**FACTORS AFFECTING NON-PERFORMING LOANS IN BANKING SECTOR IN TANZANIA**

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# CERTIFICATION

The undersigned certify that they have read and hereby recommends for acceptance by the Open University of Tanzania a dissertation titled: **“Factors affecting Non-performing loans in banking sector in Tanzania”** in partial fulfillment of the requirements for degree of Master of Business Administration (Finance) of the Open University of Tanzania.

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# DEDICATION

I dedicate this entire work to my lovely mother. She inspired me to study and even gave me the money to register. I also dedicate it to my beautiful daughters, Genevieve and Gianna, for always being there for me during my studies. Moreover, I thank my friend Triphonia for pushing me to study and supporting me. God bless you all.

# ABSTRACT

The study determined the factors affecting non-performing loans in Tanzania's banking sector. Specifically, the study determined the influence of inflation on non-performing loans, the influence of liquidity on non-performing loans, the influence of gross domestic product on non-performing loans, and the influence of capital adequacy on non-performing loans in Tanzania. The study used a descriptive research design and secondary data that covered the period from 2019 to 2023.  Correlation and multiple regression analysis analyzed the data using STATA software. The results showed that liquidity had a significant impact on non-performing loans. Also, the results showed that inflation significantly influenced non-performing loans. Moreover, the results showed that gross domestic product significantly influenced non-performing loans. Likewise, the results showed that capital adequacy did not significantly influence non-performing loans. The study recommends that the Bank of Tanzania increase its GDP monitoring framework while assessing the soundness and stability of the country's banking sector. Furthermore, the study recommends that commercial banks keep their liquidity ratio at the required rate, which will reduce the NPL ratio. The study suggests that efficient loan management should be a priority. Furthermore, inflation should be controlled to promote a more stable economic climate that supports borrowers' financial health by lowering the risk of non-performing loans.

**Keywords: *Factors, Non-Performing Loans, Banking Sector, Tanzania***

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# LIST OF ABREVIATIONS

BOT Bank of Tanzania

GDP Gross Domestic Product

IMF International Monetary Fund

NPLs Non-Performing Loans

OUT Open University of Tanzania

ROE Return on Equity

SPSS Statistical Package for Social Science

# CHAPTER ONE

# INTRODUCTION

# Overview

This chapter introduces the study topic. It comprises background information, a statement of the problem, the study objectives, research questions, significance, scope, and organization of the study.

# Background of the Study

A non-performing loan represents a financial asset for which the bank fails to collect interest or make scheduled payments (Anjom & Karim, 2016). Essentially, when a loan no longer brings in revenue for the bank and stops functioning as per the agreement between the bank and the borrower, it is considered a non-performing loan (Fernando & Rathnasiri, 2019). Non-performing loan are realized when there is a drop in the bank's loans collection (Asfaw et al., 2016). The banking industry has undergone an increase in loans that are not performing, suggesting an overall decline in health and inadequate management within one of the economy's key areas (Gabriel et al., 2026). A loan is classified as non-performing if it is either in default or close to default. Another name for a non-performing loan is a troubled loan (Funyina &Muhanga, (2021). Loans typically turn into troubled loans following ninety days of default, although this period can differ depending on the agreement terms (Gabriel et al., 2019).

Various theories, including the liquidity risk theory, the theory of economic expansion, and the business cycle of non-performing loans, back the idea of non-performing loans. The liquidity risk theory suggests that risk emerges when a project is unable to secure enough resources to cover its debts or when a company struggles to make payments when they are due (Merna & Njiru, 2002). Additionally, the theory of economic expansion posits that the overall growth rate of GDP is the key factor influencing non-performing loans (Beck et al., 2013).

Numerous research studies have explored the impact of various factors on non-performing loans. Awuor. (2015) discovered a negative correlation between the size of a bank, the quality of its assets, and the amount of non-performing loans it holds. Additionally, there exists a beneficial link between liquidity, operational cost-effectiveness, profit-making capacity, and the volume of loans that do not perform (Fernando & Rathnasiri, 2019). Klein (2013) found that broader economic conditions like joblessness rates, GDP expansion, and inflation affect the number of loans that do not perform. He also mentioned that elevated numbers of such loans in these nations might obstruct the process of economic revival. Furthermore, Gabriel showed that higher profitability banks typically have lower percentages of non-performing loans, as they are better positioned to implement effective credit management strategies.

In Tanzania, a credit reference system has been employed as a method to lower the proportion of loans held by banks that are not performing (Nadham & Nahid (2015). The introduction of the credit preference system has shown promising outcomes in minimizing the number of borrowers who default (Helgilibrary, 2024). For instance, in 2017, when the percentage of total loans that are non-performing rose from 8.7 percent to 10.6 percent, the Bank of Tanzania mandated all commercial banks to adopt a credit reference system. This directive decreased the proportion of non-performing loans to total loans from 10.6 percent to 10.3 percent by 2018 (BOT, 2022). The proportion of non-performing loans (NPLs) to total loans in Tanzania fell to 9.58 percent in 2019 from 10.3 percent in 2018, though it remained above the ideal level. The ratio continued to drop to 9.3 percent in December 2020 and 7.8 percent in 2021, still exceeding the target of 5 percent (Cowling, 2024). However, NPLs declined to 4.3 in December 2023 from 5.8 of December 2022 (BOT, 2023). To tackle the elevated amounts of loans that are not performing, the Bank of Tanzania and banks have implemented various strategies. These strategies include enhancing the credit-underwriting process, increasing the reliance on credit reference systems to mitigate credit risk exposure, and improving efforts to recover loans (BOT, 2023).

Various macroeconomic and bank-specific elements contribute to increased classified loans within the banking sector (Viswa & Nahid, 2016). Regarding macroeconomic elements, factors like the annual GDP growth rate, real interest rates, exchange rates, inflation rates, and the ratio of public debt to GDP are of particular interest. Conversely, factors unique to banks encompass the growth of loans, the profitability of equity, the availability of funds, the profitability of assets, the ratio of loans to assets, the ratio of loans to deposits, the ratio of total capital to total assets, the ratio of operating expenses to operating income, the ratio of total liabilities to total assets, and the ratio of non-interest income to total income (Fernando et al., 2019).

Research has been conducted on the factors influencing non-performing loans in commercial banks, focusing on factors like liquidity, inflation, and gross domestic product. Studies by various researchers, including Onyango and Olando (2020), Msomi (2022), Ibish et al. (2018), Alnabulsi et al. (2022), Al Masud and Hossain (2021), Aynalem (2016), Funyina and Muhanga (2021), have explored these determinants. However, the conclusions drawn from these studies are not always consistent. For instance, Al Masud and Hossain (2021) identified that certain factors (liquidity, inflation, gross domestic product, and capital adequacy) affect non-performing loans. In contrast, Ibish et al. (2018) suggested that these factors do not have an impact.

Moreover, the lack of clarity regarding the specific factors affecting non-performing loans highlights the need for further research to understand their influence. Additionally, the research conducted in Tanzania has not encompassed all the selected variables, leading to a shortage of studies focusing on these specific factors. The increasing level of these loans indicates that banks perceive it challenging to secure premium returns and capital on their loans. This situation could lead to reduced profitability for banks in Tanzania and potentially result in bank closures (Klein, 2013). As feasible, effective credit management and swift reduction and removal of non-performing loans are among banks' key critical and primary responsibilities.

# Statement of the Problem

Tanzania has been experiencing a significant issue of non-performing loans (NPLs) within its financial institutions, as the International Monetary Fund (IMF) reported in 2019. The proportion of NPLs to total loans in Tanzania rose from 10.3% in 2018 to 9.58% in 2019, surpassing the ideal threshold of less than 5%. This trend continued, with the ratio reaching 9.3% in December 2020 and 7.8% in 2021, both still exceeding the recommended level (BOT, 2022). Despite the NPL declined from 5.8 to 4.3 from December 2022-December 2023 (BOT 2023), the data from BOT (2023) indicates the fluctuation of banks NPL in Tanzania. Given that banks rely heavily on the performance of their loans for income, the uncontrolled growth of NPLs could lead to the downfall of commercial banks, the banking sector as a whole, and the economy at large (Mazorodze, 2017).

Despite the Bank of Tanzania's (BOT) initiatives, including the mandate for banks to improve their credit assessment standards and efforts in loan recovery, the report suggests that many financial institutions are still struggling with NPLs (BOT, 2022). Managing NPLs is crucial for a bank's financial health and the overall economic environment.

A research project explored the factors influencing non-performing loans among commercial banks. However, the conclusions drawn by various studies, such as those by Msomi (2022), Onyango and Olando (2020), Funyina and Muhanga (2021), and Al Masud and Hossain (2021), are not clear. For instance, Al Masud and Hossain (2021) identified certain variables (liquidity, inflation, gross domestic product, and capital adequacy) as significant in predicting NPLs. In contrast, Ibish et al. (2018) found no correlation between these variables and NPLs. Moreover, the specific factors affecting NPLs remain unclear due to the lack of consensus among previous research. Therefore, there is a need for further research to clarify whether the identified factors indeed contribute to NPLs.

Additionally, the studies conducted in Tanzania have not encompassed all the relevant variables, leading to a shortage of literature on the topic. Thus, it is necessary to investigate the impact of inflation, liquidity, and gross domestic product on non-performing loans within the Tanzanian context. Therefore, this study provides relevant data for the commercial banking sector, particularly in Tanzania, investigating the factors affecting non-performing loans among commercial banks in Tanzania.

# 1.4 Objective of the Study

# 1.4.1 General Research Objective

The main objective of this Study is to determine the factors affecting Non-performing loans in banking sector in Tanzania. Taking selected commercial banks as case study.

# 1.4.2 Specific Research Objectives

This study was guided by three objectives as follow;

1. To determine the influence of liquidity on non-performing loans
2. To determine examine the influence of inflation on non-performing loans
3. To examine the influence of gross domestic product on non-performing loans
4. To examine the influence of capital adequacy on non-performing loans

# 1.5 Relevance of the Study

The study's outcomes are pertinent to theoretical considerations by altering current theories, such as those on the business cycle and non-performing loan theories, and by developing new theories that explore the connections between issues, interventions, and outcomes. The research assists financial institutions in gaining deeper insights into the significance of the factors contributing to non-performing loans. It also provides banks with knowledge of the credit management challenges in Tanzania and the strategies required to address these issues.

Furthermore, the study supplies the government with valuable information to inform policy-making and reduce the factors contributing to non-performing loans in financial institutions. It will also enhance the current body of knowledge and address the existing gaps in understanding the causes of loan defaults in micro-enterprises. Additionally, it will serve as a reference source for scholars.

# 1.6 Scope of the Study

This study aimed to investigate the factors affecting non-performing loans in the banking industry in Tanzania. The study included commercial banks as a case study whereby secondary data from bank reports was collected. The data included NMB, CRDB, NBC, DTB, MCB, Standard charted, Stanbic, KCB, Equity and ACB. The study was limited to the period from 2019 to 2023. Therefore, the sample size of the study was 10 selected commercial banks. The selected banks considered data availability based on the selected study period. This made 50 observations and its recommended that for panel data observation should not be less than 30 (Longhi, 2014).

