



ADDIS ABABA UNIVERSITY  
COLLEGE OF BUSINESS AND ECONOMICS  
DEPARTMENT OF ECONOMICS

DETERMINANTS OF NON-PERFORMING LOANS: THE CASE OF  
COMMERCIAL BANKS IN ETHIOPIA

THESIS SUBMITTED TO DEPARTMENT OF ECONOMICS IN PARTIAL  
FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF  
MASTERS OF SCIENCE (MSC) IN FINANCIAL ECONOMICS

BY:

YORDANOS BELETE ESHETE

ADVISOR: DR SISAY REGASSA

JUNE, 2023

ADDIS ABABA, ETHIOPIA

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## DECLARATION

I, the undersigned, affirm that the research titled "Determinants of Non-Performing Loans: The Case of Commercial Banks in Ethiopia" is my original work. I have conducted this research independently, with guidance and assistance from my research advisor. This study has not been submitted for any degree or diploma at this or any other institution.

Name of student: Yordanos Belete Eshete

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Certification

This is to certify that the thesis prepared by Yordanos Belete, “Determinants of non-performing loans in commercial banks in Ethiopia” and submitted in partial fulfillment of the requirements for the degree of Master of Science in Financial Economics complies with the regulations of the university and meets the accepted standards with respect to originality and quality.

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## ACRONYMS

LG: Loan Growth Rate

CAR: Capital Adequacy Ratio

IMF: International Monetary Fund

LTD: Loan to deposit

NBE: National Bank of Ethiopia

NPL: Non-performing Loan

ROA: Returns on Asset

NBE: National bank of Ethiopia

AIB: Awash International Bank

BOA: Bank of Abyssinia

CAR: Capital Adequacy Ratio

DB: Dashen Bank

CBE: Commercial Bank of Ethiopia

NIB: Nib International Bank

UB: United Bank

WB: Wegagen Bank

## ABSTRACT

*This study aims at investigating the determinants of non-performing loans in Ethiopian commercial banks from 2006 to 2021. The study used panel data on fourteen commercial banks obtained from the annual reports of each of the commercial banks and the national bank of Ethiopia. A fixed effect model was employed to analyse the determinants of NPLs. Results from the study indicate that capital adequacy ratio, loan growth, and return on assets have a negative and significant influence on NPLs. This study holds importance in bridging the research gap, as it is vital to understand the causes of NPLs to address the issue effectively. The study recommends that bank managers need to maintain a strong capital adequacy ratio, foster sound management practices to maximize return on assets, and establish comprehensive credit assessment and monitoring systems. These measures will help mitigate the risks associated with non-performing loans and support a stable banking sector, enabling banks to thrive and prosper in increasingly competitive financial markets.*

*Keywords: Non-Performing Loans, commercial banks of Ethiopia, fixed effect.*

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# CHAPTER ONE

## 1. INTRODUCTION

### 1.1. BACKGROUND OF THE STUDY

Financial institutions are organizations that offer a wide range of financial services to individuals, businesses, and governments. They are responsible for managing money, such as deposits, loans, investments, and other financial transactions. These institutions are important to the economy's smooth functioning, as they facilitate the flow of funds, handle risk management, and promote resource allocation efficiency (Richard, 2011). Financial institutions have various roles, including mobilizing savings, providing credit, risk management, financial intermediation, payment and settlement systems, and financial advisory. In essence, they are critical players in the financial system, encompassing banking, insurance, capital markets, and other sectors. Well-performing financial institutions indicate a growing economy in a country, whereas poorly-performing ones obstruct the nation's economic development and organization (Muhammad, Ammara, and Abrar, 2012).

Commercial banks in Ethiopia are one of the financial institutions that are categorized into government-owned (which are owned and managed by the Ethiopian government), private commercial banks (which are privately owned and operated), and government owned development bank (which concentrate on offering financial assistance for projects that promote economic growth and development in the country). This study primarily focuses on both government and private owned commercial banks in Ethiopia.

Frederic *et al*, (2012) emphasized the crucial role of commercial banks as financial intermediaries, which includes safeguarding funds by accepting deposits and providing loans to eligible borrowers. Loans are assets that are crucial component of a bank's operations. This is due to several reasons. The first reason is that loans generate profit, since a large portion of a bank's income comes from the interest charged on loans. Borrowing customers agree to pay interest on the principal amount, creating revenue for the bank. Secondly, loans increase Economic growth, as banks help boost the economy by injecting funds into it through loans. This allows businesses to invest in expansion, research and development, and job creation, ultimately contributing to overall economic prosperity. Third, loans increase competitiveness. In a highly competitive banking

industry, having attractive and flexible loan products can help a bank stand apart from competitors, draw new customers, and maintain existing ones. Fourth, community development is facilitated by banks providing loans for housing, small businesses, and other community requirements, contributing to the growth and development of local communities. Though loans are the most significant assets, accounting for the largest share of operating income, they also represent a bank's greatest exposure to default risk (MacDonald and Koch, 2006).

According to Vatansever and Hepsen (2013), loans produce significant interest income, which is crucial for assessing a bank's financial stability and performance. MacDonald and Koch (2006) state that loans account for 50 to 75 percent of a bank's overall assets and represent the primary source of credit risk and the largest portion of its source of income. Therefore, efficient loan management not only improves the effectiveness of banks but also boosts a nation's overall performance.

Burton, Nesiba, and Brown (2015) describe credit risk as the likelihood that a borrower will be unable to pay back the principal or interest on an outstanding debt, which is one of the many risks banks need to manage. Nikola and Jelan (2017) point out that two commonly used measures for evaluating credit risk are the ratio of non-performing loans to total loans and the proportion of loan loss provisions to total loans. Over the past three to four decades, experts have increasingly focused on non-performing loans (NPLs) as their growth has created issues within the banking sector (Barr and Siems, 1994). Moreover, Muhammed *et al*, (2012) discovered that NPLs are a primary reason for banks failing, which negatively impacts the overall economy.

