been paid to all the banks' lenders. Therefore, it is obvious that the bank made good investment decisions during period X and used its resources effectively. Management made right investment and managerial decisions. Having a positive net interest margin affect management decision, the following year. In such a situation, the bank may decide to charge higher interest rates to the borrowers or pay less interest to the fixed-term depositors. This means thus, that having a good net interest margin gives a competitive advantage to the commercial bank to invest more in quality service and impose its reasonable rates on the customers. (Scott, 2019).

2.3.3 NPLs and Financial Performance

This section covers a discussion of related experiences of financial performance and NPLs from different similar studies conducted in different parts of the globe. Bank managers always need to measure Non-performing loans (NPLs) because they are a real reflection of the credit quality of the loan portfolio, and in general, represent the level of the performance of the loan portfolio of the financial sector of an economy. They quite often need to keep NPL rate at a minimum to ensure that their banking institutions perform well. The lower, the rate of NPL, and the higher the commercial bank performs. The higher the NPL, the lower, the level of financial performance (Ozili, 2019).

2.3.4 Influence of NPLs and Profitability of Commercial Banks

In a study conducted in Pakistan on the relationship between NPLs and profitability, findings revealed that NPL has a negative and substantial impact Profitability of the selected commercial banks. This means that there is a strong effect of Non-Performing Loans on profitability of the commercial banks (Muhammad et al., 2020).

2.3.5 NPLs and Return on Asset

According to Muhammad, et. al. (2020) in their study conducted in Pakistan, it was found out that there is existed a relationship between Return on Asset and Non-Performing Loans. According to Ugoani (2015) there is a relationship between Non-Performing Loans and return on assets (ROA). Non-Performing loans are high, lowers the return on assets and the lower nonperforming loans, the higher the return on asset.

On the other hand, Boudriga et al. (2015) confirmed from their study that there is a negative association between ROA and NPLs. They drew a conclusion that when the ROA decreases, banking institutions start to make investments in high-risk projects, and as a result the level of NPLs increases. In such situations, declining return on asset (ROA) puts pressurizes commercial banks to provide more loans expecting to recover the financial health of the institution. Banking Institutions with a high level of revenue are less involved in perilous investments that can lead to loan defaults in the future which bear a negative effect on profitability and financial performance of the institution. Credit policy does not only help the banking institution to make profit but also to maintain the good public image.

Fannie and Freddie (2019) stated that there is a close association between NPLs and ROA. when the return on asset is low, the rate of nonperforming loans has risen high and when the nonperforming loans decline the return on asset increases. Hue (2015) in her study conducted in Vietnam, made a conclusion that when the growth rate of loans increased, the nonperforming loans and reduced the return on asset for the commercial banks.

Kirui (2015) revealed that nonperforming loans had a negative impact on the profitability of commercial banks in Kenya from 2004 to 2013. Kumar and Kishore (2019) in their study, found out that among the different banking and microeconomic factors return on asset had non-significant relationship with nonperforming loans in the banking system of the UAE.

2.3.6 NPLs and return on equity (ROE)

The research findings of Muhammad, et. al. (2020) showed a strong relationship between NPLs and return on equity among selected commercial banks in Pakistan for the specified study period. The findings are in agreement with the findings of Sean (2020) affirming the influence of NPLs on return on equity.

Non-performing loans affects negatively operating efficiency of the commercial bank. This hinders the capacity of the bank to meet short and long term obligations to their customers as it reduces bank's liquidity and leads to low return on equity. Many commercial banks do not provide loans in some locations as a measure to avoid liquidity risk. But the level of the risk has to be kept in perspective. A commercial bank with sound creditworthiness should not face variabilities in its demand for cash of over 50% of its total assets. In theory, this could mean that up to 50% of its assets could be long term in their maturity without credit risk. This kind of liquidity can be greater for mortgages, either in their ordinary form or in some kind of securities form than for heterogeneous business loans either secured or unsecured by assets that are hard to obtain physical possessions of or to dispose-off. The effective liquidity of long term mortgage loan actually may be strong in an economic crisis than a short term commercial loan (Ozili,2019).

Finally, the level of liquidity of loan can be determined by a number of factors that include the quality of assets and how the financial system is well set. In case of defaulting, low risks assets can be liquidated through direct sale or some moderate premium to compensate for the relative illiquidity (Koju and Wang, 2018).

2.3.8 Banking Capital and NPLs

There is a strong correlation between banking capital and financial performance. On the other hand, this capital is strongly associated with NPLs. This means that high NPL affect capital of the commercial banks. The study conducted by Muhammad, et. al. (2020) revealed that there existed a negative relationship between NPLs banking capital. This means that good performance of loan portfolio eventually results in increasing banking capital.

2.4 Conceptual framework (to be based on one of theories discussed)

A conceptual framework is an analytical research tool intended to assist the researcher to develop awareness and understanding of the concepts under study and to graphically present it (Auronen and Richard, 2013). A conceptual framework is used to make conceptual distinctions and organize ideas. It helps researchers to outline potential courses of action or to present a preferred approach to an idea or thought. It is used to illustrate research findings expected by the researcher. it is a very important tools as it maps out how variables adopted in the study can be relate to each other. In the study, the variables adopted were conceptualized on basis of relevant theories and related studies by different scholars. In this section of conceptual framework stands for the researcher's synthesis of literature by showing how the phenomenon is explained. It put out the actions required during the study by giving its previous awareness and observations pointed out by other researchers.

This is done by understanding the relationship and connection of research variables.

It also shows the concepts identified in demonstrating the relationship between Non-performing loans and financial performance of Bank of Kigali Plc in Rwanda. The reality is that financial performance of Bank of Kigali Plc depends heavily on good management of nonperforming loans issued. In this regards the research tries to see the relationship between non-performing loans and how it affects the performance of commercial banks in Rwanda between 2011 and 2022. The researcher conducts a study on the root cause of non-performing loans, the effect it has on financial performance of commercial banks in Rwanda and strategies to ensure effective management of non-performing housing loans in commercial banks in Rwanda.

Conceptual framework acts as a road map and direction of research undertaking, it also guides the researcher towards his objectives (Adom and Hussein, 2018).

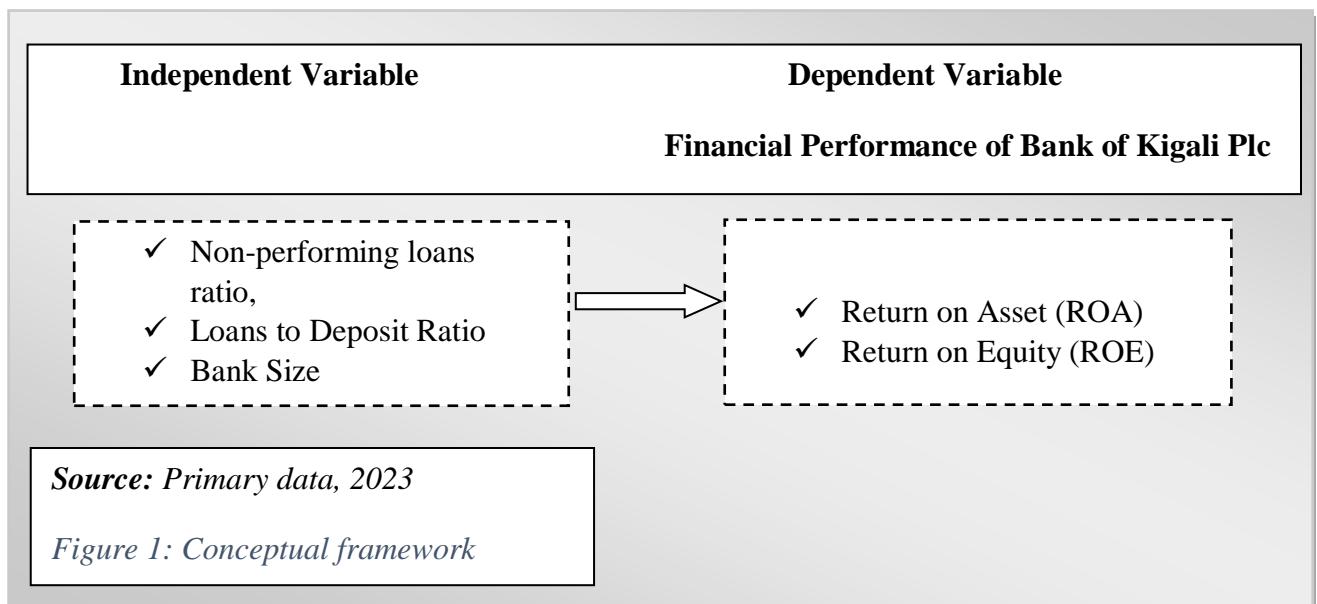
In a case study examining the factors of non-performing loans towards the financial performance of the Bank of Kigali Plc in Rwanda, you would typically have independent variables and a dependent variable. Here's a general understanding of these variables:

Independent Variable: Independent variables, also known as predictor variables or explanatory variables, are the variables in a research study or statistical analysis that are manipulated or controlled by the researcher. These variables are believed to have an impact or influence on the dependent variable, which is the outcome or result being studied. In the context of the given research study on the financial performance of Bank of Kigali Plc, the independent variables are: Non-Performing Loans (NPLs), Loan to Deposit Ratio (LDR), and Bank Size (BS).

Dependent Variables: The dependent variable, also known as the outcome variable or response variable, is the variable that researchers are interested in understanding or predicting based on the values of the independent variables. It represents the effect or the phenomenon being studied in a research investigation. In statistical analysis, the dependent variable is the variable that is measured or observed to assess the impact of changes in the independent variables. the dependent variable in this case are return on assets (ROA) and return on equity (ROE).

It's important to note that the specific independent variables chosen for the case study depend on the research objectives, available data, and the relevant literature in the field. Careful consideration should be given to selecting variables that have theoretical grounding and empirical support in the context of non-performing loans and financial performance in the banking industry.

Conceptual framework figure



This study was carried out with the objective of finding out whether the financial performance and non-performing loans in Bank of Kigali Plc located in Rwanda has been related by using performance as well as to test the existence of the relationship between the Capital adequacy, Asset Quality, Management efficiency, and Liquidity with the profitability measures.

In the context of the study, dependent variable is the financial performance of Bank of Kigali Plc; its complements are loans and total loans while independent variable is total non-performing loans and total non-performing loans. The researcher wants to find out how non-performing loans has affected financial performance of Bank of Kigali Plc between the year 2011 and 2022. Also find out the relationship between independent and dependent variables using regression analysis. The R-Squared (Which is the coefficient of correlation) help the research to confirm the findings.

2.5 Operational Definition of Terms

This section presents definition what the terms mean operationally in the study.

Definitions of dependent and independent variables under study are given as follows.

Non-Performing Loans (NPLs): These are loans that have not been serviced by borrowers according to the agreed-upon terms and conditions, usually defined as loans with principal or interest payments overdue for a specific period. NPLs indicate the credit risk faced by a bank and can negatively impact its financial performance and overall stability.

Financial Performance: Refers to the assessment and evaluation of a bank's financial health and profitability. It involves measuring various financial indicators and ratios, including but not limited to, net interest margin, return on assets (ROA), return on equity (ROE), cost-to-income ratio, capital adequacy ratio (CAR), and asset quality.

Return on Assets (ROA): ROA is a financial ratio that measures a company's profitability by evaluating how effectively it utilizes its assets to generate earnings. It is calculated by dividing the net income of a company by its average total assets. ROA indicates the efficiency of asset utilization and provides insights into the company's ability to generate profits from its investments.

Return on Equity (ROE): ROE is a financial ratio that measures the profitability of a company in relation to its shareholders' equity. It is calculated by dividing the net income of a company by its average shareholders' equity. ROE shows how effectively a company generates profits from the capital invested by its shareholders. It is a key metric for evaluating the company's profitability from the perspective of equity shareholders.

This helps the bank to control risks and overcome easily short-term problems. the study adopted only two main indicators of profitability namely return on asset (ROA), return on equity (ROE).

The Loan-to-Deposit Ratio (LDR): is a financial metric used by banks to assess their lending activities. It measures the proportion of a bank's total loans to its total deposits, indicating how much of its available funds are being utilized for lending. A higher LDR suggests a greater focus on lending, potentially leading to increased interest income and risk exposure.

Bank Size (BS): refers to the magnitude or scale of a financial institution, typically measured by its total assets. It reflects the overall value of a bank's holdings, including loans, investments, deposits, and other assets. Larger bank size can indicate greater reach, influence, and potential impact on the financial system.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This section outlines the data methodology used to assess effects of NPLs on the financial performance of Bank of Kigali Plc in Rwanda. The data methodology describes the sources of data, collection techniques, variables considered, and analytical methods.

3.2 Research Design

A specific point in time is used to assess effect of NPLs on the Financial performance of Bank of Kigali Plc. This design was adopted to ensure proper representation of Bank of Kigali Plc since most of the studies done previously were sector specific or panel based. This research design was determined by the research questions, categories of data needed, the source of the data and the availability of the data. Furthermore, the research will use time series data from financial statement in annual reports of Bank of Kigali Plc.

3.3 Population and Study Sample

Mugenda and Mugenda (2003) defined the population as the number which the researcher wishes to generalize the results on. In the case of the current research the population is made of commercial banks in Rwanda with Bank of Kigali Plc serving as sample. Bank of Kigali Plc has been chosen due to its market share in the banking industry that is above 30% and the likelihood to get easily data from their comprehensive Financial statement reports on its website..

3.3.1 Data Sources

Secondary Data: Secondary data refers to existing data collected by other researchers, institutions, or organizations. In the study, secondary data sources used is from the financial statements in annual reports of Bank of Kigali Plc.

3.3.2 Data Collection Techniques

Documentations: This technique is used to gather relevant data for your case study of Bank of Kigali Plc. This may include financial reports, loan portfolios, NPL data, profitability metrics, economic indicators, and any other relevant information. Make sure the data is reliable and up-to-date, covering the period from 2011 to 2022.

3.3.3 Data Analysis method

After data collection, the results were presented and analyzed using tabulations and graphs to explore the relationship between non-performing loans (NPLs) and the financial performance of Bank of Kigali Plc. The analysis involved conducting a regression analysis to assess the impact of three independent variables on the dependent variable.

1. Dependent Variable:

The dependent variable in the study are;

- a) **Return on Equity (ROE):** Which indicates how effectively the bank is using its shareholders' funds to generate earnings.
- b) **Return on Assets (ROA):** Which measures the bank's ability to generate profits from its average total assets and provides insight into the bank's efficiency in utilizing its assets to generate earnings.

2. Independent Variables:

The independent variables affecting the dependent variables (ROA and ROE) are:

- a) **Non-Performing Loan (NPL) Ratio:** Which is a crucial indicator of a bank's credit risk and asset quality and represents the percentage of non-performing loans (loans that are not being repaid on time or are in default) in relation to the total loan book, excluding loans to other banks.
- b) **Loan to Deposit Ratio (LDR):** Which shows the proportion of a bank's total loans (including advances and credits) to its total deposits.
- c) **Bank Size (BS):** Which measures the scale or total assets of Bank of Kigali Plc and is often used as a control variable to account for the size-related effects on the financial performance of the bank.

3.4 Model Equation Specification

The regression equation used to determine the relationship between NPL and the financial performance of Bank of Kigali Plc is as follows:

$$Y = f(X1, X2, X3) + \varepsilon \dots\dots\dots (3.1)$$

$$Y = \alpha + \beta1*X1 + \beta2*X2 + \beta3*X3 + \varepsilon \dots\dots\dots (3.2)$$

Where:

- Y represents the dependent variable.
- X1, X2 and X3 represents the independent variables.
- α , $\beta1$, $\beta2$, and $\beta3$ are coefficients, and ε is the error term.