# 1.7 Organization of the Study

The research is structured into five chapters. The initial chapter provides the necessary background details, outlines the research problem, states the objectives of the study, and explains the importance and scope of the research. The second chapter offers an overview of the literature, including definitions, theoretical background, and a review of relevant studies. The third chapter details the methods employed in the research, covering the study's philosophy, approach, design, participants, location, sampling methods, variables, data collection techniques, processing and analysis, reliability and validity, and ethical considerations. The fourth chapter discusses the analysis of the collected data and the findings, while the fifth chapter concludes the study with recommendations.

# CHAPTER TWO

# LITERATURE REVIEW

# 2.1 Overview

This chapter reviews various literature linked to this topic. It comprises the definition of important terminology, theoretical framework, empirical literature, research gap, and conceptual framework, presented in subsections.

# 2.2 Conceptual Definitions

# 2.2.1 A Non-Performing Loan

Non-performing loans have seen a decline in their creditworthiness, and the complete repayment of both the principal and interest, as agreed upon in the loan/advances' terms, has been doubted and postponed for over three months (Apostolik & Donohue, 2015). Underperforming loans (NPLs) are occasionally described as the proportion of NPLs within a bank's loan collection to the total amount of loans outstanding (Anjom & Karim, 2016). Therefore, this study employed the definition of non-performing loans created by Anjom and Karim (2016) who asserted that the non-performing loans are loans that are due and have not been paid according to the contract

# 2.2.2 Liquidity

Onyango and Olando (2020) define liquidityas the ease with which a security or asset can be purchased or sold for a price in the market that corresponds to its intrinsic worth. Liquidity refers to liquid assets or assets with a simple cash conversion rate to fulfill immediate operational needs (Patni & Darma, 2017). Liquidityis the quantity of liquid assets available to cover expenses and debts as they come due (Messai & Jouini, 2013).  Therefore, this study employed the definition proposed by Patni and Darma (2017) who appreciated that the bank is liquid when it has sufficient cash to cover the short term and long-term obligations.

# 2.2.3 Inflation

Inflation is described as the speed at which the typical price level within a country rises over a certain timeframe (Khan, 2011). The inflation rate is determined by variations in the mean price ranges (Nadham & Nahid, 2015). The inflation escalates the widespread and persistent rise in the cost of goods and services in a given country (Khan, 2011). Stated differently, it occurs when the cost of commodities increases (Mustafa & Sali, 2019). Therefore, to guarantee that readers comprehensive understanding of the term inflation, the definition by Mustafa and Sali (2019) is adopted.

# 2.2.4 Gross domestic Products

Zainol et al. (2018) describe GDP as the sum of all goods and services produced within a country's borders during a specific timeframe. The gross domestic product is the total value of all goods and services created within a particular area over a certain period (Anjom & Karim, 2016). This study followed the definition created by Zainol et al. (2018) because the inflation determines the price of goods and services in a particular country.

# 2.2.5 Capital Adequacy

Capital adequacy is the proportion of total equity to total assets annually (Patni & Darma, 2017). This measure shows how effectively a bank can fulfill its financial commitments, as indicated by the capital adequacy ratio, or CAR. This ratio, also known as the capital-to-risk-weighted assets ratio (CRAR), is utilized by authorities to evaluate a bank's susceptibility by contrasting its capital with risk-weighted assets to failure. It is employed to safeguard depositors and improve the effectiveness and stability of the world banking system (Apostolik & Donohue, 2015). Consequently, Apostolik and Donohue's (2015) definition was used in because explains well the meaning and importance of the capital adequacy.

# 2.3 Theoretical Literature Review

The theories applied in this investigation are presented in this part. A theory is a set of beliefs an individual or group holds that aims to forecast and explain the current state of affairs. Business cycle and NPLs theory was applied by this study. This theory was formulated by Kydland and Prescott in 1982. The theoretical business cycle link well the concept of non-performing loans. This theory demonstrates a clear role of the banks’ financial intermediation and provide a solid foundation for modeling non-performing loans. The theory highlights the relationship between the credit risk management and business collapses (Williamson, 1987). The theory proposes that the elements leading to loans that do not perform as expected are systemic/structural and macroeconomic (Arham et al., 2024). Systemic or structural elements are associated with financial oversight and regulation and the reward systems in these sectors (Lumpkin, 2011). It is understood that differences in financial regulation and supervision can influence banks' behavior and risk management strategies, playing a crucial role in explaining the variations in non-performing loans across different countries (Apostolik & Donohue 2015). The macroeconomic conditions affecting borrowers' financial situations and their ability to repay their debts vary across studies, but common macroeconomic indicators such as GDP growth, inflation, exchange rates, interest rates, and unemployment, along with bank-specific factors like capital adequacy, liquidity, and management efficiency, are typically considered in the analysis of non-performing loans (Arham et al., 2024).

There is a relationship between these variables; for example, inflation might negatively impact non-performing loans, as higher inflation can increase the ability of borrowers to repay their loans by reducing the real value of their outstanding debt (Mahyoub & Said, 2021). Banks' liquidity is crucial for meeting the immediate demands of depositors, which is vital for the survival and sustainability of banks. Consequently, if banks fail to meet these demands, it can lead to a liquidity crisis (Adegbie, & Dada, (2018). The rate at which the GDP expands, also reduces the NPL (Kartikasary et al., 2020). In this circumstance, the earnings of companies and families rise, and individuals with debts can repay them (Guy & Lowe, 2011).

The strength of this theory lies in its cost-effectiveness for clients. Large financial intermediaries can also benefit from the ability to diversify their risks through the investment of client funds or premiums in a variety of financial products, thereby reducing clients' risk. However, the business cycle theory also has drawbacks, including the potential for lower investment returns, misaligned goals, credit risk, and market risk.

One of the limitations of this theory is that it focuses solely on the stability of banks, neglecting other critical factors such as the uneven distribution of new loan applications, the issue of selecting borrowers with unfavorable characteristics, and the risk of borrowers not fulfilling their obligations due to moral considerations (Kraft & Jankov, 2005). These elements are crucial for understanding the conventional reasons behind loan defaults, which affect the banking sector's stability. Identifying reliable borrowers can be challenging, potentially leading to adverse selection and moral hazard issues. Cottarelli et al. (2005) highlight how the expansion of loans can increase banks' risk-taking behavior, contributing to instability. Additionally, the theory does not account for situations where depositors lack complete information about the nature of the risks facing banks or the interconnectedness of banks (De Bandt & Hartmann, 2000).

This theory is pertinent to the research as it elucidates how the spectrum of non-performing loans is shaped by both systematic risks (macroeconomic conditions) and idiosyncratic risks (factors specific to commercial banks). On one side, banks with ample liquidity might be more inclined to seize opportunities, potentially leading to a higher risk profile in their loan portfolios. During economic downturns, the incidence of non-performing loans is anticipated to rise. Inflation can diminish borrowers' ability to repay their loans by reducing their cash flow.

# 2.4 Empirical Literature Reviews

# 2.4.1 Liquidity and non-performing loans

Onyango and Olando (2020) examined how specific factors within banks influence the occurrence of non-performing loans among commercial banks in Kenya. This research utilized a descriptive design, focusing on the forty-three currently licensed commercial banks as the target population. The methodology involved collecting secondary data through a census approach and gathering financial statements and other financial reports spanning 2012 to 2016. They applied numerical methods to create summary statistics and carried out predictive analysis to craft a framework for forecasting loans that are not performing well, considering factors related to banks. The results showed that the liquidity ratio shows a direct, significant negative correlation with such loans.

Moreover, the profitability of assets (ROA) adversely affects such loans in commercial banks in Kenya. Consequently, the study concluded that an enhancement in the liquidity ratio reduces non-performing loans for commercial banks in Kenya. Conversely, a decrease in the liquidity ratio is associated with increased non-performing loans among commercial banks within Kenya. The research concentrated exclusively on factors specific to banks, ignoring broader economic aspects such as inflation and Gross Domestic Product.

Msomi (2022) assessed the determinants of non-performing loans in commercial banks across selected West African nations. The research, conducted as a cross-sectional survey, gathered secondary data from commercial banks from 2014 to 2019. This data encompassed various aspects of bank performance, including non-performing loans (NPL) levels, alongside specific characteristics of banks, such as asset quality, operational cost efficiency, earnings ability, liquidity, and bank size. The analysis was conducted using inferential methods.

The research indicated a negative correlation between bank size, asset quality, and the levels of non-performing loans. Furthermore, there was a positive correlation between liquidity, operational cost efficiency, earnings capability, and non-performing loan levels. The study concluded that the enhancement of liquidity positively impacts banks' non-performing loan ratios, indicating mismanagement of surplus funds within the institution, which has relaxed loan management practices. However, the study was constrained to bank-specific factors, omitting macroeconomic variables such as GDP.

Mdaghri (2022) assessed how NPLs affect banks’ liquidity in the Middle East and North Africa region. The study applied the three-step formula introduced by Berger and Bouwman in 2009. The study found that banks' liquidity influenced NPL in the region. The study emphasized that banks promote liquidity to catalyze economic growth. However, the study did not consider factors such as inflation, gross domestic product, and capital adequacy. Using the model of Panel Smooth regression, Pop et al. (2028) analyzed the liquidity threshold for the non-performing loans. The study demonstrated that a bank with a ratio of 95% of loans and deposits has a high risk of deposit. However, the study did not analyze how the gross domestic product influences the NPLs.

Taiwo and Mike (2021) analyzed the relationship between NPLs and Nigerian banks’ liquidity using the panel-based regression approach. The findings indicated that NPLs, inflation, bank size, and capital adequacy ratio positively and significantly influenced bank liquidity. However, the study did not analyze the determinants of NPLs but rather that of liquidity. Muriithi (2014) used regression analysis to examine how liquidity influences Kenyan commercial banks' NPLs. The findings indicated that high NPLs affect commercial banks' liquidity. However, the study found that liquidity and capital adequacy negatively influence NPLs. The study did not assess the influence of GDP on NPLs. Moreover, the major concentration was on liquidity rather than other factors such as inflation and gross domestic product.

Umar and Sun (2016) used the panel data regression model to examine the influence of NPLs on Chinese banks’ liquidity. The findings indicated that liquidity had no influence on Chinese banks’ liquidity. However, the study did not analyze how inflation, gross domestic product, and capital adequacy influenced NPLs. Based on literature reviews, the study developed the hypothesis as follows;

**H1: There is a significant positive relationship between liquidity and non-performing loan**

# 2.4.2 Inflation and non-performing loans

Ibish et al. (2018) researched the factors influencing the extent of non-performing loans in commercial banks in emerging economies. The investigation employed various econometric techniques and models to ensure reliability, such as Fixed and Random Effects Models and the Arellano-Bond Dynamic Panel estimation method to examine the data. The results indicate that GDP growth, inflation, and operational efficiency are significantly linked to the extent of Non-Performing Loans. In contrast, unemployment is found to have a positive relationship with Non-Performing Loans. The study concluded that findings carry significant implications for the stability of banking sectors within transition countries and the influence of macroeconomic policies in this context. However, the study did not provide a definitive explanation of how these variables determine Non-Performing Loans and factors like liquidity were not considered.