There isn't a universal definition for NPLs, as what is suitable in one nation might not be applicable in another (Gadise, 2014). As per the International Monetary Fund (2009), NPLs are defined as any loans in which the principal and interest payments have been delayed for over 90 days or when interest amounting to more than 90 days has been refinanced. The Basel Committee (2001) also defined NPLs as loans that are left unpaid for a period of 90 days. Under the Ethiopian Banking Business Directive of the National Bank of Ethiopia, NPLs are defined as loans whose credit quality has deteriorated such that full collection of the principal and/or interest is not accomplished in accordance with the contractual repayment terms of the loan (NBE, 2008). The researcher employs the definition of NPLs provided by the National Bank, as the collected data comes from the National Bank of Ethiopia.

In addition, according to the directives issued by the National Bank of Ethiopia, banks' NPLs should not exceed the 5% minimum threshold set by the NBE. As per directive SBB/69/2018, banks are required to report to the National Bank on a quarterly basis regarding loans or advances that exceed 5% of the banks' total capital and have been restored from non-accrual to accrual status. Although, there are no specific penalties imposed on banks if their NPLs increase, Directive No. SBB/35/2004 states that any bank that fails to comply with the NBE's requirements shall be subject to a penalty of Birr 10,000 (ten thousand Birr) for each violation.

High levels of NPLs within the banking sector are the leading cause of bank failures. Research on the factors contributing to such failures, such as Barr and Siems (1994), Onchomba (2014), Bolt and Tieman (2014), Jovovic (2014), and Saba (2018), consistently demonstrates that asset quality is a key predictor of bankruptcy, with failing banks having elevated NPL levels before collapsing. As the quantity of NPLs grows, the banks' asset quality declines, negatively affecting their efficiency, income (due to increasing provision costs for rising NPLs), reputation, resource mobilization capabilities, stability, and role in financial intermediation. Such a decline has knock-on effects on investment and overall economic growth.

The discussion above highlights the significance of NPLs in influencing bank policies and credit performance. This research seeks to investigate the underlying causes of NPLs in Ethiopian commercial banks, focusing on bank specific factors.

## 1.2 STATEMENT OF THE PROBLEM

Banks have the dual responsibility of maximizing profits and shareholder value while offering financial services. A significant part of a commercial bank's revenue is generated from loans and advances, making lending an essential source of funding for their operations (Radha, 1980). Banks hold a crucial position in any economy since they perform distinctive functions and offer services that, if interrupted, can have adverse consequences for the rest of the economy (Ngwa, 2010). Nevertheless, banks encounter obstacles in fulfilling this responsibility due to the inherent risk associated with lending, which is commonly known as non-performing loans.

Banking crises and NPLs have a close relationship, as NPLs pose a significant risk to bank profitability, liquidity, and credit ratings. High levels of NPLs lead to increased provision expenses, reducing liquidity and causing a mismatch in maturities between assets and liabilities. This

mismatch further contributes to liquidity risk, ultimately lowering the bank's credit rating and damaging its reputation. Therefore, it is crucial for banks to manage and minimize NPLs to maintain their financial stability and reputation in the market. This implies that, the factors contributing to NPLs must be carefully examined due to their potential negative consequences.

In Ethiopia, the 2012 directive from the National Bank of Ethiopia led to a marked improvement in the NPLs of Ethiopian commercial banks, with NPLs averaging as low as 5%.

However, (Mehari, 2012), as cited in (Tsige, 2013), explained the reduction of NPLs in ECBs was not due to better credit risk management, assessment, and supervision systems; instead, it was caused by writing-off and restructuring loans. The issue of coping with NPLs at acceptable levels in ECBs is still in unsolved as banks are exceeding the maximum (5%) limit of NPLs. When we look at several commercial banks' NPL rates over time, we can see that they are greater than 5%. For instance, the commercial bank of Ethiopia had NPLs in 2019 and 2020 that were 14% and 11%, respectively. Lion International Bank's NPLs were 16% in 2021, and Wegagen Bank's NPLs were 11% in both 2016 and 2021. In 2021 and 2022, Berhan Bank had 8.8% and 8%, respectively, of NPLs (NBE annual report, 2016, 2019, 2021, and 2022). Although the overall non-performing loan ratio for Ethiopian banks is within acceptable limits (5%), some banks continue to struggle with NPL issues

Numerous national studies have been carried out to examine the factors that influence non-performing loans in emerging economies like Ethiopia. Research in this area includes works by Wendemagegnehu (2012), Anisa (2015), Sirak (2016), Dagne and Maru (2016), Sitana (2018), Wakgari *et al.* (2019), Berhanu (2019), and Abebe (2021). The motivation for conducting this study lies in the fact that, with the exception of Birhanu (2019) and Abebe (2021), the aforementioned studies utilised data from before 2018 and mainly focused on a small cross-section of banks. This research was carried out in response to the growing trend of NPLs observed among several commercial banks. The aim of the study is to expand the scope by examining a larger number of banks and extending the period of analysis.

Moreover, the results of various studies on the factors affecting NPLs have been different and depended on factors such as economic conditions, credit policies, and the overall banking environment. Commercial banks in Ethiopia possess distinct features that set them apart, such as state bank dominance, the early stage of the industry, restrictions on foreign banks, and a lack of

capital markets. In general, this study aims at addressing questions such as what factors determine NPLs in commercial banks in Ethiopia? And which specific factors from banks impact the level of NPLs, and how significant is their influence?

### 1.3 OBJECTIVES OF THE STUDY

#### 1.3.1 GENERAL OBJECTIVE

The general objective of this study is to examine the determinants NPLs in commercial banks of Ethiopia.

#### 1.3.2. SPECIFIC OBJECTIVES

In accordance with the general objective, the study aims to achieve the following specific objectives.