In the proposed model, the aim is to assess the relationship between Return on Equity (ROE) and Return on Assets (ROA) with three independent variables: Non-Performing Loans (NPLs), Loan to Deposit Ratio (LDR), and Bank Size (BS). The model equations are:

$$ROE = f(NPLs, LDR, BS) \dots\dots\dots (3.3)$$

$$ROA = f(NPLs, LDR, BS) \dots\dots\dots (3.4)$$

The dependent variables are ROE and ROA, representing the bank's financial performance, while the independent variables are NPLs, LDR, and BS, representing factors that may influence the financial performance.

The model's representations are as follows:

3.4.1 ROE Model:

The study uses a regression analysis with ROE as the dependent variable and NPLs, LDR, and BS as independent variables. The regression equation is:

$$ROE = \alpha + \beta1*NPLs + \beta2*LDR + \beta3*BS + \varepsilon \dots\dots\dots (3.5)$$

where:

- ROE represents the Return on Equity of Bank of Kigali Plc.
- NPLs represent the Non-Performing Loans of Bank of Kigali Plc.

- LDR represents the Loan to Deposit Ratio of Bank of Kigali Plc.
- BS represents the Bank Size of Bank of Kigali Plc.
- α , β_1 , β_2 , and β_3 are coefficients, and ε is the error term.

3.4.2 ROA Model:

Similarly, the study provides a regression analysis with ROA as the dependent variable and NPLs, LDR, and BS as independent variables. The regression equation is:

$$ROA = \alpha + \beta_1 * NPLs + \beta_2 * LDR + \beta_3 * BS + \varepsilon \dots\dots\dots (3.6)$$

where:

- ROA represents the Return on Assets of Bank of Kigali Plc.
- NPLs represent the Non-Performing Loans of Bank of Kigali Plc.
- LDR represents the Loan to Deposit Ratio of Bank of Kigali Plc.
- BS represents the Bank Size of Bank of Kigali Plc.
- α , β_1 , β_2 , and β_3 are coefficients, and ε is the error term.

The researcher used the statistical software E-VIEWS to perform the regression analysis, to estimate the coefficients (β_1 , β_2 , and β_3) and assess their significance. The significance tests help to determine if each independent variable has a statistically significant impact on the financial performance indicators (ROE and ROA) of Bank of Kigali Plc. The significance level was determined using appropriate tests. Before analysis of data, the researcher took time to check if every data was well captured into the software, and mistakes were corrected.

It is essential to clarify that the data used in the study is secondary, and no tests of validity or reliability were conducted since the researcher did not collect the data. Instead, the researcher relied on available data sources for analysis.

3.5 Analytical Methods:

Descriptive Analysis: Descriptive statistical analysis was employed to summarize the collected data, presenting key statistics and trends related to NPLs and financial performance. This analysis provides an overview of the data and highlights any patterns or relationships.

Inferential Analysis: Inferential statistical techniques, such as regression analysis, can be used to examine the relationship between independent variables such as NPLs, loan to deposit ratio and bank size influence the dependent variables (financial performance indicators). Regression analysis helps identify the significance and magnitude of the impact of each independent variable on financial performance.

The study involves the collection of secondary time series data to assess effects of NPLs on the financial performance of Bank of Kigali Plc in Rwanda.

By conducting a case study of Bank of Kigali Plc, one of the leading banks in Rwanda, the study aims to provide valuable insights and recommendations to the bank and the Rwandan banking sector as a whole. The findings can inform policymakers, regulators, and other banks in formulating strategies to manage NPLs effectively, enhance loan portfolio quality, and improve financial performance.

The background of the study highlights the significance of understanding the factors influencing non-performing loans and their impact on the financial performance of Bank of Kigali Plc in Rwanda. By conducting a case study of Bank of Kigali Plc, the research aims to provide valuable insights and recommendations to enhance the bank's performance and contribute to the management of NPLs in the Rwandan banking sector.

CHAPTER FOUR: RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

This section presents analysis of the results in relation to the models specified in chapter three. It also accounts for the research problem, stated objectives, and hypothesis established in the first and second chapters. The chapter begins with presentation of descriptive and correlation analysis of variables of interest and concludes on the results and interpretation of the analysis.

The findings of the empirical analysis are presented, shedding light on the effects of non-performing loans (NPLs) on the financial performance of Bank of Kigali Plc. The analysis focuses on key financial indicators and their correlation with NPL ratio over a defined period. Where ROA stands for Return on Assets, ROE stands for Return on Equity, SERNPL Stands for non-performing loans ratio and LOGBS stands for Bank Size in the image used from Eview-12 software.

4.2 Descriptive Analysis

This section describes an overview of observations made from the study. The maximum and minimum values, mean as well as the standard deviations of the variables have been described in this section. Dependent and independent variables were selected and statistically observed. The table below gives a brief summary of results of the variables used in the study.

Figure 2: Summary of Descriptive statistics for first model (ROA)

	ROA	LDR	SERNPL	LOGBS
Mean	3.666667	87.46667	33.88333	6.563515
Median	3.600000	89.25000	27.20000	6.524005
Maximum	4.000000	104.2000	69.70000	7.470737
Minimum	3.300000	65.30000	10.90000	5.662613
Std. Dev.	0.257023	13.04791	22.37937	0.598278
Skewness	0.084505	-0.324076	0.611083	0.058507
Kurtosis	1.439778	1.820710	1.790194	1.857597
Jarque-Bera Probability	1.231429 0.540255	0.905413 0.635905	1.478660 0.477434	0.659389 0.719143
Sum	44.00000	1049.600	406.6000	78.76218
Sum Sq. Dev.	0.726667	1872.727	5509.197	3.937304
Observations	12	12	12	12

Source: E-views Software

The descriptive analysis of Bank of Kigali Plc's financial performance spanning from 2011 to 2022, several key indicators were assessed. The Return on Assets (ROA) had an average value of 3.66%, indicating a healthy financial performance. This was further supported by the ROA's minimum value of 3.3% and a maximum of 4.0%. Conversely, Non-Performing Loans (NPL) averaged 33.88%, with a minimum of 10.9% and a maximum of 69.7%, reflecting a range of loan quality within the bank. The Loan to Deposit Ratio, at an average of 87.46%, exhibited a balance between loans and deposits, with a minimum of 65.3% and a maximum of 104.2%. Lastly, the log of Bank Size had an average of 6.56%, ranging from a minimum of 5.66% to a maximum of 7.47%. These findings provide insights into Bank of Kigali's financial performance, with ROA indicating positive signs, NPL showing potential areas for improvement, and other metrics offering valuable context for the bank's operations during the specified period.

Figure 3: Summary of Descriptive statistics for first model (ROE)

	ROE	LDR	SERNPL	LOGBS
Mean	19.52500	87.46667	33.88333	6.563515
Median	19.30000	89.25000	27.20000	6.524005
Maximum	22.90000	104.2000	69.70000	7.470737
Minimum	16.00000	65.30000	10.90000	5.662613
Std. Dev.	2.034755	13.04791	22.37937	0.598278
Skewness	0.081841	-0.324076	0.611083	0.058507
Kurtosis	2.276799	1.820710	1.790194	1.857597
Jarque-Bera Probability	0.274906 0.871575	0.905413 0.635905	1.478660 0.477434	0.659389 0.719143
Sum	234.3000	1049.600	406.6000	78.76218
Sum Sq. Dev.	45.54250	1872.727	5509.197	3.937304
Observations	12	12	12	12

Source: *E-views Software*

The descriptive analysis of Bank of Kigali Plc's financial performance during the period from 2011 to 2022, several key indicators were examined. The Return on Equity (ROE) had an average value of 19.52%, signifying strong financial performance. This is supported by the ROE's minimum value of 16.0% and a maximum of 22.9%. On the other hand, Non-Performing Loans (NPL) averaged 33.88%, with a minimum of 10.9% and a maximum of 69.7%, indicating potential areas for improvement in loan quality. The Loan to Deposit Ratio, with an average of 87.46%, reflects a balanced relationship between loans and deposits, ranging from a minimum of 65.3% to a maximum of 104.2%. Lastly, the log of Bank Size showed an average of 6.56%,

varying from a minimum of 5.66% to a maximum of 7.47%. These findings provide valuable insights into Bank of Kigali's financial performance, with ROE signaling positive results, NPL suggesting potential challenges, and other metrics offering important context for the bank's operations during the specified period.