Džidić et al. (2022) explore the primary macroeconomic elements affecting Non-Performing Loans (NPLs) within the banking industry of Bosnia and Herzegovina—the research employed time series analysis, complemented by the application of a fixed effects panel regression model. The research employs the autoregressive distributed lag (ARDL) technique to examine the interplay between long-term and short-term fluctuations in macroeconomic data. The results show that a rise in real GDP is linked to a fall in Non-Performing Loans, while a rise in unemployment is connected to an increase in Non-Performing Loans, and consumer prices are linked to higher Non-Performing Loan levels at a 5% significance level. The study concluded that this may be because it serves as a measure of the banking system's health within a nation, thereby reflecting the economic well-being of that country in both the immediate and long-term periods, owing to its consequences for investment. This study was limited to macroeconomic factors and excluded bank-specific factors like liquidity.

Tham et al. (2024) analyzed the influence of inflation on property NPLs in Malaysia using regression analysis. The study found that inflation negatively and significantly influenced NPL. However, the way the determinants of liquidity, gross domestic product and capital adequacy affected the NPLs was not under focus. Ptasica (2019) assessed the influence of the interest rate and inflation on the commercial banks’ NPL in Cyprus using correlation analysis. The findings showed that inflation and interest rates negatively influenced the NPLs. However, liquidity, gross domestic product, and capital adequacy variables were not considered.

Using path analysis, Sinaga et al. (2020) analyzed the influence of interest rate and inflation on XYY commercial banks. The findings indicated that interest rates and inflation did not influence the NPLs. However, the study did not analyze how liquidity, gross domestic product, and capital adequacy influence non-performing loans. Using panel regression analysis, Ahmad et al. (2018) indicated that the GDP growth rate negatively and significantly influenced NPLs.  The findings showed that the rate of Inflation, Exchange rate, and Unemployment Rate positively and significantly influenced the NPLs. However, the variable of tax adequacy was not covered.

Based on literature reviews, the study developed the hypothesis as follows;

**H2: There is a significant negative relationship between inflation and non-performing loan**

# 2.4.3 Gross domestic product and non-performing loans

Alnabulsi et al. (2022) explored the factors influencing non-performing loans (NPLs) during financial and health crises across the Middle East and North African banks. They utilized a regression analysis to study the data. The results showed that the susceptibility of NPLs to bank-specific characteristics was higher than that to broader economic conditions. Specifically, the macroeconomic context and the quality of institutions played crucial roles in determining NPL levels. Nonetheless, the influence of the COVID-19 pandemic on NPLs was not found to be significant. The study concluded that commercial banks are encouraged to concentrate on internationally competitive sectors. Implementing measures to lower lending rates, stimulate GDP growth, and decrease unemployment rates will also reduce Non-Performing Loans (NPLs). This research focused solely on the determinants of NPLs during crises, including the COVID-19 pandemic.

Nathan et al. (2020) investigated the factors contributing to non-performing agricultural loans in Uganda's commercial banking sector. Data was gathered from 152 participants and analyzed using tables, percentages, mean, and standard deviation. The data collection methods employed for this study included interviews, questionnaires, and documentary evidence. They employed ARDL and bounds test methods to analyze the data. The study revealed that higher lending rates, real effective exchange rates, and unemployment rates were associated with increased NPLs.

Conversely, higher returns on assets and GDP growth rates decreased NPL levels. The study concluded that commercial banks need to consider diversifying their asset portfolios by investing in other income-generating assets, such as government bonds and equity, to mitigate exposure to credit risk. The study was limited to agriculture-based Loans only and ignored some variables such as capital adequacy, liquidity, and inflation.

Nathan et al. (2020), using the ARDL model, assessed the determinants of NPL for commercial banks in Uganda. The findings indicated that lending rates, real exchange rate, unemployment rate, ROA, and GDP growth negatively affected the NPLs. However, the study did not examine how the inflation influenced the NPLs. Al Masud and Hossain (2021) analyzed what determines NPLs in emerging economy countries using the generalized method of the moment. The findings revealed that ROA negatively and significantly influenced NPLs. However, unemployment, stock prices, GDP growth, and inflation positively influenced NPLs. However, the variable of capital adequacy was not considered during the analysis.

Akhter (2023) examined the influence of banks’ NPL in Bangladesh using a regression model. The findings showed that ROE and GDP negatively and significantly influenced NPL. Inflation also positively influenced NPLs. However, the study did not assess how liquidity influenced NPLs. Džidić et al. (2022) used regression analysis to assess how Macroeconomic determinants influenced the NPLs in Bosnia and Herzegovina. The findings showed that GDP growth negatively influenced the NPLs. However, the unemployment rate and consumer prices positively and significantly influenced the NPLs of Kenyan commercial banks. However, the study did not analyze how liquidity influenced the NPLs. Based on literature reviews, the study developed the hypothesis as follows;

**There is a significant positive relationship between Gross domestic product and non-performing loans***.*

# 2.4.4 Capital Adequacy and non-performing loans

In a study conducted by Funyina and Muhanga (2021), the determinants of non-performing loans in Zambia were explored. The research was a cross-sectional survey, gathering secondary data from commercial banks from 2010 to 2014. The research utilized a dynamic panel data approach, combining integration and fully modified ordinary least square models to analyze the data. The findings suggest that bank-specific factors, such as capital adequacy and interest rates, and macroeconomic conditions, including unemployment rates, influence non-performing loans.

Specifically, the study found that a depreciation in the Kwacha significantly increases non-performing loans across all categories, including both large and foreign banks, but decreases them in small and domestic banks. However, the impact of capital adequacy on non-performing loans was found to be less significant. The study concluded that categories of large and international banks may be susceptible to increased credit default risk in the event of a depreciation in the Kwacha. This is attributed to their propensity to lend in foreign currencies. The study did not clearly explain the relationship between the variables used and non-performing loans, nor did it consider other factors such as liquidity, inflation, and GDP.

Similarly, Tham et al. (2021) investigated the determinants of Malaysian commercial banks' non-performing loans (NPLs) ratio. This research utilized a descriptive research design, focusing on the nine licensed commercial banks as the target population. A census approach was employed to collect secondary data from the financial statements of the previous year and additional financial reports spanning the period from 2012 to 2019. Regression was used to analyze data. The study revealed that the capital adequacy ratio is key in assessing the extent of non-performing loans across the selected banks.

Additionally, the research discovered that actual gross domestic product and inflation rates have no impact on the non-performing loans ratio of the selected commercial banks. The study concluded that the escalation in non-performing loans exerts a detrimental effect on the banking sector. Consequently, comprehending the determinants of non-performing loans is imperative for preserving the overall economy's productivity. The study included only one bank-specific factor; other variables, such as liquidity, are required.

Using the panel data regression analysis, Yulianti et al. (2018) assessed how the NPLs public banks were influenced by adequacy of capital in Indonesia. The findings indicated that the ratio of capital adequacy positively influenced the NPLs. However, the findings showed that the size of the bank and a ration of loans and deposits negatively influenced the NPLs. However, the influence of inflation and GDP were not considered.

Swandewi and Purnawati (2021) investigated the way the ratio of capital adequacy mediated the NPL and the returns on assets (ROA) in Indonesia using the regression analysis. The findings revealed that NPLs negatively influenced capital adequacy ratio.  Moreover, the capital adequacy ratio positively and significantly influenced ROA. moreover, NPLs negatively and significantly influenced ROA. However, the study did not assess how the GDP and inflation influenced NPLs. Moreover, the study used the direct and reverse relationship of the variables, However, the current study concentrated on analyzing how the capital adequacy influenced the NPL. Based on the research results, it is proven that the capital adequacy ratio mediates the effect of non-performing loans on return on assets.

Brastama and Yadnya (2020) examined the influence of capital adequacy on NPLs with the intervening variable of profitability in Indonesia using the regression method. The finding exposed that capital adequacy ratio positively influenced ROA and prices of stocks. However, the findings showed that NPLs influenced ROA and stock prices. However, the variables of inflation and GDP were not included in the study.

Using the regression analysis, Nugroho et al. (2021) analyzed how the banks’ capital adequacy was influenced by the loan and loss provision and NPLs in Indonesia. The findings indicated that the loan and loss provision and capital adequacy were not correlated. However, the findings showed that NPLs negatively influenced the capital adequacy. However, the variables of GDP and inflation were beyond the scope of the study. Malimi (2017) analyzed how the capital adequacy affected the Tanzanian commercial banks NPLs using the regression analysis. The findings disclosed that profitability and capital adequacy had insignificant influence on NPLs. However, the findings showed that the inflation and GPD were not part of the study’s scope.  Based on literature reviews, the study developed the hypothesis as follows;

**There is a significant negative relationship between capital adequacy and non-performing loan**

# 2.5 Research Gap Identified

A study has been done on the factors influencing commercial banks' non-performing loans. However, the conclusions of most researchers, like Msomi (2022), Onyango and Olando (2020), Anjom and Karim (2016), and Al Masud and Hossain (2021), are unclear on the variables influencing non-performing loans. For example, some researchers, such as Nadham and Nahid (2015), found that the selected variables have less influence on non-performing loans. On the other hand, other researchers, such as Al Masud and Hossain (2021), found that the selected factors greatly impact non-performing loans. Furthermore, because the selected criteria were unclear to previous researchers, additional research is required to determine if the selected factors led to non-performing loans. Furthermore, the research completed in Tanzania, like Mpina and Kagoro (2021), who examined the determinants of Non-Performing Loans in Commercial Banks in Tanzania, did not cover all of the selected variables; thus, there is a scarcity of studies based on selected variables. Therefore, there was a need to conduct a current study on factors affecting non-performing loans by looking at inflation, liquidity, and GDP.

# 2.6 Conceptual Framework

The conceptual framework of this research is connected to the independent and dependent variables. The conceptual structure of this study show the relationship between independent variables (liquidity, gross domestic product, capital adequacy and inflation towards dependent variable which non-performing loans. The connection is illustrated in the Figure 2.1.Danger emerges when a project fails to generate enough funds to cover its debts or when a company is unable to fulfill its financial obligations when they become due. An increase in this ratio signals that the bank is allocating more funds for loans. A less liquid position for the bank indicates this scenario (Keitshokile, 2020).

Inflation is the rate at which a country's average prices of goods and services increase over time. If borrowers' incomes stay the same or decrease, higher inflation makes it harder for them to pay off their debts, leading to an increase in non-performing loans. High inflation and interest rates also encourage borrowers to intentionally default on their loans (Funyina & Muhanga, 2021). GDP stands for the total worth of money of all the commodities and services generated in a nation over a specific period. Generally, the GDP growth rate is the most significant factor influencing non-performing loans. Borrowers experiencing an increase in income are more likely to be able to repay their loans. The annual GDP growth is a positive sign for banks, implying that their lending operations are functioning effectively (Awuor, 2015). Research, such as that by Al Masud and Hossain (2021), has explored the link between capital adequacy and non-performing loans. Aynalem (2016) supports the view that higher capital adequacy levels reduce the risk of losses from lending, thereby decreasing the incidence of non-performing loans.

**Independent variables** **Dependent variable**

**Liquidity**

* Current ratio
* Acid-Test Ratio

I**nflation**

* Consumer price index

**Non-performing loans**

* NPL ratio

**GDP**

* Real GDP data from BOT

**Capital adequacy**

* Capital adequacy ratio

Figure 2. : Conceptual Framework

**Source:** Empirical Literature Review

# CHAPTER THREE

# RESEARCH METHODOLOGY

# 3.1 Overview

This chapter discusses the many strategies utilized in conducting the research study, such as how data was acquired and how the study was conducted overall. It also outlines the study philosophy, design, population and sampling, data collection methods, and analysis. It also covers data validity and reliability, variables and their measurements, and ethical adherence.