- To examine the effect of Bank specific determinants (such as Loan growth, net interest margin, return on equity, return on asset, loan to deposit ratio, capital adequacy ratio, bank size, and income diversification) on NPLs of the banking sector.
- To investigate the extent to which bank-specific variables impact NPLs and which variable has the most significant impact on the level of NPL.

### 1.4. HYPOTHESES OF THE STUDY

The study's hypotheses were developed based on existing theories and previous empirical research that has explored the factors influencing banks' NPLs. The researcher has formulated the eight hypotheses in line with the broad objective of the study. This research expects the following relationship:

H1: There is a significant negative relation between capital adequacy ratio and bank's NPLs

H2: There is a significant negative relation between size of bank and bank's NPLs.

H3: There is a significant negative relation between return on asset and bank's NPLs

H4: There is a significant negative relation between return on equity and bank's NPLs.

H5: There is a significant negative relation between income diversification and bank's NPLs

H6: There is a significant positive relation between loan growth and bank's NPLs.

H7: There is a significant positive relation between loan to deposit ratio and bank's NPLs

H8: There is a significant positive relation between net interest margin and bank's NPLs

### 1.5. SIGNIFICANCE OF THE STUDY

If the issue of NPLs is not tackled, it may lead to a financial crisis. Therefore, minimizing NPLs is essential to maintain healthy banking industry that boots economic growth. Identifying the root cause of the problem is the key to addressing it. The findings of this study provide valuable direction for bank managers and regulatory authorities on effectively managing NPLs by identifying the primary factors contributing to NPLs in the banking industry. This study contributes to the literature on determinants of NPLs within the Ethiopian banking system, by incorporating specific bank-related characteristics. Moreover, it serves as a valuable point of reference for future research on the subject.

### 1.6. SCOPE OF THE STUDY

This study focusses on the factors influencing NPLs in Ethiopian commercial banks by analyzing unbalanced panel data from fourteen banks over a period of sixteen years, from 2006 to 2021. The banks considered for the study include the Commercial Bank of Ethiopia (CBE), Awash Bank (AB), Wegagen Bank (WB), United Bank (UB), Nib International Bank (NIB), Cooperative Bank of Oromia (COOP), Lion International Bank (LIB), Abyssinia Bank (BOA), Oromia International Bank (OIB), Bunna International Bank (BIB), Zemen Bank (ZB), Berhan Bank (BB), Addis International Bank (AIB), and Dashen Bank (DB). These banks were selected to enhance the cross-sectional data, include banks with more lending experience, and based on the availability of data. The study utilized secondary data and focused on eight bank specific variables: bank size (BS), loan growth (LG), net interest margin (NIM), loan-to-deposit ratio (LTD), return on asset (ROA), return on equity (ROE), and capital adequacy ratio (CAR) in ECBs.

## 1.7. ORGANIZATION OF THE THESIS

This study is structured into five chapters. The first chapter explores the background of the study, the problem statement, objectives of the research, hypotheses, significance, scope, and organization. In the second chapter, an extensive examination of both theoretical and empirical literature is presented. The research methodology is outlined in the third chapter, which includes information on the research design, sample selection, data gathering methods, and data analysis approaches. The study's findings and their interpretation are discussed in chapter four, while the fifth chapter concludes the findings.

## CHAPTER TWO

### 2. LITRATURE REVIEW

#### 2.1 PREDOMINANT THEORIES OF NON-PERFORMING LOANS

##### 2.1.1. INFORMATION ASYMMETRY THEORY

Information asymmetry refers to a situation in which one party engaged in a transaction, negotiation, or decision-making process has access to more or superior information than the other party in the transaction (Frederic *et al*, 2012). This disparity in knowledge can result in unfair advantages, suboptimal choices, or market inefficiencies, as the party with limited information may struggle to properly evaluate risks or potential outcomes. In various economic and social settings, it is crucial to reduce information asymmetries to promote fair and efficient outcomes.

Auronen (2003) emphasized that in a market, the party possessing better information can secure more favorable terms in a transaction. Consequently, the party with lesser information might find themselves in a position where they could make decisions related to the transaction that are either accurate or incorrect. The presence of information asymmetry can cause NPLs for several reasons. First, when information asymmetry occurs, lenders may struggle to accurately determine borrowers' risk profiles, which could lead to loans being granted to high-risk individuals. This can heighten the possibility of NPLs, as these borrowers are more likely to default on repayments compared to those with lower risk levels.

Second, information asymmetry can impede lenders' ability to effectively price loans, affecting the total portfolio risk. In the absence of accurate risk assessments, lenders may impose higher interest rates to account for potential defaults. This can result in increased NPLs as borrowers struggle to pay back high-interest loans.

Third, Information asymmetry can also lead to a decrease in lending within the market, as lenders become more cautious due to the heightened risk of NPLs. This can initiate a vicious cycle where reduced lending causes a decline in economic activity, which can further increase NPLs.

Asymmetric information leads to two main issues: adverse selection, which takes place before a transaction, and moral hazard, which happens after a transaction.

## I. ADVERSE SELECTION

Adverse selection involves high-risk borrowers being more likely to apply for loans, Frederic *et al*, (2012). This problem may arise when banks and other financial institutions struggle to accurately identify and assess loan applicants, as the applicants could conceal their real risk level due to an imbalance in information. A study conducted by Ye, Wang and Yang (2022) revealed that financially distressed firms, those with defaulted loans, are more likely to conceal negative information. This behavior leads to increased information asymmetry between lenders and borrowers. Consequently, banks might end up giving loans to borrowers who are more likely to default, increasing their credit risk and leading to a higher number of NPLs. To minimize the problem of adverse selection, measures such as private information production and sales, government regulations to enhance information, collateral, and net worth can be effective. Banks and regulators can also reduce adverse selection and NPL risk by implementing tighter credit risk assessment policies and monitoring. By refining the procedure for screening and evaluating loan applicants, banks can lower their chances of lending to riskier borrowers, thus minimizing the occurrence of non-performing loans.