4.3 Correlational Analysis

The commonest used and reported statistical methods is correlation analysis. It summarizes scientific research data. It is frequently used in determining the existence of relationship between and among two or more dissimilar variables. The correlation analysis indicates the strengths and weaknesses of the relations that exist between or among the variables (Taylor, 1990).

Figure 4: Correlation Analysis of the variables (ROE)

Correlation t-Statistic Probability	ROE	LDR	SERNPL	LOGBS
ROE	1.000000 ----- -----			
LDR	-0.636312 -2.608391 0.0261	1.000000 ----- -----		
SERNPL	-0.546944 -2.065994 0.0657	0.666104 2.824131 0.0180	1.000000 ----- -----	
LOGBS	-0.407905 -1.412788 0.1881	0.720355 3.284236 0.0082	0.946492 9.274264 0.0000	1.000000 ----- -----

Figure 5: Correlation Analysis of the variables (ROA)

Correlation t-Statistic Probability	ROA	LDR	SERNPL	LOGBS
ROA	1.000000 ----- -----			
LDR	-0.549296 -2.078706 0.0643	1.000000 ----- -----		
SERNPL	-0.545370 -2.057529 0.0667	0.666104 2.824131 0.0180	1.000000 ----- -----	
LOGBS	-0.513612 -1.892939 0.0876	0.720355 3.284236 0.0082	0.946492 9.274264 0.0000	1.000000 ----- -----

Source: E-views Software

Correlation analysis of independent variable with dependent variable can be found. Independent variables LDR, NPL and Bank Size are negatively related with dependent variable ROA and ROE. Negative association between bank performance and NPL also found by (Etale. L, Ayunku & Etale. E, 2016), (Ozurumba,2016) and (Balango and Rao,2017). Negative correlation opines an increase in the independent variable causes dependent variable to decrease and vice versa.

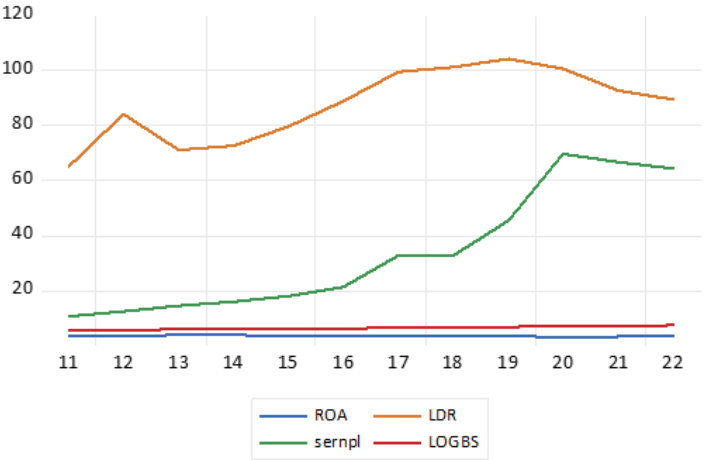
4.4 The Relationship between Return On Equity or Return On Asset, Loan and Deposit Ratio, Non-performing Loans and Bank Size

4.4.1 The Relationship between Return On Asset, Loan and Deposit Ratio, Non-performing Loans and Bank Size

The relationship between Return On Assets (ROA) and Loan-to-Deposit Ratio (LDR) is complex. A higher LDR, indicating more lending relative to deposits, can potentially lead to increased interest income and higher ROA. However, this may also amplify risk due to potential non-performing loans, impacting ROA negatively. The connection depends on factors like interest rates, credit quality, and economic conditions, influencing how the risk-return tradeoff manifests. And that of Return On Assets (ROA) and Non-Performing Loans (NPLs) is inverse. Elevated NPL levels signify credit quality deterioration, leading to increased credit losses, which in turn reduce profitability and ROA. A higher proportion of NPLs can strain a bank's financial health, affecting its ability to generate earnings from its assets. Addressing NPLs is crucial for maintaining a healthy ROA and overall stability. Lastly, the relationship between Return On Assets (ROA) and Bank Size can vary. Larger banks might benefit from economies of scale, potentially improving ROA. However, complexity in operations could offset gains. The impact depends on effective management strategies and the balance between efficiency and risk in larger institutions (Anayochukwu, 2016).

Below there is a graph which shows the relationship between Return On Asset, Loan and Deposit Ratio, Non-performing Loans and Bank Size of Bank of Kigali Plc from 2011 up to 2022

Figure 6: Relationship between Return On Asset, Loan and Deposit Ratio, Non-performing Loans and Bank Size



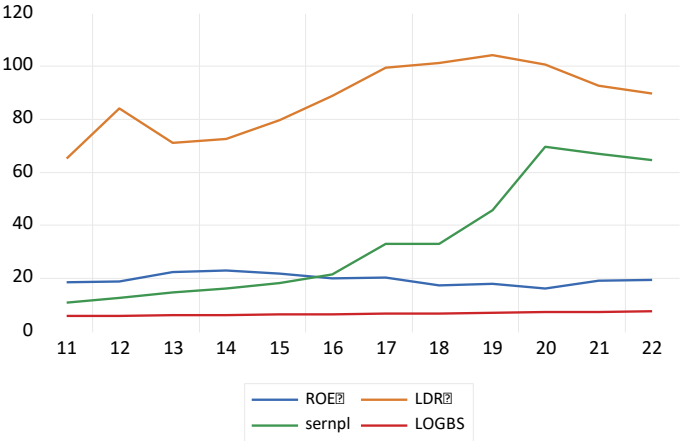
Source: E-views Software

4.4.2 The Relationship between Return On Equity, Loan and Deposit Ratio, Non-performing Loans and Bank Size

The relationship between Return On Equity (ROE) and Loan-to-Deposit Ratio (LDR) is intricate. A higher LDR can boost interest income and ROE, but it also heightens the risk of non-performing loans, which could dampen ROE. Effective risk management is vital to strike a balance between higher returns and potential credit risk in maintaining a favorable ROE. And the connection between Return On Equity (ROE) and Non-Performing Loans (NPLs) is significant. Higher NPL levels often lower profitability and hinder efficient capital utilization, leading to reduced ROE. Managing NPLs effectively through credit risk mitigation strategies is crucial for sustaining a healthy ROE and demonstrating sound financial performance. Lastly, the relationship between Return On Equity (ROE) and Bank Size can be intricate. Larger banks might access diverse revenue streams, positively influencing ROE. However, management challenges and regulatory complexities could limit gains. Successful navigation of size-related advantages and risks determines the impact on ROE (Anayochukwu, 2016).

Below there is a graph which shows the relationship between Return On Equity, Loan and Deposit Ratio, Non-performing Loans and Bank Size of Bank of Kigali Plc from 2011 up to 2022

Figure 7: Relationship between Return On Equity, Loan and Deposit Ratio, Non-performing Loans and Bank Size



Source: E-views Software

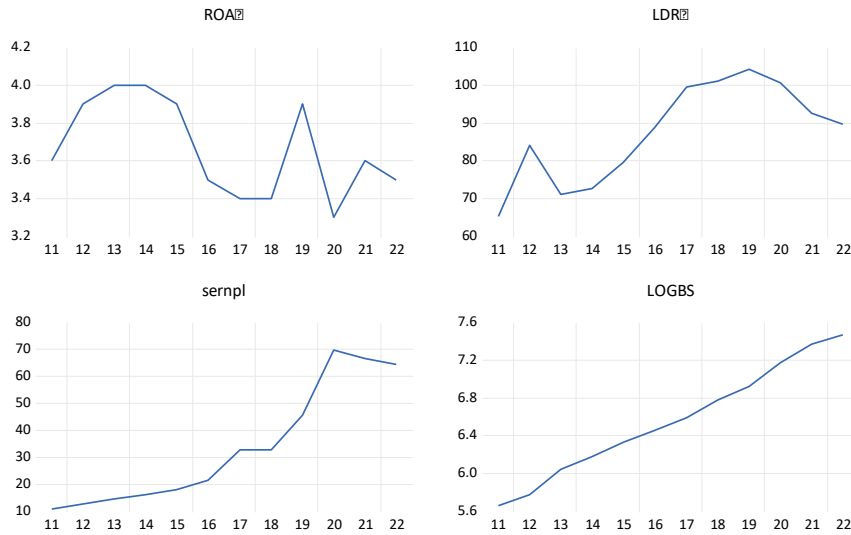
4.4.3 Multiple line graph for Return On Asset or Return On Equity, Loan and Deposit Ratio, Non-performing Loans and Bank Size

Multiple line graphs, also known as line charts or line plots, are an essential data visualization tool for conveying relationships, trends, and patterns in datasets with multiple variables or categories.