# 3.2 Research Philosophy

As suggested by Marsonet (2019), this study used the positivist philosophy because it produces quantitative data, is concerned with hypothesis testing, and is extremely dependable. Positivism was also chosen because it is a philosophy of science that emphasizes the importance of observable facts and quantitative data (Wati, 2024). Positivism holds significant esteem within research due to its dedication to objective, empirical investigation, alongside its methodological precision. These elements collectively bolster research outcomes' credibility, reliability, and applicability. Nonetheless, it is imperative to note that Positivism involves scientific investigation and testing of the hypotheses to prove the reality (Saunders et al., 2019).

# 3.3 Research Design

The research employed an explanatory design. This design technique explains the relationship between the pairs of variables (Saunders et al., 2019). This design was selected as it aids in thoroughly understanding a problem by offering additional insights into a specific subject. The design helps to describe the cause-effect relationship between the independent and dependent variables (Baskerville & Pries-Heje, 2010). The explanatory design explains how liquidity, inflation, gross domestic product, and capital adequacy influence non-performing loans. The explanatory design described the magnitude of each independent variable influencing the dependent variable.

# 3.4 Research Approach

The research employed a deductive approach. It chose this approach because it offers greater flexibility in establishing connections between ideas and variables, quantifying concepts, and applying research outcomes to a certain extent (Saunders et al., 2019). The deductive approach is preferred due to its structured methodology, capacity to test and validate theories, objectivity, efficiency, and potential for generating precise predictions. This method is particularly advantageous in domains where established frameworks are available and can be systematically and empirically examined (Azungah, 2018).

# 3.5 Surveyed Population

A population is the pool from which a study's sample is drawn (Krieger, 2012). The study's population included 38 commercial banks in Tanzania, which have experienced an NPL challenge (BOT, 2023).

# 3.5 Area of the Research

This study was carried out in Tanzania's banking industry. Tanzanian commercial banks that conduct business were included in the study. This was done in commercial banks because Tanzania is a nation with many banks and has been reportedly dealing with non-performing loans (NPL). The NPL negatively influences banks' performance and economic growth (BOT, 2023).

# 3.6 Sampling Design and Procedures

A systematic sampling technique was used for the investigation. As recommended by Sullivan et al. (2024), this strategy was employed since the researcher chose banks of varying sizes for a certain study period. The banks chosen for the study took into account the data's accessibility throughout the chosen study period, which ran from 2019 to 2023. According to Bullen (2023), 10% or more of the entire target population was considered to be a decent representative sample.

The sampling frame consisted of the e 38 commercial banks operating in Tanzania that met the criteria for the study of non-performing loans, and it guided the selection of the sample for the research. The study's sample size comprised 27% of all commercial banks. Therefore, the sample size of the study was 10 commercial banks for the period of 2019 to 2023. This made 50 observations, as recommended by Longhi (2014), that for panel data analysis, there should be at least 30 observations.

# 3.7 Variables and Measurement Procedure

This section presents the measurement of variables. Key variables in this study examine the factors influencing non-performing loans (NPL) for commercial banks in Tanzania. The first variable is GDP measured by the GDP growth rate in a given year. GDP growth indicates a country's economic health and directly impacts the banking sector's performance. The second variable is Inflation (INF), defined by changes in average price levels. Inflation directly impacts the purchasing power of consumers, which can, in turn, affect the repayment ability of borrowers and thus influence NPL levels. Both GDP growth and inflation are measured as ratios, with data sourced from studies by Viswanadham (2015), Al Masud and Hossain (2021), Monicah (2011), and Msomi (2021).

Another set of variables focuses on the internal financial health of commercial banks. Capital adequacy (CA**)**is measured by the equity ratio to total assets. This ratio is sourced from studies by Aynalem (2016) and Funyina and Muhanga (2021). Liquidity (LIQ**)**, measured by the ratio of loans to deposits, describes commercial banks' ability to meet short-term expenditures and obligations. Finally, Non-Performing Loans (NPL**)** is the key dependent variable in the study, defined by the ratio of non-performing loans in a given year, which directly reflects banks' asset quality. The sources for these financial ratios include Msomi (2021), Akinola (2016), and Al Masud and Hossain (2021). All of these variables are measured on a ratio scale, capturing banks' relative performance and financial stability in relation to macroeconomic conditions. Table 3.1 summarizes the variables and the measurements of the study.

Table 3. 1: Measurement of Variables

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable** | **N0 of VRs** | **Code** | **Sub variables/ Measurement** | **Source** | **Type of scale/Data** |
| Gross Domestic Product | 1 | GDP | Rate of GDP growth in the year | Viswanadham (2015):  Al Masud and Hossain, (2021). | Ratio |
| Inflation | 1 | INF | changes in average price levels | Monicah (2011): Msomi (2021) | Ratio |
| Capital adequacy | 1 | CA | Equity divided to total assets | Aynalem (2016): Funyina and Muhanga (2021) | Ratio |
| Liquidity | 1 | LIQ | Loans to Deposits | Msomi (2022): Akinola , (2016) Fendi et al, (2017) | Ratio |
| NPL | 1 | NPL | Ratio of Nonperforming loan of the year | Msomi (2021)  Akinola (2016): Al Masud and Hossain, (2021) | Ratio |

# 3.8 Data collection Methods

The study is based on secondary data. Secondary data were collected using the internet-based panel data collected using the checklist. Panel data were derived from the income statements, statements of financial condition, and cash flow statements of ten commercial banks from 2019 to 2023. This study collected data from commercial banks' financial statements from 2019 to 2023.

**3.9 Data Processing**

This study involved collecting and translating data into useful knowledge. As per Heppner et al. (2015), this process entails a researcher transforming unprocessed data into a format that is easier to understand, like a graph, report, or chart, either by hand or with the help of a computer program. The procedure also includes merging all cluster data files into a single data file, transferring the data to the software, changing the variables to make the analysis easier, and creating the required tables for data analysis.

**3.10 Data Analysis**

This study used panel data, which was analyzed using correlation and regression analysis. After collecting the data, it was analyzed using the STATA 14.2 program. As a result, panel regression analysis was performed to see whether the independent variables significantly predicted the dependent variable, non-performing loans. A panel regression model was utilized, and NPL was stated as a function of loan to liquidity, GDP, capital adequacy, and inflation.

**Y**it = β0 + β1Χ1it + β2Χ2it + β3 Χ3it + β4 Χ4it +µit

Where;

Y = NPL

X1 = Inflation

X2 = Liquidity

X3 = GDP

X4 = Capital adequacy

β0 = Constant term of the equation

β1 – β3 = Coefficient of Determination for the model

µ = Random Error Term

i= commercial banks t = Time (number of years).

**Statistical Assumption/Test for regression model**

Before implementing the regression model for the analysis of data, it's crucial to ensure its validity and reliability through the execution of various statistical tests, including tests for heteroscedasticity, multicollinearity, and unit root (Mardiatmoko, 2024).

**Unit Root Test:** This part of the analysis employed the Augmented Dickey–Fuller (ADF) test to determine whether the data are stationary. Stationarity was indicated by a p-value below 0.05 (Herranz, 2017).

**Heteroscedasticity:** The research tested the existence of heteroscedasticity. The Breusch-Pagan or Cook-Weisberg test was utilized in this context. This test indicated that the data exhibited heteroscedasticity if the p-value within the 95% confidence intervals, and no heteroscedasticity if the p-value is above 0.05 (Đalić, I., & Terzić, 2021).

**Multicollinearity Test:** The presence of multicollinearity was assessed by calculating the Variance Inflation Factor (VIF). A VIF greater than 10 suggests the presence of multicollinearity, while a VIF less than 10 indicates the absence of such a problem (Ainiyah et al., 2016).

# 3.11 Reliability and validity of Study

The validity and reliability of this study are essential for ensuring that the findings on the factors affecting (NPL) in commercial banks are accurate and consistent. The study examined the relationships between bank-specific variables and NPL levels by using established financial ratios and data from reputable sources.

# 3.11.1 Validity

Following the Taherdoost et al. (2016)’s recommendations ensure validity, researchers also seek comments and input from other experts, peers, or stakeholders who can provide significant data insights or suggestions. Furthermore, to confirm the authenticity of data, the researcher compared and contrasted results with other relevant and reputable sources. In this case, the selected variables, such as GDP growth and capital adequacy, are directly relevant to the financial health of commercial banks, ensuring that the study accurately captures the factors affecting NPL levels. The study also uses peer-reviewed sources from reputable authors like Msomi (2021), Akinola (2016), and Al Masud and Hossain (2021), which enhances both the reliability and validity of the data. By applying these rigorous standards, the study aims to provide credible and meaningful insights into the dynamics of NPL in Tanzania’s banking sector.

# 3.11.2 Reliability

The reliability and validity ensure the accuracy and consistency of results on the NPLs Tanzanian commercial banks influencing factors. Reliability refers to the consistency of the measurements used in the study, ensuring that the results can be replicated under similar conditions (Lucas et al.,2023). To achieve this, the study relies on well-established data sources and standardized financial ratios such as GDP growth, inflation, capital adequacy, liquidity, and NPL, all of which have been widely used in previous research. To verify reliability, Cronbach's alphas were employed to test the scale's reliability or the variables' internal consistency. According to Shrestha (2021), an adequate reliability coefficient is α ≥ 0.7. The results of the alpha coefficient were 0.789, which suggested that the scale used had a good level of internal consistency because the tests above 0.7.

# 3.12 Ethical Consideration

This research was carried out while adhering to ethical guidelines, with the submission of an official letter from the Open University of Tanzania serving as a formal endorsement of my study. The principles of anonymity and confidentiality were upheld to guarantee that the data provided was solely for scholarly reasons. Furthermore, permission was also sought from chosen commercial banks to streamline the process of gathering data. Clearly, any data would only be utilized with the necessary consent.

Participants were requested to give their consent for the use of their information. They were able to participate in the study voluntarily. To safeguard the privacy of participants, the confidentiality of their information was a top priority. The researcher assured the participants that only they would be aware of who provided the information to the researcher. Additionally, to prevent any issues of plagiarism, the researcher properly cited all sources and acknowledged the original authors. The researcher took additional precautions to prevent any fabrication of data, ensuring that there was no deliberate distortion of the research findings. This was achieved through transparency and honesty regarding all aspects of the research, including data, analysis, and conclusions.

# CHAPTER FOUR

**FINDINGS AND DISCUSSION**

# 4.1 Overview

This chapter presents the study's findings. The previous chapter described the approach used by researchers to conduct empirical analysis and debates. As a result, this chapter presents an analysis and a discussion of the findings. This chapter covers correlation analysis, statistical assumptions, and regression analysis. Finally, the chapter discusses the findings.

# 4.2 Correlation Analysis

This section describes the correlation, which is used to determine the level of correlation between linearly connected variables. Correlation analysis is a method of statistics that identifies how strong and in which way a connection exists between two or more factors. It is useful for determining if a rise in one variable corresponds to an increase or decrease in another variable (Gogtay & Thatte, 2017). Table 4.1 presents an overview of the outcomes of the correlation study.