## II. MORAL HAZARD

Moral hazard arises when the incentives of both parties involved in a contract change after the agreement has been signed (Chengeta, 2007). This usually happens after a transaction occurs, where the lender bears the risk of the borrower participating in activities that may not be favorable from the lender's perspective, as such actions could reduce the likelihood of loan repayment. Once borrowers obtain a loan, they might engage in high-risk activities because they believe that they will not bear the full consequences of those activities, which can offer significant returns but also have a higher risk of default. To minimize the moral hazard issue in debt contracts, various strategies can be employed, such as requiring collateral and increasing net worth, improving risk management, enhancing monitoring, implementing restrictive covenants, and involving financial intermediaries.

### III. PRINCIPAL-AGENT PROBLEM

A principal-agent problem arises when the interests of the principal and agent diverge, causing the agent to prioritize their own interests above those of the principal. In this relationship, the principal is the party that officially assigns the agent to make choices and take actions on their behalf (CFI, 2020). According to Jensen and Meckling (1976), a contractual agreement called an agency relationship exists when one or more individuals (known as the principal) employ another individual (known as the agent) to perform a specific service on their behalf, granting the agent some authority in decision-making. The agency problem frequently occurs when managers are supposed to prioritize shareholders' interests and make choices that boost shareholder wealth, but instead, they focus on their own interests. This issue emerges due to management highly valuing self-interest and short-term financial benefits. The agency problem pertains to situations where managers grant high-risk loans or engage in risky investments to achieve greater returns, consequently raising the likelihood of NPLs. This problem becomes particularly significant when managers are rewarded based on their performance, potentially encouraging them to undertake higher risks for personal gain. One cause of the agency problem is inadequate oversight and control mechanisms within the bank. Without proper monitoring and accountability, managers might not be held responsible for their decisions, leading to poor lending choices that result in increased NPLs. Managers may prioritize short-term profits over long-term stability and growth. This may result in managers aggressively growing their loan portfolios to raise revenue and profits, without considering the long-term risks associated with those loans. Over time, this short-term focus can lead to more loans defaulting, thus increasing NPLs. In general, the agency problem can contribute to the rise of NPLs. To address this issue, it is crucial to improve governance, strengthen oversight, align incentives, and promote financial stability. These measures can help mitigate the risks of NPLs and support the overall health of the financial system.

## 2.2 EMPIRICAL EVIDENCES

This section provides a comprehensive overview of the major factors influencing NPLs. As a result, the first subsection discusses the key determinants of NPLs across various countries. The second subsection reviews previous studies examining factors contributing to NPLs in Africa, while the final subsection presents empirical evidence from Ethiopia.

### 2.2.1. CROSS-COUNTRY STUDIES

Research by Nkusu (2011), Skarica (2013), and Makri *et al.* (2014) has demonstrated a significant relationship between macroeconomic variables and NPLs. Nkusu's study (2011) analyzed data from 1998 to 2009 for 26 advanced economies, focusing exclusively on macroeconomic factors such as GDP growth, unemployment, house price index changes, equity price index changes, inflation, nominal effective exchange rate, policy interest rate, and credit to the private sector. The research suggests that a worsening macroeconomic environment, characterized by slow growth, increased unemployment, or declining asset prices, is linked to higher non-performing loans, as seen during the lead-up to the 2008 crisis. However, Nkusu's study is limited by its exclusive focus on macroeconomic variables and its analysis of only 26 advanced economies. The study could benefit from incorporating microeconomic or bank-specific variables, as well as expanding its scope to include a more diverse range of countries, such as emerging markets and developing economies. Despite these limitations, the research remains useful for understanding this relationship in the given context, and further studies can be conducted to address these limitations and enhance understanding in various contexts and across different countries.

Skarica (2013) conducted research on the factors affecting NPLs in Central and Eastern European countries, using a Fixed Effect Model from 2007-2012. The study found that the main cause of higher NPLs is the slowing down of the economy. The research examined loan growth, market interest rate, real GDP growth rate, unemployment, and inflation rate as determinants of NPLs. The results indicated that there is a significant negative relationship between the GDP growth rate and NPLs and a significant positive relationship between the unemployment rate and NPLs. This suggests that recessions lead to increased NPLs while economic growth and expansion result in lower NPLs. The findings also showed that inflation has a positive impact on NPLs, as it can affect borrowers' ability to repay their debts. While Skarica's study offers valuable insights into the crucial factors influencing NPLs in Central and Eastern European countries, the research's limited

time frame and focus on macroeconomic variables imply that additional studies may be needed to gain a more comprehensive understanding of the factors driving NPLs in the region.

Selma and Jouini (2013), Makri *et al.* (2014), and Ming-Chang *et al.* (2016) use both macroeconomic variables and bank-specific variables to identify the determinants of NPLs. Selma and Jouini (2013) conducted a study to investigate the micro and macro factors that affect non-performing loans among 85 banks in Italy, Greece, and Spain between 2004 and 2008. Utilizing a fixed effect approach, they considered both macroeconomic variables (GDP growth rate, unemployment rate, and real interest rate) and bank-specific variables (return on assets, changes in loans, and return on equity). Their findings showed a negative relationship between non-performing loans and GDP growth rate as well as return on assets, while there was a positive relationship between non-performing loans and unemployment rate, loan loss reserves to total loans, and the real interest rate. Though the research contributed to understanding the factors influencing non-performing loans in these countries, the selected timeframe was relatively short.

A study by Makri *et al.*, (2014) investigates the factors that impact the non-performing loan in the Eurozone banking sector between 2000 and 2008. Their research demonstrates a strong relationship between NPLs and multiple macroeconomic factors (such as public debt, unemployment, and the annual percentage growth rate of GDP) as well as bank-specific elements (including capital adequacy ratio, the previous year's NPL rate, and return on equity). The strength of the study was that it was conducted during the significant financial crisis that hit the European region in 2008, leading to an increased focus on NPLs, as high NPL rates were considered a primary reason for the financial contagion. Moreover, the study focused on macroeconomic and bank-specific factors. This approach allowed them to consider a comprehensive view of factors contributing to the rate NPL, thereby providing a more accurate and reliable analysis.