Based on our variables, multiple line graphs are vital for enabling simultaneous comparison of trends in multiple variables, helping identify similarities and differences, Patterns among lines showcase potential correlations or causal connections between variables, to display complex data, aiding in clear and efficient communication of insights, the Ideal for tracking changes over time, facilitate temporal analysis and dynamic trend identification, and also provide a foundation for data-driven decision-making by highlighting key data relationships and trends.

Below there are graph which shows multiple line graphs between Return On Asset, Loan and Deposit Ratio, Non-performing Loans and Bank Size of Bank of Kigali Plc from 2011 up to 2022

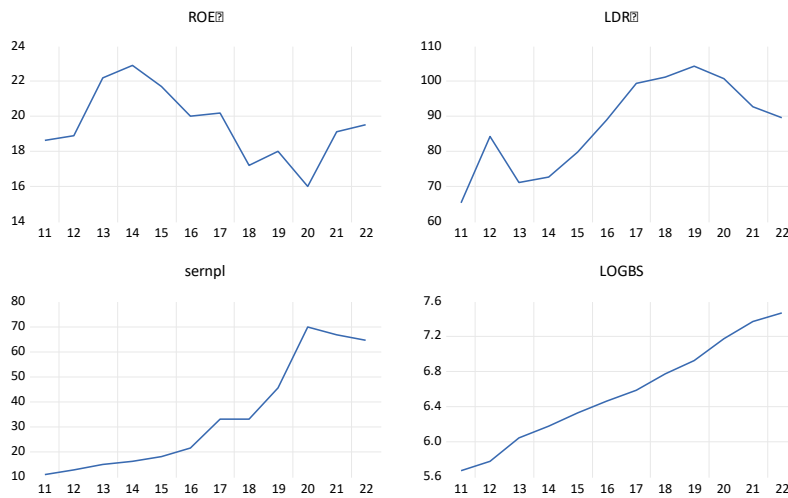
Figure 8: Multiple line graph for Return On Asset, Loan and Deposit Ratio, Non-performing Loans and Bank Size



Source: E-view Software

Also Below there are graph which shows multiple line graphs between Return On Equity, Loan and Deposit Ratio, Non-performing Loans and Bank Size of Bank of Kigali Plc from 2011 up to 2022

Figure 9: Multiple line graph for Return On Equity, Loan and Deposit Ratio, Non-performing Loans and Bank Size



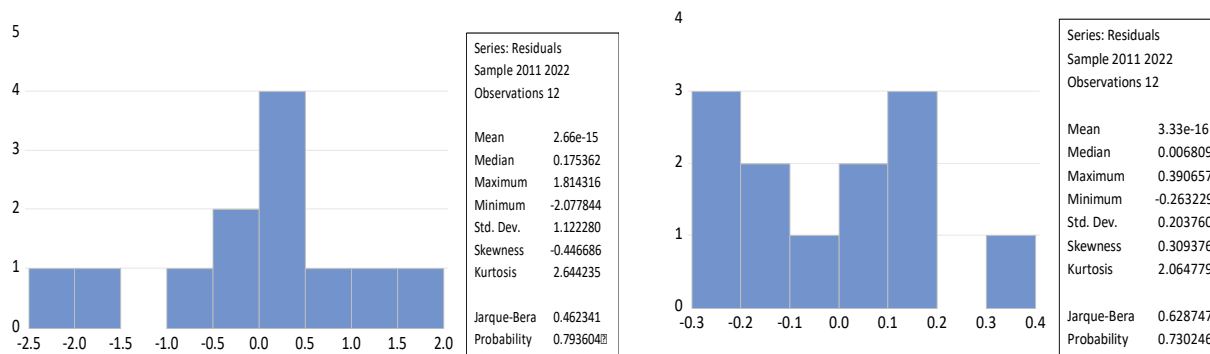
Source: E-views Software

4.5 Classical Assumption Test

4.5.1. Normality test

Normality tests are used to assess whether the data in a sample or dataset follows a normal distribution. A normal distribution (also known as a Gaussian distribution or bell curve) is a common statistical distribution with several important properties, such as symmetry around the mean and a well-defined mean and standard deviation

Figure 10: Normality test Results



Source: E-views Software

The decision criteria for the normality test can be seen by comparing the calculated Jarque-Bera probability value with the alpha level (α) used, which is equal to 0.05.

Decision making hypothesis:

H0: If the Jarque-Bera probability value is greater than 0.05, it can be concluded that the residuals are normally distributed.

H1: If the Jarque-Bera probability value is greater than 0.05, it can be concluded that the residuals are not normally distributed.

Based on Figure above, the normality test conducted by the researcher resulted in a Jarque-Bera probability value of 0.628747 and 0.462341, this result is greater than 0.05, meaning we fail to reject null hypothesis (H0). Therefore, it can be concluded that the residuals are normally distributed in the model are met.

4.5.2 Homoskedasticity Test

A homoskedasticity test is a statistical procedure used to determine whether the variance of the errors (or residuals) in a regression model is constant across all levels of the independent variables. In simpler terms, it checks whether the spread or dispersion of the residuals is the same throughout the range of predicted values. The term "homoscedasticity" is derived from "homogeneous" (meaning uniform or consistent) and "heteroscedasticity" (indicating non-uniform or changing variance).

This test helps to assess whether the assumption of constant variance holds for the residuals of your regression model. If the test indicates that the assumption is met, it suggests that the model's errors have the same variance across all levels of the independent variables. On the other hand, if the test suggests the presence of heteroscedasticity, it implies that the variance of the errors changes as the values of the independent variables change.

Figure 11: Homoskedasticity Test Results

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
Null hypothesis: Homoskedasticity			
F-statistic	0.490719	Prob. F(3,8)	0.6984
Obs*R-squared	1.865034	Prob. Chi-Square(3)	0.6009
Scaled explained SS	0.681457	Prob. Chi-Square(3)	0.8776

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
Null hypothesis: Homoskedasticity			
F-statistic	0.806195	Prob. F(3,8)	0.5249
Obs*R-squared	2.785696	Prob. Chi-Square(3)	0.4259
Scaled explained SS	0.659144	Prob. Chi-Square(3)	0.8828

Source: *E-views Software*

The result of Breusch Pagan Godfrey test which aims to test the homoskedasticity test shows that both models result have a higher p-value than the critical value, which means that there is not enough evidence to reject the null hypothesis. This suggests that the data does not provide strong support for the presence of heteroscedasticity, and then the assumption of homoscedasticity is met. Which means that the variance of the error term in the both regression models is constant.

4.5.3 Serial Correlation Test

Serial correlation, also known as autocorrelation, refers to the correlation between a variable and its past values in a time series dataset. In simpler terms, it's the degree to which the current value of a variable is related to its previous values.