The results indicated a negative correlation between liquidity and other variables. The findings imply that liquidity correlates with other variables negatively. The results indicated a negative correlation between inflation and other variables. The findings imply that inflation correlates with other variables negatively. The results indicated a positive correlation between gross domestic product and other variables. The findings imply that gross domestic product correlates with other variables positively. The results indicated a positive correlation between capital adequacy and other variables. The findings imply that capital adequacy correlates with other variables positively. Understanding these relationships is crucial for policymakers, economists, and financial institutions, as they can inform decisions regarding monetary policy and regulatory frameworks.

Table 4. 1 Correlations

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variables | NPL | Liquidity | inflation | GDP | CAP |
| NPL | 1.000 |  |  |  |  |
| Liquidity | -0.4199 | 1.000 |  |  |  |
| Inflation | -0.3298 | 0.0114 | 1.0000 |  |  |
| GDP | 0.3813 | -0.0220 | 0.6168 | 1.0000 |  |
| CAP | 0.1191 | 0.1151 | -0.0380 | 0.0509 | 1.0000 |

**Source:** Field data (2024)

# 4.3 Tests for Statistical Assumptions

As a result, before using the model to assess the significance of the slopes and analyze the regressed result, multicollinearity, unit root, and heteroscedasticity tests are performed to discover misspecification of data, if any, to fulfill research quality.

# 4.3.1 Multicollinearity Test

Multicollinearity is a term used in multiple regression analysis to describe a scenario where two or more independent variables are closely related, suggesting they share similar insights into the variation of the dependent variable. Multicollinearity occurs when independent variables are closely linked. One method to assess multicollinearity is calculating the variance inflation factor (VIF). Generally, if the VIF values are above 10, it suggests the presence of multicollinearity (Ainiyah et al., 2016). The values listed in the Table 4.2 are all below 10, indicating no issue of multicollinearity.

**Table 4. 2 Multicollinearity**

|  |  |  |  |
| --- | --- | --- | --- |
| Variable | Coefficient  Variance | Uncentered  VIF | Centered  VIF |
| Liquidity | 3.8346306 | 1.808834 | 1.023795 |
| Inflation | 0.495686 | 127.6146 | 1.240594 |
| Gross domestic product | 0.040472 | 15.27772 | 1.231238 |
| Capital adequacy | 0.026555 | 98.43889 | 1.021599 |
| C | 0.001166 | 211.0109 | NA |

**Source:** Field Data (2024)

**4.3.2 Heteroskedasticity**

Heteroscedasticity is the idea that the variability of the dependent variable(s) remains consistent across all values of the independent variable(s) (Đalić & Terzić, 2021). The Breush-Pagan test and the White test were employed. The findings suggest that the null hypothesis cannot be proven because the p-values from the tests are significantly higher than 0.05. Therefore, it is concluded that there is no issue with heteroscedasticity, meaning no additional adjustments to the sample were necessary.

Table 4. : Heteroskedasticity results

|  |
| --- |
| Ho: Constant variance |
| Obs\*R-squared = 4.353223 |
| Prob. Chi-Square = 0.2258 |

**Source: Field Data (2024)**

# 4.3.3 Unit root test results

A unit root test is a statistical technique to ascertain if a time series variable is non-stationary and contains a unit root (Đalić & Terzić, 2021). The presence of a unit root suggests that fluctuations in the series' level can lead to lasting impacts rather than fading away over time (Maddala & Wu). Identifying a unit root is essential in time series analysis, particularly in econometrics and finance, as it affects the selection of modeling strategies and how data is interpreted (Pesaran, 2007). Stationarity means that a variable's average, variance, and correlation remain constant over time (Choi, (2001). In this research, the stationarity of the data is examined through an ADF type-a unit root test for unbalanced panels, as proposed by Đalić andTerzić (2021), where a p-value exceeding 5% signals the presence of a unit root, indicating non-stationarity and a p-value below 5% suggests the absence of a unit root, indicating stationarity. The findings in Table 4.5 below show that all variables are stationary after taking the first difference. The results suggest no issue with the presence of a unit root.

Table 4. Unit root test

|  |  |  |
| --- | --- | --- |
| Variable | p-value | Remarks |
| Liquidity | 0.0000 | Stationary |
| Inflation | 0.0001 | Stationary |
| Gross domestic product | 0.0000 | Stationary |
| Capital adequacy | 0.0000 | Stationary |

**Source:** Field Data (2024)

# 4.4 Regression Analysis

Regression analysis is a method of statistics employed to explore the connections among two or more factors (Sarstedt et al., 2019). It enables the researcher to comprehend the typical change in the value of the dependent factor as one of the independent factors is altered while the rest remain constant (Saxena et al., 2024). Regression analysis evaluated the link between the independent and dependent factors. Regression analysis involves evaluating the model's fit, determining its statistical significance, and calculating the model's estimated coefficients (Sarstedt et al., 2019). The summary of the results of regression is shown in Table 4.5.

**Table 4. 5 Regression Results**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Non-performing loan | Coef. | Std. Err. | T | P-value |
| Liquidity | -.0088193 | .0019578 | -4.50 | 0.000 |
| Inflation | -2.184041 | .7040499 | -3.10 | 0.003 |
| Gross domestic product | .424366 | .2011771 | 2.11 | 0.041 |
| Capital adequacy | .215365 | .1629563 | 1.32 | 0.193 |
| \_cons | .1037833 | .0341524 | 3.04 | 0.004 |
| Prob > F = 0.0000 | | | | |
| R-squared = 0.5924 | | | | |
| Adjusted R-squared = 0.5205 | | | | |

**Source: Field Data (2024)**

The researcher found that the R-Square value was 0.5924, suggesting that liquidity, inflation, Gross domestic product, and capital adequacy collectively accounted for 59.24% of the variation observed in the dependent variable, which was non-performing loans. Additionally, the analysis revealed that the adjusted R-squared of the model was 0.5205, indicating that linear regression explains 52.05% of the data's variance. Given that the R-Square exceeds 50%, it can be concluded that the regression model was half correctly specified. Moreover, the findings indicate that the probability of the F-statistic was 0.0000, which was less than 0.05, demonstrating that the overall model effectively predicted the dependent variable. The findings suggest that at least one of the independent variables (liquidity, inflation, Gross domestic product, capital adequacy) influenced the dependent variable (non-performing loans).

Furthermore, the analysis revealed that liquidity significantly affected non-performing loans. The estimated p-value for liquidity was 0.000, less than 5%, indicating that the coefficient was statistically significant. Therefore, at a 5% significance level, the study concludes that liquidity significantly influenced non-performing loans. The study also found that inflation significantly affects non-performing loans. Moreover, the estimated p-value for inflation was 0.003, which was less than 0.05, suggesting that the coefficient was statistically significant. Thus, at a 5% significance level, the study concludes that inflation had a significant relationship with non-performing loans.

The study also revealed that Gross domestic product significantly influenced non-performing loans. Moreover, the calculated p-value for Gross domestic product is 0.0411, below 0.05, suggesting that the relationship was statistically meaningful. Thus, with a 5% significance level, the research concludes that Gross domestic product was a significant factor that affected non-performing loans.

However, the study found that capital adequacy did not significantly affect non-performing loans. Moreover, the estimated p-value for capital adequacy is 0.193, greater than 0.05, suggesting that the coefficient was not statistically significant. Thus, at a 5% significance level, the study concludes that capital adequacy did not significantly influence non-performing loans. The results imply that capital adequacy did not significantly contribute to the increase in non-performing loans. The final regression model is written as follows:

Non-performing loan= .1037833 + -.008819LIQ + -2.184041INFL+.424366GDP + .215365CAP +є

# 4.5 Discussion of Findings

The earlier parts of the text outlined the main findings of the research. Consequently, this part explores the detailed examination of the data associated with each explanatory factor. Moreover, the discussions concentrate on the research's statistical outcomes compared to previous empirical studies. Therefore, the following section illustrate the relationship between variables.

# 4.5.1 Impact of Liquidity on the non-performing loans

The study determined the impact of liquidity on non-performing loans in Tanzania. The regression results showed that liquidity greatly influenced non-performing loans in Tanzania. The results show that liquidity was significant in non-performing loans. The estimated coefficient of liquidity was -.0088193. The findings suggest that a one-unit increase in liquidity would result in a decrease in non-performing loans by -.0088193 units.

The calculated p-value is 0.000, less than 5%, indicating that the estimated coefficient was statistically significant. The findings also suggest that liquidity and non-performing loans (NPLs) were closely linked elements of a bank's or financial institution's overall health. Liquidity was typically linked to cash or assets that can be quickly converted to fulfill short-term financial needs. However, its effect on NPLs can be intricate and occasionally detrimental. In general, liquidity was crucial for the efficient operation of financial markets. However, an excess of it can result in more lenient lending standards and a rise in NPLs. The conclusion aligns with the research conducted by Onyango and Olando (2020) on how specific factors within banks affect NPLs among commercial banks in Kenya. A quantitative approach was employed to generate descriptive statistics, and inferential analysis was used to develop a model for predicting NPLs based on bank-related factors. The findings indicate that a low liquidity ratio was associated with a negative significant relationship with NPLs, and a negative significant relationship existed between return on assets (ROA) and NPLs among commercial banks in Kenya. ROA negatively affects.

Banks with sufficient liquid assets are better equipped to handle their loan collections and offer the needed assistance to borrowers experiencing short-term money problems, lowering the amount of non-performing loans (NPLs). On the other hand, during periods of limited liquidity, financial organizations might enforce stricter loan criteria or raise interest rates, resulting in more defaults by borrowers and, as a result, a rise in NPLs. Moreover, banks might become more reluctant to provide loans, worsening the financial strain on borrowers.

# 4.5.2 Impact of inflation on the non-performing loans

The study determined the impact of inflation on non-performing loans in Tanzania. The regression results showed that inflation had a significant relationship with non-performing loans. The estimated coefficient of inflation, denoted as -2.184041, suggests that for every unit increase in inflation, there would be a corresponding decrease of -2.184041 units in non-performing loans. Furthermore, the estimated p-value of 0.003 is less than 0.05, indicating that the estimated coefficient is statistically significant. Rising inflation might negatively impact non-performing loans (NPLs), as increasing inflation could enhance borrowers' ability to afford their loans by reducing the real value of their outstanding debt. Inflation can create a difficult economic situation that hampers borrowers' capacity to fulfill their loan commitments, potentially leading to rising NPLs and significant financial losses for banks.

These conclusions align with Ibish et al. (2018), who explored the factors influencing the extent of NPLs in commercial banks of emerging economies. Their research indicates that GDP growth, inflation, and operational efficiency are significantly linked to NPL levels, whereas unemployment is found to have a positive association with NPLs. On average, a moderate inflation rate benefits borrowers, which might boost their loan repayment capacity. Nonetheless, if inflation surpasses wage increases, it could lead to elevated living expenses, diminishing consumers' available funds and potentially causing an uptick in loan defaults. In situations characterized by high inflation, the actual value of debt could suffer if borrowers' earnings fail to keep up with escalating expenses. This could result in higher NPL rates as borrowers find it challenging to fulfill their financial obligations.