Ming-Chang *et al.*, (2016) research investigates the impact of government policies on the non-performing loan ratio for domestic banks in Taiwan during a period from 1994 to 2008. Factors such as loan to deposit ratio, debt ratio, bank size (Asset), earnings per share, capital adequacy ratio, and directors and supervisors shareholding ratio are considered as the main causes for the appearance of non-performing loans. The study offers significant insights into the factors that affect the NPL ratio in Taiwan's banking sector. However, the study has certain limitations: It only examines a 15-year period, which may not be enough to fully comprehend the influence of

government policies on NPL ratios. A more extended timeframe, covering multiple economic cycles, could provide a deeper understanding of how policy measures affect the non-performing loan ratio.

### 2.2.2. EMPIRICAL STUDIES IN AFRICA

Gaitho (2010) investigated the causes of non-performing loans in Kenyan banks and found that numerous bank-specific factors played a role in contributing to bad loans. These include lax procedures for credit risk assessment, a lack of trained lending personnel, bank negligence in monitoring performing loans, insider lending, and owner concentration. On the customer-specific side, factors such as clients starting new, unfamiliar businesses, operating too many types of businesses simultaneously, improper use of the loan, false or incomplete information in loan applications, poorly valued collateral, or difficulties in recovery were also found to contribute to high NPLs level. The strengths of these studies include using primary data that allowed for uncovering valuable insights not found in secondary data, examining both bank-specific and borrower-specific factors, highlighting the issue of insider lending and owner concentration, and emphasizing the impact of information asymmetry. Overall, these findings emphasize the importance of carefully assessing loan applications and monitoring performance throughout the loan process to mitigate the risk of non-performing loans in Kenya.

The research carried out by Monicah (2011), which explored the factors leading to non-performing loans in Kenyan commercial banks between 2008 and 2012, it was found that there was a positive correlation between non-performing loans and inflation. Furthermore, the study established that there was a reverse relationship between real interest rates, loan growth rates, and non-performing loans in Kenya. However, the study could have been more comprehensive if it considered a broader range of factors that might potentially affect non-performing loans in Kenyan commercial banks. While the research primarily focused on macroeconomic aspects such as inflation, real interest rates, and loan growth rates, it is possible that other relevant factors may also play a role in the occurrence of non-performing loans.

Akinlo and Emmanuel (2014) assessed the factors affecting bad-debts in Nigeria between 1981 and 2011. They developed a macroeconomic model for these loans and found that over a long period, economic growth negatively correlates with non-performing loans. On the other hand, factors such as private sector credit, unemployment and exchange rates have a positive impact on

non-performing loans. The researchers contend that a positive relationship between exchange rates and non-performing loans indicates that when the exchange rate strengthens, it negatively impacts the export-oriented sector of the economy, thereby worsening the banking crisis. Additionally, the positive correlation between credit to the private sector and NPL levels implies that when credit increases, it raises the total amount of money in the economy, which can potentially lead to a decline in the quality of bank portfolios. Credit to the private sector, exchange rate, lending rate and the stock market index are found the main determinant in the short term. This implies that short-term variations in these factors can significantly affect the NPLs' prevalence. Therefore, financial institutions and policymakers in Nigeria should closely track these variables to maintain financial system stability. The study by Akinlo and Emmanuel (2014) offers valuable insights for policymakers and financial institutions in Nigeria, contributing substantially to understanding the factors affecting NPLs and laying a solid groundwork for future research on this subject.

Thabiso (2022) and Ebenezer and Alice (2022) utilized bank-specific and macro variables to assess bad loans. Thabiso (2022) explored factors that influence NPLs in commercial banks across selected West African nations from 2008 to 2019. The study examined 47 commercial banks listed in six countries, utilizing fixed and random effect models for the analysis. The results demonstrated that the liquidity ratio, capital adequacy ratio, and inflation rate significantly affect non-performing loans. Panel data approach and the relatively large sample size of 47 commercial banks contribute to the study's value in identifying potential variations across different countries and banks. However, the author could have considered employing alternative econometric methods, such as dynamic panel model to address potential endogeneity issues and capture possible dynamic relationships between the variables rather than relying solely on fixed and random effect models.

Ebenezer and Alice (2022) conducted a study to analyze the factors influencing non-performing loans in Ghana's banking sector, focusing on both bank-specific and macroeconomic indicators. The research utilized monthly data from January 2007 to December 2019 and applied the ARDL bounds test of co-integration to determine the presence of short-term and long-term relationships among the variables. The study's findings showed that the bank-specific elements impacting non-performing loans are the lending rate, profitability, cost to income ratio, capital adequacy ratio, and net interest margin. At the macroeconomic level, inflation and economic growth reduces non-performing loans. Furthermore, previous year's non-performing loans and net interest margin

depresses Current NPLs whereas credit adequacy ratio promotes Current NPLs in the short-run.