Figure 12: Serial Correlation Test Results

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

F-statistic	1.264420	Prob. F(2,6)	0.3482
Obs*R-squared	3.558056	Prob. Chi-Square(2)	0.1688

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

F-statistic	0.102903	Prob. F(2,6)	0.9038
Obs*R-squared	0.397963	Prob. Chi-Square(2)	0.8196

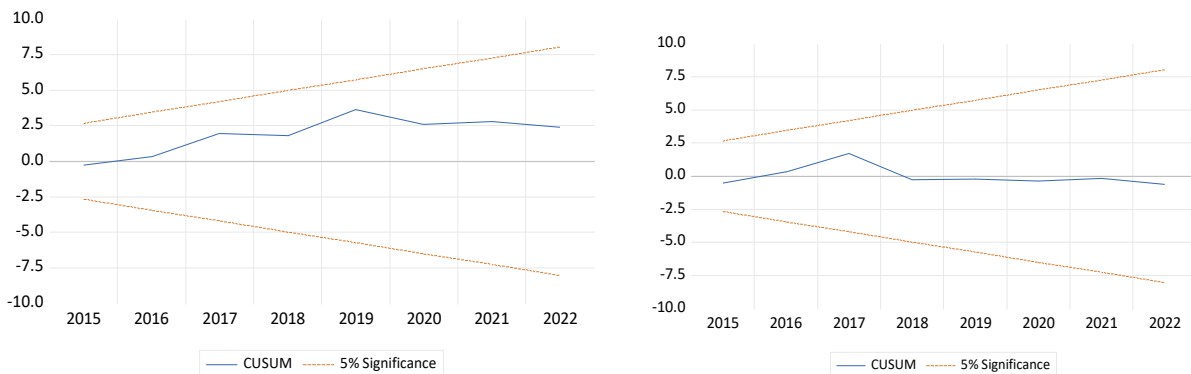
Source: E-views Software

For both models, the existence of serial autocorrelation was tested based on the "Breuch-Godfrey" test. According to the statistical report, since the Prob (F-statistic) is greater than the critical value in both models (0.3482 and 0.9038 > 0.05), then the hypothesis of not having autocorrelation in the model is confirmed. And as serial correlation is not present, this means that each error or residual do not depends on the previous residual.

4.6 Stability test

Stability tests, are used to assess whether a statistical model remains stable over time or across different segments of data. These tests are particularly important in various fields, including quality control, process monitoring, and financial analysis.

Figure 13: Stability test Result



Source: E-views Software

Based on the analysis of the CUSUM plot, there is a Stability as The CUSUM of coefficients plot remains relatively flat and close to zero, this suggests that the coefficient of Return On Equity (ROE) and Return On Asset (ROA) is stable over time. This implies that the effect of Return On Equity (ROE) and Return On Asset (ROA) on Loan to Deposit Ratio (LDR), Non-Performing Loan (NPL) and Bank Size (BS) is consistent across the study period, and there are no significant shifts or changes.

4.7 Multiple Regression Analysis

4.7.1 Analysis of factors affecting ROA

Return on Assets (ROA) is a widely used financial performance indicator that measures a bank's ability to generate profit relative to its total assets. A higher ROA indicates better efficiency in utilizing assets to generate earnings.

The analysis employs a regression model to assess the relationship between ROA and the independent variables (LDR, NPL, and Bank Size). The financial data from Bank of Kigali Plc's annual reports and financial statements over a defined period are used for this analysis. The model aims to determine whether LDR, NPL, and Bank Size significantly influence ROA.

1. Estimation Command:

The command indicates a linear regression analysis, where we're estimating the dependent variable ROA (Return on Equity) using the independent variables LDR (Loan-Deposit Ratio), NPL (Non-Performing Loans) proxied by SERNPL, LOGBS (Log of Bank Size), and a constant term (C).

Figure 14: Regression test Result (ROA)

Dependent Variable: ROA
Method: Least Squares
Date: 08/08/23 Time: 13:11
Sample: 2011 2022
Included observations: 12

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LDR	-0.007746	0.007980	-0.970695	0.3601
SERNPL	-0.007213	0.009999	-0.721402	0.4912
LOGBS	0.156429	0.402207	0.388926	0.7075
C	3.561870	2.149209	1.657293	0.1360
R-squared	0.371516	Mean dependent var		3.666667
Adjusted R-squared	0.135834	S.D. dependent var		0.257023
S.E. of regression	0.238930	Akaike info criterion		0.235905
Sum squared resid	0.456699	Schwarz criterion		0.397541
Log likelihood	2.584567	Hannan-Quinn criter.		0.176062
F-statistic	1.576346	Durbin-Watson stat		2.093462
Prob(F-statistic)	0.269398			

Source: E-views Software

2. Estimation Equation:

$$\text{ROA} = C (1) + C (2) * \text{LDR} + C (3) * \text{NPL} + C (4) * \text{LOGBS} \dots\dots\dots (4.1)$$

This equation represents the linear relationship that's being estimated. The ROA is expressed as a linear combination of the three independent variables (LDR, NPL, LOGBS) with their corresponding coefficients (C2, C3, C4), along with a constant term (C1).

3. Substituted Coefficients:

The regression results for the model

$$\text{ROA} = 3.561870 - 0.007746 * \text{LDR} - 0.007213 * \text{NPL} + 0.156429 * \text{LOGBS} \dots\dots\dots (4.2)$$

Have revealed non-significant coefficients which suggests that the independent variables the model may not be strongly associated with the dependent variable. In other words, the model may not effectively explain the variation in the data. This outcome underscores the complex nature of the relationship between non-performing loans and financial performance indicators within the specific setting of Bank of Kigali Plc as measured by Return on Assets.

The non-significance of these coefficients may be attributed to several factors. First and foremost, our dataset is characterized by a relatively limited sample size, which could limit the statistical power needed to detect subtle effects. Furthermore, the intricate interplay of various macroeconomic and microeconomic variables in the Rwandan financial landscape might be influencing the observed results. It's crucial to acknowledge that statistical non-significance does not necessarily imply the absence of a true relationship; rather, it underscores the challenge of precisely quantifying the impact of non-performing loans on Bank of Kigali Plc's financial performance within the confines of our data.

These findings beckon for a cautious interpretation. While the lack of statistical significance may temper our ability to draw definitive conclusions, the insights derived from this analysis provide valuable groundwork for future research. Additionally, the case study approach offers a unique lens into the complexities faced by Bank of Kigali Plc, shedding light on potential contextual factors that might not be fully captured in the model. Moving forward, it is recommended to consider expanding the dataset and exploring more sophisticated modeling techniques to unravel

the intricate dynamics between non-performing loans and financial performance, contributing to a deeper understanding of the Rwandan banking sector's nuances.

Regression Analysis Results

The regression analysis yielded the following findings:

Loan-to-Deposit Ratio (LDR)

The analysis shows a negative relationship with ROA, although the relationship was not statistically significant. This suggests that as the Loan-to-Deposit Ratio increases, ROA tends to decrease. This finding might imply that a higher concentration of loans relative to deposits could lead to reduced profitability due to increased credit risk exposure.

In line with the theories

Credit default theory in banks does not inherently dictate a negative relationship between Loan-to-Deposit Ratio (LDR) and Return on Assets (ROA). The outcome depends on various factors, including risk management practices, economic conditions, and diversification of the loan portfolio. A high LDR may signify a bank's reliance on lending, potentially increasing credit risk. However, effective risk mitigation strategies, prudent lending practices, and robust credit assessment mechanisms can counteract these risks, maintaining or even improving ROA. In contrast, information asymmetry theory suggests that when there's an imbalance of information between borrowers and lenders, particularly in high LDR scenarios, there can be a negative relationship with ROA, as riskier lending decisions may lead to more defaults. Similarly, financial accelerator theory posits that a high LDR, coupled with external funding reliance, can make banks more susceptible to economic shocks, potentially resulting in increased defaults and higher funding costs, negatively impacting ROA. Therefore, the relationship between LDR and ROA varies depending on the effectiveness of risk management and external factors.

Non-Performing Loans (NPL)

The results demonstrated a negative relationship between NPL and ROA, although the relationship was not statistically significant. Which indicate that as the proportion of NPLs in the bank's loan portfolio increases, ROA decreases. This finding highlights the adverse impact of non-performing loans on the bank's ability to generate earnings and indicates the importance of effective NPL management.

In line with the theories

Credit default theory, information asymmetry theory, and financial accelerator theory all relate to the negative impact of Non-Performing Loans (NPLs) on a bank's Return on Assets (ROA). In each theory, NPLs are seen as indicators of credit risk, reflecting higher instances of borrower defaults, which, in turn, can erode a bank's profitability and lead to a lower ROA. These theories underscore the vital role of effective credit risk management, prudent lending practices, and robust risk assessment mechanisms in mitigating the adverse effects of NPLs on a bank's financial performance. Moreover, they emphasize the need for proactive measures, such as capital buffers and risk diversification, to safeguard ROA, especially during economic downturns or when information imbalances exist between lenders and borrowers.