# 4.5.3 Impact of Gross domestic product on the non-performing loans

The study examined the impact of gross domestic product on the non-performing loan in Tanzania. The regression results showed that gross domestic product was significantly related to non-performing loans. The estimated coefficient of gross domestic product was .424366. The results suggest that a one-unit increase in the Gross Domestic Product (GDP) would correspond to a .424366-unit change in the Non-Performing Loan (NPL). Furthermore, the estimated p-value is 0.041, less than 0.05, indicating that the estimated coefficient was statistically significant. The study implies that when a country's economy grows positively, it often results in better financial situations for individuals and companies, lowering the number of loans that fail to be repaid. Nathan et al. (2020) supported this and looked into the factors that influence loans that were not repaid in Uganda's banking sector. They analyzed the data using advanced statistical methods. They found that higher interest rates, a weaker local currency, and higher unemployment rates tend to lead to more loans that are not repaid.

On the other hand, higher returns on investments and economic growth can help reduce the number of such loans. Apan and Islamoglu (2019) also discovered that strong economic growth usually means more money for borrowers, which helped them better manage their debts, leading to fewer defaults and lower non-performing loan rates. However, when the economy slows down, the chances of loan defaults increase, the same as non-performing loans.

In general, a growing economy means more people have jobs and earn more money, which makes it less likely for them to default on their loans. This is why non-performing loan rates tend to go down during these times. On the flip side, when the economy is in a slump or not growing, unemployment rates go up, and people's incomes decrease, making it more likely for them to default on their loans, increasing the rates of non-performing loans.

# 4.5.4 Impact of Capital adequacy on the non-performing loans

The study examined the impact of capital adequacy on non-performing loans in Tanzania. The regression results showed that capital adequacy had no significant relationship with non-performing loans. The estimated coefficient of capital adequacy was .215365. The findings suggest that a one-unit increase in capital adequacy would result in a corresponding 0.215365 units change in the non-performing loan. Furthermore, the estimated p-value is 0.193, greater than the significance level of 0.05, indicating that the estimated coefficient was statistically insignificant. The importance of having enough capital for a bank's financial stability cannot be overstated. However, it might not be the sole factor in preventing the rise of loans that did not perform as expected.

The way a bank handles credit risk, the broader economic environment, and its approach to lending is more directly linked to the levels of non-performing loans.

Funyina and Muhanga (2021) also backed the research findings by exploring the causes of non-performing loans in Zambia. Their study showed that non-performing loans could be traced back to specific factors related to the bank, such as capital levels and interest rates, and broader economic conditions like unemployment. The study also found that a weakening of the local currency, the Kwacha, significantly increased non-performing loans across all types of banks, including large and international ones. However, it had the opposite effect on smaller, local banks. However, the impact of capital adequacy on non-performing loans was found to be less pronounced.

Banks with solid capital positions can better handle the losses from non-performing loans without disrupting their operations. They also have the means to take a more active role in managing troubled loans (Swandewi & Purnawati, 2021). Banks that lack sufficient capital may find it difficult to manage these losses, leading to stricter lending policies and potentially harsher measures against borrowers, such as foreclosures, which could, in turn, lead to even higher levels of non-performing loans (Yulianti et al., 2018).

**CHAPTER FIVE**

**SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS**

# 5.1 Overview

This chapter intends to draw conclusions and coverage guidelines based on research findings. It offers the findings' results and draws a few conclusions that eventually require recommendations. Furthermore, it suggests further areas for the study.

# 5.2 Summary of Findings

This section presents a summary of the findings. The summary of findings is presented based on specific objectives.

# 5.2.1 Impact of liquidity on non-performing loans

The study determined the influence of liquidity on non-performing loans in Tanzania. The regression results showed Liquidity significantly influences non-performing loans in Tanzania. The results showed that liquidity significantly influenced non-performing loans with a p-value of 0. 000, less than 5%. The findings also imply that liquidity and non-performing loans (NPLs) were closely linked elements of a bank's or financial institution's overall health. Liquidity is typically linked to cash or assets that can be quickly converted to fulfill short-term financial needs. However, its effect on NPLs could be occasionally detrimental. In general, liquidity is crucial for the efficient operation of financial markets. However, an excess of it can result in more lenient lending standards and a rise in NPLs.

# 5.2.2 Impact of inflation on non-performing loans

The study determined the impact of inflation on non-performing loans in Tanzania. The regression results showed inflation had a significant relationship with non-performing loans with a p-value of 0.003, less than 0.05. The findings imply that rising inflation might negatively impact non-performing loans (NPLs), as increasing inflation could enhance borrowers' ability to afford their loans by reducing the real value of their outstanding debt. Inflation can create a difficult economic situation that hampers borrowers' capacity to fulfill their loan commitments, potentially leading to rising NPLs and significant financial losses for banks.

# 5.2.3 Impact of gross domestic product on non-performing loans

The study examined the influence of gross domestic product on non-performing loans in Tanzania. The regression results showed that gross domestic product had a significant relationship with non-performing loans, with a p-value of 0.041, less than 0.05. The study implies that when a country's economy grows positively, it often results in better financial situations for individuals and companies, lowering the number of loans.

# 5.2.4 Impact of capital adequacy on non-performing loans

The study examined the influence of capital adequacy on non-performing loans in Tanzania. The regression results showed that capital adequacy had no significant relationship with non-performing loans with a p-value of 0.193, greater than 0.05. The importance of having enough capital for a bank's financial stability cannot be overstated. However, it might not be the sole factor in preventing the rise of loans that do not perform as expected. The way a bank handles credit risk, the broader economic environment, and its approach to lending is more directly linked to the levels of non-performing loans.

# 5.3 Conclusions

The study concludes that liquidity and inflation negatively and significantly affect non-performing loans in Tanzania. However, the study concludes that capital adequacy and gross domestic product significantly positively and significantly affected the non-performing loans for the Tanzanian commercial banks.

The findings imply that banks can better manage their lending portfolios and reduce the likelihood of defaults when they have sufficient liquidity. Similarly, the negative impact of inflation on NPLs highlights the challenges posed by price rises, which increase the probability of loan default. On the other hand, the positive and significant relationship between capital adequacy and NPL indicates that higher equity relative to total assets helps banks absorb potential loan losses, thus improving their resilience and reducing the likelihood of loan defaults. The study also finds that GDP growth has a significant positive effect on NPLs, suggesting that during periods of economic expansion, commercial banks may increase lending, which could also result in a higher risk of defaults as loan volumes rise.

# 5.4 Recommendations

This section presents the recommendations of the study as follow;

# 5.4.1 Practical/General recommendations

The study concludes that liquidity and inflation negatively and significantly affect non-performing loans in Tanzania. However, the study concludes that capital adequacy and gross domestic product significantly positively and significantly affected the non-performing loans for the Tanzanian commercial banks. The results imply that keeping the liquidity ratio at the required level makes commercial banks less likely to have a high NPL ratio. This means that banks with higher liquidity are more likely to try to address unpaid loans since they have more funds available for operations, highlighting the importance of effective loan management. Moreover, for banks to maintain liquidity, it's essential to focus on thorough and strict loan management to ensure thorough checks are conducted before loans are given out. Additionally, the Bank of Tanzania should enhance its oversight system to incorporate macroeconomic indicators like GDP when assessing the banking sector's stability and resilience. A higher GDP growth rate typically leads to increased income for borrowers, which in turn improves their ability to repay debts, resulting in lower NPLs. A rise in GDP can also help borrowers enhance their financial situations and repay their debts.

# 5.4.2 Implications

**Policy makers Implications**:

Stakeholders in the credit system, such as financial institutions and the state, must enact strategies that enable the management of macroeconomic and specific factors that lead to Non-Performing Loans (NPLs). The research suggests that financial institutions should establish a transparent policy structure that tackles issues related to conflicts of interest and ethical norms and ensures accountability in all parties' decision-making in the credit process to guarantee its execution. Financial institutions must understand that elevated NPL levels present a significant risk to the institution and the broader financial system.

In collaboration with other stakeholders in the economy, the government needs to recognize the danger that delinquent loans present not just to the banking industry but to the overall economy. The government should be aware that NPLs can lead to the downfall of the banking industry and the entire economy. Also, results from these research projects can guide regulatory agencies and decision-makers in developing successful monetary and fiscal strategies. By identifying the factors that lead to non-performing loans (NPLs), authorities can take action to steady the financial sector and promote borrowing, particularly in times of economic recession.

**Implications for Industry:** Banks are required to enhance their strategies for assessing and managing credit risk. This enhancement may necessitate the adoption of more advanced models for evaluating the risk associated with borrowers alongside the diversification of loan portfolios. Cultivating robust relationships with borrowers can significantly contribute to improved loan performance. Implementing technological solutions, such as credit scoring systems and loan monitoring tools, can assist banks in identifying loans at risk early on and implementing corrective measures. Furthermore, investing in the training of loan officers and risk management personnel can elevate the quality of the loan approval process and augment the decision-making abilities concerning lending. Banks are also encouraged to collaborate closely with governmental entities to promote a stable economic climate and mitigate external factors contributing to Non-Performing Loans.

**Implications for Academics on theory development:** There exists an opportunity to construct thorough theoretical frameworks aimed at comprehending the dynamics of Non-Performing Loans (NPLs), taking into account socio-economic factors, characteristics of borrowers, and variables specific to banks within the context of Tanzania. Future scholarly investigations could concentrate on assessing the influence of particular policy interventions on NPL rates in Tanzania, thereby contributing to the existing body of knowledge on effective policy strategies. Researchers are encouraged to develop or enhance models for forecasting NPL rates, utilizing local economic indicators, patterns of borrower behavior, and banking practices. Furthermore, executing case studies on banks that have successfully managed NPLs could yield significant insights and best practices, which could be shared across academic and professional communities.

# 5.4.3 Contribution of the Study to the Theories

This study makes a valuable contribution to the Business Cycle and Non-Performing Loans (NPLs) Theory by highlighting the dynamic relationships between factors influencing NPL. By demonstrating that liquidity and inflation have a negative and significant effect on NPLs in Tanzania, the study supports the view that tighter liquidity and higher inflation can increase financial strain on borrowers, leading to higher default rates during economic downturns. Furthermore, the positive relationship between capital adequacy and NPLs aligns with the theory that banks with stronger capital buffers are better able to withstand economic shocks, thereby mitigating the impact of rising defaults. The significant positive effect of Gross Domestic Product (GDP) on NPLs also reinforces the idea that economic growth, while boosting lending activity, may expose banks to higher risks if the expansion is not matched by sufficient risk management. This contribution enriches the understanding of how business cycle fluctuations-through factors like inflation, liquidity, and GDP—interact with bank-specific variables to influence the health of the financial sector, particularly with respect to loan defaults.

# 5.5 The limitations of the study

Secondary data may face a challenge of data inconsistencies, missing entries, or reporting errors by Tanzanian commercial banks could introduce bias into the results. Furthermore, while the study focuses on key variables such as liquidity, inflation, capital adequacy, and gross domestic product (GDP), it omits other potentially influential factors, such as interest rates, exchange rates, regulatory changes, or bank-specific characteristics. These exclusions limit the analysis's comprehensiveness and the model's explanatory power.

Another limitation is that the interaction between macroeconomic indicators and non-performing loans (NPLs) can be complex and reciprocal, and the regression results may not fully capture these dynamics. Additionally, the study's findings are context-specific and may not be generalizable beyond Tanzania's banking system. Differences in regulatory environments, economic structures, and banking practices across countries mean the conclusions may not apply universally.

The panel data's time horizon also presents a limitation. If the dataset covers only a short period, it may not reflect long-term trends or structural changes within the banking sector or the broader economy. Moreover, macroeconomic shocks, such as global financial crises or pandemics, might not have been adequately incorporated into the analysis, potentially skewing the findings. Similarly, inflation and its effects on NPLs may vary across banks depending on their customer profiles and loan structures, which aggregate data cannot fully capture.