### 2.2.3. EMPIRICAL STUDIES IN ETHIOPIA

Anisa (2015) and Sitana (2018) conducted studies examining the variables affecting non-performing loans in commercial banks in Ethiopia. Anisa's research, spanning from 2004 to 2013, analyzed seven factors, comprising four bank-specific elements and three macroeconomic aspects. The findings from the fixed effect panel regression analysis revealed that deposit rates, loan-to-deposit ratios, and lending interest rates had a positive influence on nonperforming loans, while cost efficiency (the proportion of bank expenses to its income) demonstrated a negative impact. Sitana's (2018) study analyzed nine commercial banks from 2007-2016 using a random effect model. The findings demonstrated that trade liberalization had a positive and significant effect on nonperforming loans, while exchange rates, unemployment, and loan growth had negative effects. Real lending rates, capital adequacy ratios, and ownership structures showed insignificant relationships with nonperforming loans in Ethiopian commercial banks. Sitana, discusses the relationship between unemployment, exchange rate, and loan growth with NPL as follows” Rising unemployment adversely affects people's earnings and exacerbates their debt load, while also reducing the demand for goods and services, resulting in lower revenue for businesses and unstable debt situations”(Sitana, 2018.p.22). Conversely, a decrease in the exchange rate can enhance the ability of exporters to service their debts. Centralized loan application evaluation systems and the establishment of close relationships between banks and borrowers through customer relations managers play a key role in reducing the risk associated with lending and improving decision-making in times of distress.

Both Sitana (2018) and Anisa (2015) studies cover short time periods, which might not be adequate to account for long-term trends and potential structural changes in the banking sector. Additionally, both researchers used macroeconomic and bank- specific variables in their studies, so it might be advantageous to broaden their research scope to encompass other nations, as macro variables have a similar impact on Ethiopian commercial banks. Furthermore, Sitana's study concluded some unexpected patterns that may not align with existing literature, such as the negative relationship between unemployment and loan growth with NPLs. This finding is not in line with what would typically be expected based on economic theory. A more comprehensive

analysis or in-depth discussion of these seemingly incongruent empirical results might help readers comprehend the reasons and implications behind these surprising observations.

Sirak's (2016) study investigates the elements that influence the Non-Performing Loans in the Commercial Bank of Ethiopia between the years 2002 and 2015. A mixed research approach and explanatory design were employed, and a multiple linear regression equation was utilized to estimate the model. According to the regression output results, the loan-to-deposit ratio, financial performance as evaluated by return on equity, and capital sufficiency were shown to be statistically significant determinants affecting NPLs among the analyzed variables. The interview outcomes suggest that factors such as ineffective credit risk evaluation, reliance on collateral-based lending, insufficient loan tracking and follow-up, unvaried loan offerings, brief loan duration, and lack of credit counseling practices also play a role in influencing the NPLs of the Commercial Bank of Ethiopia. A study suggests concentrating on these NPL indicators could help lower the likelihood of default when providing credit in the future. While the research effectively offers insights into the determinants of NPLs in Ethiopia, there are some areas that warrant further scrutiny. The researcher used time series data from 2002-2015, which only covers thirteen years, a relatively short period. Additionally, the researcher gathered some of the primary data through interviews conducted only in the Addis Ababa area. However, since the study focuses on the Commercial Bank of Ethiopia, the interviews should have extended beyond Addis Ababa.

Dagne and Maru's (2016) study aimed at examining the macroeconomic factors, internal bank-specific elements, and external variables affecting Nonperforming debts in the Development Bank of Ethiopia. An examination utilized time series information from 1980 to 2016, consisting of NPLs and eight macroeconomic variables. Additionally, cross-sectional data were collected for bank-specific variables and borrower-related external factors. The study showed a considerable negative relationship between real interest rates, the Development Bank of Ethiopia's credit growth, and exports in connection to the size of non-performing loans over an extended period. Conversely, factors like growth of gross domestic product, Overseas Investment, and average exchange rate demonstrated a substantial positive correlation with non-performing loans. This discovery disputes the anticipated outcome that an increase in GDP growth rate would result in a decline in non-performing debts, and it also challenges previous research findings. Besides macroeconomic factors, the study identified bank-specific factors and borrower-related external

variables that significantly contribute to the occurrence of NPLs in the Development Bank of Ethiopia. Some determinants which contribute to non-performing loans include insufficient evaluation of loan applicants, funding projects that lack creditworthiness, lending for used equipment, failure to address early warning signs of default, borrowers' poor financial documentation, external challenges faced by borrowers, lack of a skilled workforce in project locations, an oversupply of product demand, distance from potential markets, and unfavorable farming conditions.

In a study by Wondimagegnehu (2012), the factors influencing non-performing loans in 11 commercial banks from 2005 to 2010 were examined. The findings revealed that numerous factors, such as insufficient credit evaluation, poor loan supervision, an underdeveloped credit culture, relaxed credit conditions, assertive lending practices, compromised ethics, limited institutional capability, unfair competition among banks, and a lack of knowledge, misallocation of funds for unforeseen purposes, and delayed financing, all had significant impacts on NPLs. In contrast to some prior research, the study discovered that, interest rates - deemed a bank-specific factor - did not have an effect on the level of NPLs in Ethiopian commercial banks. This finding contradicts previous researches suggesting that interest rate levels can influence NPLs by affecting borrowers' ability to repay and banks' lending behavior.

Wakgari *et al*, (2019) examined the elements influencing default risk in selected commercial banks in Ethiopia between 2010 and 2017, focusing on bank-specific variables. Their findings revealed that factors such as efficiency ratio (measure the efficiency of a firm calculated by dividing current liability and current asset by total asset), return on equity, and bank size had significant positive impacts on credit risk. Furthermore, the study demonstrated that capital adequacy had a substantial negative influence on predicting credit risk. However, variables including return on assets, leverage, and deposit ratio did not show any statistically significant effects on credit risk.

Although Wakgari *et al*, (2019) study provides useful insights into the determinants that impact default risk in Ethiopian commercial banks, there are various constraints that must be tackled to gain a more in-depth comprehension of the topic. Firstly, the research's timeframe, which spans from 2010-2017, may not be sufficient to capture the dynamic changes and long-term trends in Ethiopia's banking sector. Given the rapid evolution of financial systems and economic environments, it is crucial to use recent data and conduct long-term studies to determine more

reliable and up-to-date relationships between variables. Secondly, the study indicates that variables such as return on assets, leverage, and deposit ratio do not have a statistically significant impact on credit risk. These results challenge some earlier studies, indicating that a more comprehensive analysis and sophisticated techniques, such as examining multicollinearity and non-linear associations, may be required to gain a deeper insight into how these factors influence credit risk.