Bank Size

Bank Size, measured by total assets, was found to have a positive relationship with ROA, although the relationship was not statistically significant. This suggests that larger banks might have a slight advantage in generating higher ROA, potentially due to economies of scale or broader market presence.

In line with the theories

Credit default theory, information asymmetry theory, and financial accelerator theory all converge in suggesting that a direct positive relationship between bank size and Return on Assets (ROA) is not a straightforward or inherent outcome. While larger banks may enjoy advantages like economies of scale and diversification, they also encounter complexities and risk management challenges that can impact their ROA negatively. The interplay between bank size and ROA is intricate and context-dependent, shaped by factors such as operational efficiency, risk management proficiency, and market dynamics. These theories underscore the need for banks, regardless of size, to navigate these complexities and adapt strategies to enhance ROA while effectively managing risks and information disparities.

The findings emphasize the importance of managing Loan-to-Deposit Ratios and Non-Performing Loans to maintain or improve ROA. Banks with a higher concentration of loans relative to deposits or a significant proportion of non-performing loans in their portfolio could face challenges in sustaining profitability. The positive but insignificant relationship between

Bank Size and ROA suggests that while larger banks might have certain advantages, other factors could also influence their financial performance.

4.7.2 Analysis of factors affecting ROE

Return on Equity (ROE) is a critical financial performance metric that assesses a bank's ability to generate profit for its shareholders based on the equity invested. A higher ROE implies efficient use of shareholder funds to generate earnings.

The analysis employs regression analysis to examine the relationship between ROE and the independent variables (LDR, NPL, and Bank Size). The financial data from Bank of Kigali Plc's annual reports and financial statements over a defined period are utilized for this analysis. The regression model aims to determine whether LDR, NPL, and Bank Size significantly influence ROE.

1. Estimation Command:

The command indicates a linear regression analysis, where we're estimating the dependent variable ROE (Return on Equity) using the independent variables LDR (Loan-Deposit Ratio), NPL (Non-Performing Loans) proxied by SERNPL, LOGBS (Log of Bank Size), and a constant term (C).

Figure 15: Regression test Result (ROE)

Dependent Variable: ROE
Method: Least Squares
Date: 08/08/23 Time: 13:24
Sample: 2011 2022
Included observations: 12

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LDR	-0.119465	0.043952	-2.718109	0.0263
SERNPL	-0.150931	0.055074	-2.740531	0.0254
LOGBS	5.833205	2.215297	2.633148	0.0300
C	-3.198068	11.83754	-0.270163	0.7939

R-squared	0.695787	Mean dependent var	19.52500
Adjusted R-squared	0.581707	S.D. dependent var	2.034755
S.E. of regression	1.315990	Akaike info criterion	3.648257
Sum squared resid	13.85464	Schwarz criterion	3.809893
Log likelihood	-17.88954	Hannan-Quinn criter.	3.588414
F-statistic	6.099112	Durbin-Watson stat	2.423156
Prob(F-statistic)	0.018324		

Source: E-views Software

2. Estimation Equation:

$$ROE = C (1) + C (2) *LDR + C (3) * NPL + C (4) * LOGBS (4.3)$$

This equation represents the linear relationship that's being estimated. The ROE is expressed as a linear combination of the three independent variables (LDR, NPL, LOGBS) with their corresponding coefficients (C2, C3, C4), along with a constant term (C1).

3. Substituted Coefficients:

$$ROE=-3.198068-0.119465237542*LDR-0.15093072219*NPL+5.83320513691*LOGBS (4.4)$$

This equation represents a model where Return on Equity (ROE) is estimated based on three independent variables: LDR (Loan-Deposit Ratio), NPL (Non-Performing Loans), and LOGBS (Log of Gross Bank Size). Let's break down the interpretation of the coefficients:

1. **LDR (Loan-Deposit Ratio) Coefficient: -0.119465237542** This coefficient indicates that a one-unit increase in the Loan-Deposit Ratio is associated with an estimated decrease of approximately 0.119-unit in ROE. This took a place by excessively high LDR which lead to increased risk exposure, potentially resulting in higher loan defaults and impairments, which can negatively affect profitability and ROE.

In line with the theories

A negative loan-to-deposit ratio presents various implications in the realm of financial theories. It may align with the Credit Default Theory as it signifies heightened credit risk, showcasing heavy reliance on external funding sources and potentially compromising the bank's capacity to absorb credit defaults effectively. However, it doesn't inherently relate to information asymmetry theory, which focuses on knowledge disparities between lenders and borrowers, leading to adverse selection and moral hazard. A negative ratio primarily points to funding and liquidity challenges. Nevertheless, if the negative ratio stems from riskier lending practices associated with undisclosed borrower information, it could indirectly connect to information asymmetry theory. Moreover, a negative loan-to-deposit ratio doesn't directly align with the financial accelerator theory, which relates to economic downturns

amplifying shocks due to reduced credit access. This ratio primarily highlights the bank's reliance on external funding without addressing the broader economic context and credit availability during downturns.

A negative loan-to-deposit ratio may indicate increased credit risk as it suggests heavy reliance on external funding sources, potentially compromising the bank's ability to absorb credit defaults effectively, aligning with Credit Default Theory.

2. **NPL (Non-Performing Loans) Coefficient: -0.15093072219** This coefficient suggests that a one-unit increase in Non-Performing Loans is associated with an estimated decrease of approximately 0.151-unit in ROE. This implies that higher levels of non-performing loans are expected to result in a lower ROE, assuming other factors remain constant because more provisions have been made, hence affecting the net profit.

In line with the theories

A negative non-performing loan (NPL) ratio intersects with various financial theories differently. It is not inherently linked to the credit default theory, which primarily concerns borrower default risk, whereas a negative NPL ratio suggests healthier credit quality without addressing the underlying causes of defaults. Similarly, it is not directly related to information asymmetry theory, which revolves around knowledge disparities between lenders and borrowers. A low NPL ratio may indicate good credit quality but doesn't necessarily resolve information asymmetry issues. However, a negative NPL ratio can align with the financial accelerator theory. When NPLs are low, banks tend to extend more credit, potentially amplifying economic fluctuations. Conversely, during economic downturns, an increase in NPLs can prompt banks to tighten credit standards, exacerbating the downturn, consistent with the financial accelerator theory.

3. **LOGBS (Log of Bank Size) Coefficient: 5.83320513691** This coefficient indicates that a one-unit increase in the Log of Bank Size leads to an estimated increase of approximately 5.833 in ROE. This suggests that larger bank sizes (as indicated by the logarithm of their size) are associated with higher ROE, assuming other factors are held constant.

In line with the theories

A positive bank size, often attributed to larger banks, introduces various dynamics within financial theories. Concerning credit default theory, larger banks may enjoy advantages such as diversified loan portfolios and enhanced resources for robust credit risk management. However, they also grapple with complexities and potential systemic risks. Consequently, a positive bank size can partly mitigate credit risk, yet it doesn't guarantee immunity from credit defaults; effective risk management remains paramount. In the context of information asymmetry theory, a positive bank size presents a nuanced relationship. While larger banks have the potential to reduce information asymmetry through greater data access and resources for due diligence, they may simultaneously encounter difficulties in maintaining close borrower relationships, possibly exacerbating information asymmetry. The nature of this relationship hinges on how effectively larger banks manage information asymmetry through their internal processes and resources. Moreover, a positive bank size aligns with the financial accelerator theory as larger banks wield significant influence over the financial system. Their lending decisions can amplify economic fluctuations, particularly during economic downturns, where they may substantially impact credit availability. This influence can potentially heighten the financial accelerator effect, either by restricting or expanding lending, contingent on their risk appetite and market conditions.