Lastly, methodological limitations could impact the robustness of the findings. The regression model's assumptions-such as linearity, normality of residuals, and absence of multicollinearity=might not hold, leading to biased or inconsistent results. the data may contain the omitted variables. These limitations justify the need for further research, potentially involving expanded datasets, more sophisticated econometric techniques, and consideration of additional variables to provide deeper insights into the determinants of NPLs in Tanzania.

# 5.5 Direction for Further Studies

Future studies on non-performing loans (NPLs) in Tanzanian commercial banks should expand upon the scope and depth of the current research to address its limitations and provide a more comprehensive understanding of the factors influencing NPLs. Researchers could incorporate variables like interest rates, exchange rate volatility, loan portfolio composition, and bank-specific factors like management quality and operational efficiency. Including these variables would provide a broader perspective on the determinants of NPLs and capture nuances that may vary between banks.

Furthermore, future studies should consider extending the time frame of the analysis to include long-term trends and structural changes in the banking sector. This would help to identify patterns that might only emerge over extended periods and provide insights into how external shocks, such as global financial crises or pandemics, influence NPLs. To understand sector-specific vulnerabilities, researchers could also explore how different macroeconomic conditions affect various categories of loans, such as corporate, retail, and agricultural loans.

Future research should adopt advanced econometric techniques, such as dynamic panel models, to strengthen causal inferences. These methods can better account for potential endogeneity, reverse causality, and the dynamic nature of relationships between variables. Incorporating stress-testing scenarios or simulations could provide valuable insights into how banks respond to economic shocks or policy changes.

Additionally, comparative studies involving other countries in East Africa or similar emerging economies could offer a broader perspective and identify region-specific or universal trends. Such cross-country analyses would help policymakers understand whether the observed relationships are unique to Tanzania or indicate broader patterns in developing economies. Lastly, qualitative approaches, such as case studies or interviews with bank executives and regulators, could complement quantitative findings by uncovering insights into the institutional and operational challenges contributing to NPLs

# REFERENCES

Adegbie, F. F., & Dada, O. T. (2018). Risk assets management, liquidity management and sustainable performance in Nigeria deposit money banks. International Journal of Accounting Research, 6(2), 1-10.

Ahmad, A., Khan, I., Khan, M. T., & Ilyas, M. (2018). The impact of GDP, inflation, exchange rate, unemployment and tax rate on the non performing loans of banks: Evidence from Pakistani commercial banks. Journal of Social Sciences and Humanities, 26(2), 141-164

Ainiyah, N., Deliar, A., & Virtriana, R. (2016). The classical assumption test to driving factors of land cover change in the development region of northern part of west Java. The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, 41, 205-210.

Akhter, N. (2023). Determinants of commercial bank’s non-performing loans in Bangladesh: Empirical evidence. Cogent Economics & Finance, 11(1), 2194128.

Al Masud, A. & Hossain, M.A. (2021). Determinants of Non-Performing Loan (NPL): A Case of an Emerging Economy’, Southeast Business Review, 10(1), 46-60.

Al Masud, A., & Hossain, M. A. (2021). Determinants of Non Performing Loan (NPL): A Case of an Emerging Economy. Al Masud, A. & Hossain, MA, (2020). Determinants of Non Performing Loan (NPL): A Case of an Emerging Economy’, Southeast Business Review, 10(1), 46-60.

Alnabulsi, K., & Kozarevic, E. (2021). Interdependence between non-performing loans, financial stability and economic growth. In 10th International Scientific Symposium on Region, Entrepreneurship, Development (RED) (pp. 575-591).

Anjom, W., & Karim, A. M. (2016). Relationship between non-performing loans and macroeconomic factors with bank specific factors: a case study on loan portfolios–SAARC countries perspective. ELK Asia Pacific Journal of Finance and Risk Management, 7(2), 1-29.

Apostolik, R., & Donohue, C. (2015). Foundations of Financial Risk: an overview of financial risk and risk-based financial regulation, 2nd edition. Wiley Finance. John Wiley and Sons, New Jersey and Canada, 44-47.

Arham, N., Salisi, M. S., Mohammed, R. U., & Tuyon, J. (2020). Impact of macroeconomic cyclical indicators and country governance on bank non-performing loans in Emerging Asia. Eurasian Economic Review, 10, 707-726.

Asfaw, A. S., Bogale, H. N., & Teame, T. T. (2016). Factors affecting non-performing loans: Case study on development bank of Ethiopia central region. International Journal of Scientific and Research Publications, 6(5), 656–670.

Awuor, F. (2015). Effects of selected bank specific factors on non-performing loans amongst commercial banks in Kenya (Doctoral dissertation, University of Nairobi)

Aynalem, S. (2016). Factors Affecting Non-Performing Loans in Commercial Bank of Ethiopia. Available at SSRN 3215668.

Azungah, T. (2018). Qualitative research: deductive and inductive approaches to data analysis. Qualitative research journal, 18(4), 383-400.

Baskerville, R., & Pries-Heje, J. (2010). Explanatory design theory. Business & Information Systems Engineering, 2, 271-282.

BOT (2022). Tanzania Financial Stability Report, December, 2022

BOT (2023). Tanzania Financial Stability Report, December, 2023

Brastama, R. F., & Yadnya, I. P. (2020). The effect of capital adequacy ratio and non performing loan on banking stock prices with profitability as intervening variable. American Journal of Humanities and Social Sciences Research,, 4(12), 43-49.

Bullen, P, B. (2023). How to choose a sample size (for the statistically challenged). [https://tools4dev.org/resources/how-to-choose-a-sample-size/], 30/09/2024.

Caporale, G.M., Alessi, M., Di Colli, S & Lopez, J.S. (2015), “Loan Loss Provision: Some Empirical Evidence for Italian Banks” CESifo Working Paper Series No. 5253. March 30. Available at SSRN: https://ssrn.com/abstract=2591834

Choi, I. (2001). Unit root tests for panel data. Journal of international money and Finance, 20(2), 249-272.

Cowling, N. (2024). Non-performing loans ratio in Tanzania 2012-2022. [https://www.statista.com/statistics/1316881/non-performing-loans-ratio-in-tanzania/], 30/09/2024

Đalić, I., & Terzić, S. (2021). Violation of the assumption of homoscedasticity and detection of heteroscedasticity. Decision Making: Applications in Management and Engineering, 4(1), 1-18.

Džidić, A., Živko, I., & Čolak, A. (2022). Macroeconomic Factors of Non-Performing Loans: The Case of Bosnia and Herzegovina. Ekonomska misao i praksa, 31(2), 421-438.

Fernando, U. C. K., & Rathnasiri, R. A. (2019). The Determinants of the Level of Nonperforming loans in Commercial Banks of Sri Lanka with Special Reference to Puttalam District. In Sri Lanka Economic Research Conference (SLERC) 2019 (p. 98).

Funyina, T. K., & Muhanga, I. (2021). The Determinants of Non-Performing Loans in Zambia: Impact of Bank-Specific and Macroeconomic Variables. Journal of Applied Finance and Banking, 12(4), 382-871

Gabriel, O., Victor, I. E., & Innocent, I. O. (2019). Effect of Nonperforming loans on the Financial Performance of Commercial Banks in Nigeria. American International Journal of Business and Management Studies, 1(2), 1-9.

Gogtay, N. J., & Thatte, U. M. (2017). Principles of correlation analysis. Journal of the Association of Physicians of India, 65(3), 78-81.

Heale, R., & Twycross, A. (2015). Validity and reliability in quantitative studies. Evidence-based nursing, 18(3), 66-67.

Helgilibrary (2024). Non-Performing Loans (As % of Total Loans) in Tanzania [https://www.helgilibrary.com/indicators/non-performing-loans-as-of-total-loans/tanzania/], 13/11/2024

Heppner, P. P., Wampold, B. E., Owen, J., & Wang, K. T. (2015). Research design in counseling. Cengage Learning.

Herranz, E. (2017). Unit root tests. Wiley Interdisciplinary Reviews: Computational Statistics, 9(3), e1396.

IMF. (2019). IMF Surveillance. Retrieved from IMF Official Website: https://www.imf.org/en/About/Factsheets/IMF-Surveillance

IMF. (2022). Non-Performing Loans in the ECCU: Determinants and Macroeconomic Impact. Africa Hemisphere: International Monetary Fund.

Kartikasary, M., Marsintauli, F., Serlawati, E., & Laurens, S. (2020). Factors affecting the non-performing loans in Indonesia. Accounting, 6(2), 97-106.

Keitshokile, T. (2020). The determinants of credit risk of commercial banks in Botswana. Journal of business, 4(6), 543-987

Khan, M. A. (2011). Threshold Effects in the Relationship between Inflation and Growth. Interntional Monetary Fund.

Kish, L. (2017). Some statistical problems in research design. In Research Design (pp. 64-78). Routledge.

Klein, N. (2013). Non-performing loans in CESEE: Determinants and impact on macroeconomic performance. International Monetary Fund Working Paper,/13/72.

Krieger, N. (2012). Who and what is a “population”? Historical debates, current controversies, and implications for understanding “population health” and rectifying health inequities. The Milbank Quarterly, 90(4), 634-681.

Kurumi, L., & Bushpepa, O. (2017). Do macroeconomic variables affect the level of nonperforming loans? In Sixth Conference of Students of the Agricultural University of Tirana. Tirana, https://drive. google. Com/file/d/0B0H5Y5y03xiZdlFxbDE5UjZqMk0/view.

Kydland, F. E., & Prescott, E. C. (1982). Time to build and aggregate fluctuations. Econometrica: Journal of the Econometric Society, 1345-1370.

Longhi, S. (2014). A practical guide to using panel data. [https://www.torrossa.com/gs/resourceProxy?an=5019566&publisher=FZ7200], 22/10/2024.

Lucas, N., Macaskill, P., Irwig, L., Moran, R., Rickards, L., Turner, R., & Bogduk, N. (2013). The reliability of a quality appraisal tool for studies of diagnostic reliability (QAREL). BMC medical research methodology, 13, 1-6.

Lumpkin, S. (2011). Risks in financial group structures. OECD Journal: Financial Market Trends, 2010(2), 105-136.

Maddala, G. S., & Wu, S. (1999). A comparative study of unit root tests with panel data and a new simple test. Oxford Bulletin of Economics and statistics, 61(S1), 631-652.

Mahyoub, M., & Said, R. M. (2021). Factors Influencing Non-Performing Loans: Empirical Evidence from Commercial Banks in Malaysia. Research Journal of Business and Management, 8(3), 160-166.

Malimi, K. (2017). The influence of capital adequacy, profitability, and loan growth on non-performing loans a case of Tanzanian banking sector. International Journal of Economics, Business and Management Studies, 4(1), 38-49.

Mardiatmoko, G. (2024). The Application of the Classical Assumption Test in Multiple Linear Regression Analysis (a Case Study of the Preparation of the Allometric Equations of Young Makila). Jurnal Teori dan Aplikasi Matematika, 8(3), 724-739.

Marsonet, M. (2019). Philosophy and logical positivism. Academicus International Scientific Journal, 10(19), 32-36.

Mazorodze, B. T. (2017). Real exchange rate misalignment and growth of tradable sectors in South Africa: A sectoral dynamic panel dataapproach (Doctoral dissertation, University of Zululand).