### 2.3. SUMMARY AND KNOWLEDGE GAP

Numerous research works have pinpointed several aspects that impact the levels of non-performing loans. These can be broadly grouped in to: macroeconomic elements, factors specific to banks, and those related to borrowers. Macroeconomic factors that have a significant impact on NPL levels include economic growth, inflation, unemployment, and interest rates. Alternatively, factors specific to banks include the size of the bank, capitalization, the quality of assets, and the efficiency of management. Lower NPL levels have been linked to stronger capitalization, better asset quality, higher profitability, and more efficient management. Finally, borrower-specific factors consist of the borrower's creditworthiness, indebtedness, and collateral quality. Improved creditworthiness, reduced indebtedness, and higher collateral quality have been associated with lower NPL levels. To conclusively determine the factors that affect NPL levels, further empirical research should be conducted using various models and techniques, as well as data from different countries and regions. This will allow researchers to make more dependable inferences, and decision-makers to create and execute efficient approaches for reducing NPL levels within the banking sector. Consequently, this contributes to the stability of the banking system and the overall economy.

Based on the theoretical and empirical analyses discussed earlier, it can be inferred that non-performing loans substantially affect the functioning of banks. In this research, the investigator concentrated bank specific factor that influence non-performing loans in Ethiopian commercial banks. In this thesis, the primary focus was on variables such as bank size, loan-to-deposit ratio, return on assets, net interest margin, income diversification, loan growth, return on equity, and capital adequacy ratio. The selection of this variable accordance to the previous literature.

There have been numerous studies that investigated the determinants of non-performing loans. Studies by Sirak Aynalem (2016), Sitina Amino (2018), Wakgari et.ale (2019), Birhanu belay (2019), Dereje Abebe (2021), uses smaller sample size (10 banks and less) and small cross-section

data (ranges from 8 to 10 years except Sirak Aynalem (2016) who incorporates 14 years of data). However, the researcher believes there is a lack of studies that encompass recent years and a large cross-section of data with larger sample size (14 banks). Larger sample size are more closely approximate the population. Hence, conclusion is derived from a sample and applied to a larger population. Furthermore, the value of the standard error is directly depended on the sample size. At last, research on the Ethiopian banking industry is particularly limited, and one of the main objectives of this study is to address this gap in the literature. The researcher has chosen to concentrate solely on bank-specific variables due to the utilization of panel data and the fact that macroeconomic variables would likely affect all banks similarly. Moreover, this study expands its scope by analyzing data from 14 commercial banks over a 16-year period, which allows for greater representation and more accurate findings. Previous research has demonstrated varying relationships between factors, and this study aims to tackle this inconsistency and contribute to a clearer understanding of the determinants of NPLs within the Ethiopian banking sector.

#### 2.4. CONCEPTUAL FRAMEWORK

Based on the study's objective, the following conceptual model has been developed. As discussed in the literature review section, NPLs are influenced by bank-specific factors. These factors consist of bank size, loan-to-deposit ratios, return on assets, net interest margin, loan growth, and capital adequacy ratios. This section emphasizes the connection between dependent and independent variables through the following visual representation.

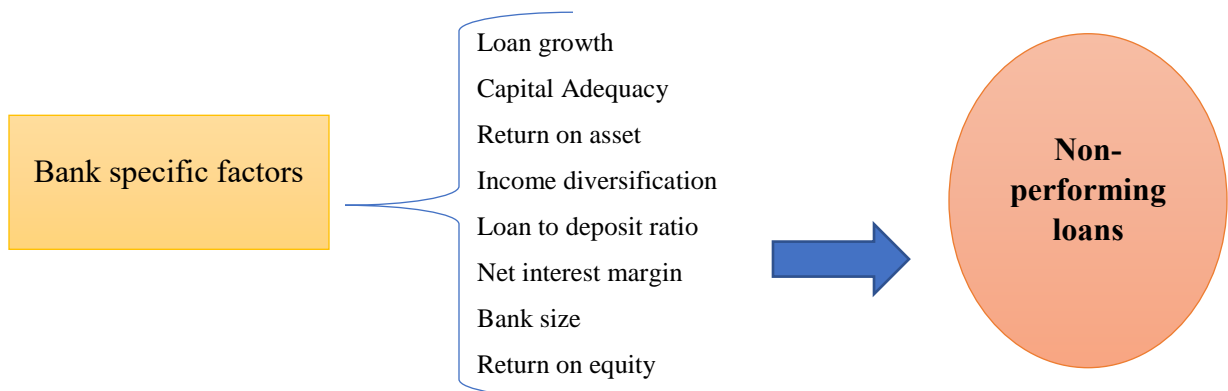


Fig. 1 Conceptual Framework of the Study

Source: developed by the researcher

## CHAPTER THREE

### 3. RESEARCH DESIGN AND METHODOLOGY

The aim of the study is to investigate the influence of bank-specific factors on NPLs, as mentioned in the literature review. A conceptual model has been created to analyze this relationship. The bank-specific factors encompass, bank size, loan-to-deposit ratios, return on assets, net interest margin, loan growth, return on equity, income diversification and capital adequacy ratios. This section, therefore, presents a visual representation of the connection between the dependent and independent variables.