Interpretation Summary: The coefficients provide insights into the relationships between the independent variables (LDR, NPL, LOGBS) and the dependent variable (ROE). Here's a brief interpretation:

- A higher loan-deposit ratio is associated with a lower ROE.
- An increase in non-performing loans is linked to a lower ROE.
- Larger bank sizes, as indicated by the logarithm of their size, are associated with higher ROE.

These interpretations need to be considered within the context of the specific dataset and the broader banking industry. The model's predictions can help inform decisions related to managing non-performing loans, optimizing loan-deposit ratios, and understanding the impact of bank size on ROE for the given context.

Regression Analysis Results

The regression analysis yielded the following findings:

Loan-to-Deposit Ratio (LDR)

The analysis revealed that LDR has a statistically significant negative relationship with ROE.

This indicates that as the Loan-to-Deposit Ratio increases, ROE tends to decrease.

A higher LDR might imply a riskier loan portfolio composition, which could adversely affect the bank's profitability.

Non-Performing Loans (NPL)

The findings indicated a statistically significant negative relationship between NPL and ROE. As the proportion of Non-Performing Loans in the bank's portfolio increases, ROE decreases. This highlights the detrimental impact of NPLs on the bank's ability to generate returns for its equity holders.

Bank Size

Bank Size, measured by total assets, showed a statistically significant positive relationship with ROE, this suggests that larger banks might have a potential advantage in generating higher ROE, but other factors might also influence their profitability.

The findings underscore the importance of managing Loan-to-Deposit Ratios and Non-Performing Loans to enhance ROE. A higher proportion of non-performing loans or a riskier loan portfolio composition could lead to reduced returns for equity holders. The relationship between Bank Size and ROE implies that larger banks might have certain advantages in generating higher returns, but this relationship is complex and influenced by various factors.

CHAPTER FIVE: SUMMARY, CONCLUSION, AND RECOMMENDATIONS

5.1 Summary

The study's core focus lies in exploring the ramifications of non-performing loans (NPLs) on the financial performance of the banking industry in Rwanda, taking the case of Bank of Kigali Plc. NPLs, which signify loans not repaid for a period of ninety days and above, pose substantial threats to a bank's financial health. This issue is pertinent not only in the global banking landscape but also in Rwanda, where the banking sector's significance in economic development is growing. By conducting a detailed case study of Bank of Kigali Plc, a prominent Rwandan bank, the research endeavors to provide actionable insights and recommendations vital for both the bank and the Rwandan banking sector.

Bank of Kigali Plc has encountered a significant surge in NPLs, detrimentally affecting its financial performance. Understanding the factors underpinning this surge is imperative for devising effective strategies to mitigate NPL risks, enhance loan portfolio quality, and bolster overall financial well-being. The study seeks to address fundamental questions related to the primary drivers of NPLs, their consequences on Bank of Kigali Plc's financial performance, and the strategies the bank can employ to proficiently manage NPLs, thus elevating its financial performance.

The research's findings contribute empirical evidence and insights into the factors influencing NPLs and their impact on financial performance, thereby bridging a critical research gap.

Policymakers, regulators, and bank managers in Rwanda stand to gain significant value from these insights, as understanding the NPL influencer's aids in formulating effective policies and strategies to mitigate credit risk and enhance banking stability and profitability.

While the study is geographically confined to the Rwandan banking sector and Bank of Kigali Plc, it examines the intricate connection between NPLs and financial performance over an extensive period from 2011 to 2022, drawing data from financial reports. However, the research acknowledges its limitations, including potential challenges in generalizing findings to other banks or financial institutions due to the unique characteristics of Bank of Kigali Plc, data constraints, and external factors that might affect the findings' applicability and accuracy.

Data collection methods encompass extensive documentation, including financial reports, loan portfolios, NPL data, profitability metrics, economic indicators, and other pertinent information.

A rigorous regression analysis evaluates the impact of three independent variables on several dependent variables, including Return on Equity (ROE), Return on Assets (ROA), NPLs, Loan to Deposit Ratio (LDR), and Bank Size (BS). This analysis leverages E-views Version 12 statistical software, estimating coefficients and assessing their significance. Nevertheless, the study underscores the secondary nature of the data, forgoing formal validity or reliability tests while adopting descriptive and inferential statistical techniques to illuminate the intricate relationships between independent and dependent variables.

In summary, the research findings highlight several critical insights:

- All coefficient on ROA model to be non-significant which indicate that the model may not effectively explain the variation in the data and underscores the complex nature of the relationship between non-performing loans and financial performance indicators within the specific setting of Bank of Kigali Plc as measured by Return on Assets.
- A statistically significant negative relationship between Loan-to-Deposit Ratio (LDR) and Return on Equity (ROE), underscoring the adverse impact of a high loan concentration relative to deposits on profitability.
- A similar statistically significant negative relationship between Non-Performing Loans (NPLs) and ROE, emphasizing the paramount importance of robust NPL management in preserving favorable returns for equity holders.
- A positive statistically significant relationship between Bank Size (BS) and ROE, signifying that while larger banks may possess potential for higher profitability, other factors influence performance within Rwanda's banking landscape.

These findings furnish invaluable recommendations for Bank of Kigali Plc and the Rwandan banking sector, helping them bolster financial performance, adeptly manage NPLs, and contribute positively to the nation's banking industry.

5.2 Conclusion

In line with the objectives of the study, which aimed to assess the effects of non-performing loans on the financial performance of Bank of Kigali and, by extension, evaluate its impact on the Rwandan banking industry, the study's conclusion provides valuable insights into these relationships.

The analysis conducted in the study underscores the importance of evaluating the impact of non-performing loans on financial performance, as well as their broader implications for the Rwandan banking industry. Specifically, the study reveals that the Loan-to-Deposit Ratio (LDR) has a statistically significant negative relationship with Return on Equity (ROE). This emphasizes the need for banks, including Bank of Kigali, to carefully manage their loan-to-deposit ratios to maintain profitability.

Furthermore, the study finds that Non-Performing Loans (NPL) also have a statistically significant negative relationship with ROE. This highlights the critical role of effective NPL management in preserving favorable returns for equity holders, aligning with the thesis's objective of assessing the effects of non-performing loans.

While the relationship between Bank Size and ROE is positive and statistically significant, which suggests that while larger banks may have the potential for higher ROE, other factors also influence profitability within the Rwandan banking industry. Otherwise, all coefficient on ROA model found to be non-significant which indicate that the model may not effectively explain the variation in the data and underscores the complex nature of the relationship between non-performing loans and financial performance indicators within the specific setting of Bank of Kigali Plc as measured by Return on Assets.

The study's insights underscore the importance of maintaining a balanced loan portfolio, effectively managing NPLs, and considering the broader impact of Bank Size on financial performance. By implementing prudent risk management strategies and capitalizing on growth opportunities, Bank of Kigali Plc can enhance its ability to generate favorable returns for its equity holders and contribute positively to the Rwandan banking sector, aligning with the overarching objectives of the study.

5.3 Recommendations

The recommendations section is a crucial component of the thesis as it translates the research findings into actionable steps for addressing the issues or challenges identified in the study. In light of the research conducted, the following recommendations are proposed:

5.3.1 Recommendations for Bank of Kigali Plc

- **To improve its market share, consider the following:**

Diversification of Services: BK can expand its product and service offerings to cater to a broader customer base, including digital banking solutions, investment products, and personalized services.

Customer-Centric Approach: Implement strategies that prioritize exceptional customer experiences, fostering loyalty and attracting new clients.

5.3.2 Recommendations for Future Research

This case study provides valuable insights into the effects of NPLs on Bank of Kigali Plc's financial performance. However, further research could expand the analysis to encompass a larger sample of banks in Rwanda, offering a comprehensive view of the sector's dynamics. Additionally, investigating the long-term effects of NPL management strategies on bank performance could contribute to a deeper understanding of best practices in NPL management. Also could expand the analysis to include a broader sample of banks in Rwanda to validate the findings and identify sector-wide trends. Additionally, exploring the impact of macroeconomic factors on the relationships studied could provide a more comprehensive understanding of the dynamics influencing bank profitability.

Implementing these recommendations can position Bank of Kigali Plc to mitigate the negative effects of non-performing loans and sustain a healthier financial performance in the future.

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