Mdaghri, A., A. (2022). How does bank liquidity creation affect non-performing loans in the MENA region?. International Journal of Emerging Markets, 17(7), 1635-1658.

Merna, T. & Njiru, C. (2002), Financing infrastructure project, London Thokas Telford

Msomi, T. S. (2022). Factors affecting non-performing loans in commercial banks of selected West African countries. Banks and Bank Systems, 17(1), 1-76.

Muriithi, J. W. (2014). The effect of Non Performing Loans on liquidity risk of commercial banks in Kenya (Doctoral dissertation, University of Nairobi).

Mustafa, S. A., & Ali, M. (2019). Macroeconomic Factors Influence on Non-Performing Loans: The Case of Commercial Banks in Malaysia. International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies, 10(17), 1-11.

Nadham, V., & Nahid, B. (2015). Determinants of non performing loans in commercial banks: A study of NBC Bank Dodoma Tanzania. International Journal of Finance & Banking Studies (2147-4486), 4(1), 70-94.

Nathan, S., Ibrahim, M., & Tom, M. (2020). Determinants of non-performing loans in Uganda’s commercial banking sector. African Journal of Economic Review, 8(1), 26-47.

Nugroho, M., Arif, D., & Halik, A. (2021). The effect of loan-loss provision, non-performing loans and third-party fund on capital adequacy ratio. Accounting, 7(4), 943-950.

Onyango, W. A., & Olando, C. O. (2020). Analysis on influence of bank specific factors on non-performing loans among commercial Banks in Kenya. Advances in Economics and Business, 8(3), 105-121.

Ouhibi, S., & Hammami, S. (2015). Determinants of nonperforming loans in the Southern Mediterranean countries. International Journal of Accounting and Economics Studies, 3(1), 50-53

Pesaran, M. H. (2007). A simple panel unit root test in the presence of cross‐section dependence. Journal of applied econometrics, 22(2), 265-312.

Pop, I. D., Cepoi, C. O., & Anghel, D. G. (2018). Liquidity-threshold effect in non-performing loans. Finance research letters, 27, 124-128.

Ptasica, T. (2019). Modeling the influence of inflation on the level of non-performing loans in Cyprus commercial banks. Technological Audit and Production Reserves, 1(5 (45)), 36-38.

Sarstedt, M., Mooi, E., Sarstedt, M., & Mooi, E. (2019). Regression analysis. A concise guide to market research: The process, data, and methods using IBM SPSS Statistics, 209-256.

Saxena, A., Sabillon-Orellana, C., & Prozzi, J. (2024). Prediction of compressive strength in sustainable concrete using regression analysis. Journal of Material Cycles and Waste Management, 26(5), 2896-2909.

Shrestha, N. (2021). Factor analysis as a tool for survey analysis. American journal of Applied Mathematics and statistics, 9(1), 4-11.

Sinaga, J. S., Muda, I., & Silalahi, A. S. (2020). The effect of BI rate, exchange rate, inflation and third party fund (DPK) on credit distribution and its impact on non performing loan (NPL) on XYZ commercial segment bank. Universal Journal of Accounting and Finance, 8(3), 55-64.

Sullivan, K. A., Farrokhyar, F., Leontiadis, G. I., Patel, Y. S., Churchill, I. F., Hylton, D. A., ... & Hanna, W. C. (2022). Routine systematic sampling versus targeted sampling during endobronchial ultrasound: a randomized feasibility trial. The Journal of Thoracic and Cardiovascular Surgery, 164(1), 254-261.

Swandewi, N. K. M., & Purnawati, N. K. (2021). Capital adequacy ratio mediates the effect of non-performing loan on returns on assets in public commercial banks. American Journal of Humanities and Social Sciences Research 5(1), 651-656.

Taherdoost, H. (2016). Validity and reliability of the research instrument; how to test the validation of a questionnaire/survey in research. International Journal of Academic Research in Management, 5(3), 28-36.

Taiwo, I., & Mike, M. E. E. (2021). Empirical Analysis of non-performing loans and liquidity of deposit money banks: Nigeria experience. Journal of International Business and Management, 4(9), 01-14.

Tham, K. W., Said, R., & Adnan, Y. (2021). The dynamic relationship between inflation and non-performing property loans in Malaysia. Journal of Surveying, Construction and Property, 12(1), 36-44.

Umar, M., & Sun, G. (2016). Non-performing loans (NPLs), liquidity creation, and moral hazard: Case of Chinese banks. China Finance and Economic Review, 5(3), 51-75.

Wati, R. (2024). Analyzing and Viewing the Development of Construction of the Philosophical View of Positivism. Journal of World Science, 3(8), 906-913.

Yulianti, E., Aliamin, A., & Ibrahim, R. (2018). The effect of capital adequacy and bank size on non-performing loans in Indonesian public banks. Journal of Accounting Research, Organization and Economics, 1(2), 205-214.

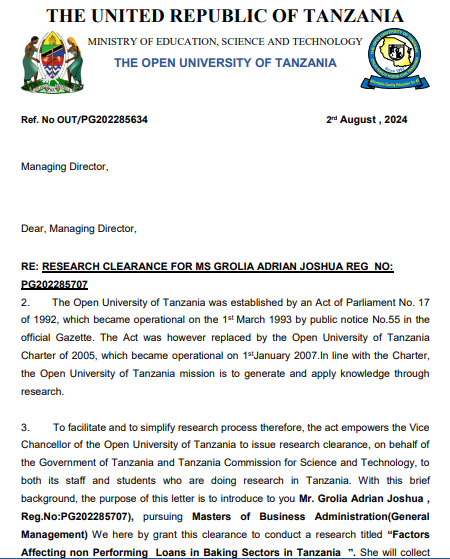
# APPENDICES

# APPENDIX I: DATA COLLECTED

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **BANK** | **YEAR** | **GDP GROWTH RATE** | **INFLATION RATE** | **LIQUIDITY RATE** | **NPL RATIO** | **CAR** |
| **NMB** | 2019 | 5.8% | 3.45% | 2.70 | 7.1% | 15.10% |
|  | 2020 | 2.0% | 3.29% | 2.80 | 5.3% | 16.02% |
|  | 2021 | 4.3% | 3.69% | 3.00 | 4.6% | 15.60% |
|  | 2022 | 4.6% | 4.30% | 3.60 | 3.7% | 16.15% |
|  | 2023 | 5.2% | 4.04% | 3.24 | 3.2% | 17.18% |
|  |  |  |  |  |  |  |
| **CRDB** | 2019 | 5.8% | 3.45% | 2.30 | 5.5% | 13.30% |
|  | 2020 | 2.0% | 3.29% | 1.60 | 4.3% | 14.19% |
|  | 2021 | 4.3% | 3.69% | 2.60 | 3.3% | 14.11% |
|  | 2022 | 4.6% | 4.30% | 3.50 | 2.8% | 14.87% |
|  | 2023 | 5.2% | 4.04% | 3.60 | 2.1% | 15.39% |
|  |  |  |  |  |  |  |
| **NBC** | 2019 | 5.8% | 3.45% | 2.00 | 7.8% | 14.29% |
|  | 2020 | 2.0% | 3.29% | 2.30 | 3.1% | 12.29% |
|  | 2021 | 4.3% | 3.69% | 2.80 | 4.8% | 13.28% |
|  | 2022 | 4.6% | 4.30% | 3.00 | 3.9% | 12.14% |
|  | 2023 | 5.2% | 4.04% | 2.80 | 4.2% | 11.07% |
|  |  |  |  |  |  |  |
| **DTB** | 2019 | 5.8% | 3.45% | 0.06 | 13.3% | 15.11% |
|  | 2020 | 2.0% | 3.29% | 0.07 | 7.1% | 14.57% |
|  | 2021 | 4.3% | 3.69% | 0.08 | 8.2% | 14.87% |
|  | 2022 | 4.6% | 4.30% | 0.06 | 7.1% | 14.35% |
|  | 2023 | 5.2% | 4.04% | 0.05 | 7.6% | 13.85% |
|  |  |  |  |  |  |  |
| **MCB** | 2019 | 5.8% | 3.45% | 0.23 | 7.2% | 15.11% |
|  | 2020 | 2.0% | 3.29% | 0.26 | 6.4% | 14.57% |
|  | 2021 | 4.3% | 3.69% | 0.20 | 5.4% | 14.87% |
|  | 2022 | 4.6% | 4.30% | 0.19 | 6.3% | 14.35% |
|  | 2023 | 5.2% | 4.04% | 0.18 | 6.4% | 13.85% |
|  |  |  |  |  |  |  |
| **STANDARD** | 2019 | 5.8% | 3.45% | 0.16 | 5.6% | 15.11% |
|  | 2020 | 2.0% | 3.29% | 0.16 | 6.9% | 14.57% |
|  | 2021 | 4.3% | 3.69% | 0.20 | 5.4% | 14.87% |
|  | 2022 | 4.6% | 4.30% | 0.06 | 3.5% | 14.35% |
|  | 2023 | 5.2% | 4.04% | 0.07 | 4.1% | 13.85% |
|  |  |  |  |  |  |  |
| **STANBIC** | 2019 | 5.8% | 3.45% | 0.27 | 5.8% | 14.29% |
|  | 2020 | 2.0% | 3.29% | 0.24 | 4.6% | 12.28% |
|  | 2021 | 4.3% | 3.69% | 0.27 | 4.9% | 13.28% |
|  | 2022 | 4.6% | 4.30% | 0.23 | 4.4% | 12.14% |
|  | 2023 | 5.2% | 4.04% | 0.31 | 3.9% | 11.07% |
|  |  |  |  |  |  |  |
| **KCB** | 2019 | 5.8% | 3.45% | 0.06 | 8.4% | 15.10% |
|  | 2020 | 2.0% | 3.29% | 0.20 | 8.6% | 16.02% |
|  | 2021 | 4.3% | 3.69% | 0.20 | 8.7% | 15.60% |
|  | 2022 | 4.6% | 4.30% | 0.24 | 7.5% | 16.51% |
|  | 2023 | 5.2% | 4.04% | 0.28 | 6.7% | 17.18% |
|  |  |  |  |  |  |  |
| **ACB** | 2019 | 5.8% | 3.45% | 0.18 | 8.5% | 14.29% |
|  | 2020 | 2.0% | 3.29% | 0.19 | 7.8% | 12.29% |
|  | 2021 | 4.3% | 3.69% | 0.19 | 7.8% | 13.28% |
|  | 2022 | 4.6% | 4.30% | 0.22 | 7.9% | 12.14% |
|  | 2023 | 5.2% | 4.04% | 0.26 | 7.6% | 11.07% |
|  |  |  |  |  |  |  |
| **EQUITY** | 2019 | 5.8% | 3.45% | 1.32 | 9.4% | 13.30% |
|  | 2020 | 2.0% | 3.29% | 1.32 | 9.6% | 14.19% |
|  | 2021 | 4.3% | 3.69% | 1.16 | 6.4% | 14.11% |
|  | 2022 | 4.6% | 4.30% | 0.51 | 6.0% | 14.87% |
|  | 2023 | 5.2% | 4.04% | 1.68 | 6.8% | 15.39% |
|  |  |  |  |  |  |  |

# APPENDIX 2: CLEARANCE LETTERS

**OUT CLEARANCE LETTER**

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