#### 3.1. RESEARCH APPROACH

Three methods that are commonly applied to undertake empirical research are quantitative, qualitative and combination of both quantitative and qualitative approaches (Creswell, 2014). The quantitative approach involves generating data in a numerical form that can be subjected to a thorough and structured quantitative analysis. This method is used for phenomena that can be quantified or represented numerically (Kothari, 2009). Quantitative research method is research approach that utilizes structured question where the response options are predictable and a typically involves a substantial number of participants. On the other hand, qualitative research method refers to information gathered using descriptive, non-numerical approaches that mainly focus on exploratory research and subjective interpretations (Creswell, 2014). Such research method is typically obtained through methods like interviews, observations, focus groups, or open-ended survey questions. It deals with aspects like opinions, emotions, personal experiences, and thoughts. In contrast to quantitative data, qualitative data cannot be easily quantified or depicted numerically and necessitates analysis through techniques such as thematic, narrative, or pattern identification to yield valuable insights. The primary aspect to take into account when selecting a research methodology is the specific research issue being addressed. Consequently, the quantitative method is most appropriate when the aim is to identify the factors that affect the outcome and evaluate the effectiveness of interventions or determine the best predictors for particular results. According to Creswell (2014) quantitative method is also ideal for testing theories or explanations, hence, the researcher uses the quantitative research method to examine the factors contributing to NPLs.

### 3.2. RESEARCH DESIGN

A research design serves as a comprehensive framework that outlines the methods and procedures necessary for gathering and analyzing the data needed for a study. The choice of a research design depends on the objectives that researchers seek to achieve (John, 2007). Kothari (2004) states that explanatory research design investigates the causal connections between dependent and independent variables. Therefore, this study aimed to examine the causal relationships between NPLs and bank-specific factors, including income diversification, capital adequacy ratio, bank size, net interest margin, loan growth, return on equity, return on assets, and loan deposit ratio. To achieve this, the researcher employed an explanatory research design.

### 3.3. THE POPULATION OF THE STUDY

The study's population includes all banks that are presently offering financial services and are registered with the National Bank of Ethiopia. Out of the 31 total banks, 29 are private and two are public. This study aims at examining a sample population of 14 commercial banks.

Table 3.1. Total population.

	<b>Bank Name</b>	<b>Year Est.</b>
1	Development Bank of Ethiopia	1901
2	Commercial Bank of Ethiopia	1963
3	Awash International Bank	1994
4	Dashen Bank	1995
5	Bank of Abyssinia	1996
6	Wegagen Bank	1997
7	Hibret Bank	1998
8	Nib International Bank	1999
9	Cooperative Bank of Oromia	2005
10	Lion International Bank	2006
11	Oromia International Bank	2008
12	Bunna Bank	2009
13	Zemen Bank	2009

14	Abay Bank S.C	2010
15	Berhan Bank	2010
16	Addis international bank S.c	2011
17	Debub Global Bank	2012
18	Enat Bank	2013
19	ZamZam Bank	2021
20	Hijra Bank	2021
21	Siinqee Bank	2021
22	Shabelle Bank	2021
23	Goh Betoeh Bank SC	2021
24	Tsehay Bank	2022
25	Amhara Bank	2022
26	Ahadu bank	2022
27	Tsedey Bank	2022
28	Omo bank	2022
29	Geda bank	2022
30	Rammis bank	2022
31	Sidama bank	2022

Source: [www.nbe.et](http://www.nbe.et)

Table 3.2: Sample population of the study

	<b>Bank Name</b>	<b>Year Est.</b>
1	Commercial Bank of Ethiopia	1963
2	Awash International Bank	1994
3	Dashen Bank	1995
4	Bank of Abyssinia	1996
5	Wegagen Bank	1997
6	Hibret Bank	1998
7	Nib International Bank	1999

8	Cooperative Bank of Oromia	2005
9	Lion International Bank	2006
10	Oromia International Bank	2008
11	Bunna International Bank	2009
12	Zemen Bank S.C	2009
13	Berhan bank S.C	2009
14	Addis international bank	2011

### 3.4. SAMPLING TECHNIQUE AND SAMPLE SIZE

Fourteen senior commercial banks were chosen using a non-probability sampling method, considering their operations from 2006 to 2021. The researcher opted for this timeframe to collect up-to-date data that could adequately address the research objective, given the apparent shortage of studies analyzing NPLs using recent data. The selection of these fourteen banks from the total population, in accordance with the employed sampling approach, relied on criteria such as their establishment date and data availability. Only banks with more than a decade of experience in banking operations were included.

### 3.5. DATA SOURCE AND TYPE

The researcher employs panel data to examine the relation between non-performing loans and bank-specific variables. As highlighted by Kothari (2009), panel data is a valuable source of information as it combines both cross-sectional and time-series data, capturing individual variability as well as the dynamic nature of the data. This type of data also increase degrees of freedom, higher efficiency, and reduced collinearity among variables. In this study, the researcher uses unbalanced panel data – encompassing banks with varying numbers of observations. To gather data for this research, the investigator sources financial information from the past sixteen years (2006–2021), specifically focusing on the balance sheets and income statements of each bank. The NPLs and bank-specific variable data are obtained from the annual reports of the National Bank of Ethiopia and the respective commercial banks.

### 3.6. DATA ANALYSIS

Analysis refers to the calculation of specific metrics while also exploring the relationships and patterns that exist within different data sets (Kothari, 2009). The researcher analyzed data using statistical methods like regression and descriptive statistics. The minimum, maximum, mean, and standard deviation are all determined through descriptive statistics. The study examined the impact of various explanatory factors on the dependent variable (NPLs of commercial banks in Ethiopia) using a fixed effect model. Additionally, diagnostic tests were conducted such as multicollinearity, normality, and stationarity test.

### 3.7. BANK SPECIFIC FACTORS

Variables that defined particular banks were bank-specific; these factors are subject to managerial decisions and are typically connected to the particular policy choices made by a particular bank in an effort to boost efficiency and improve risk management (Berhanu, 2019). As a result, factors unique to banks are taken into account, including loan growth, financial performance, bank size, solvency, loan portfolio quality, and operational efficiency. These elements are frequently proposed as NPL predictors. As a result, the bank-specific variables that were employed in this research are presented in precise detail in the section that follows.

#### 3.7.1. CAPITAL ADEQUACY RATIO

Capital adequacy ratios represent the proportion of a bank's capital relative to its risk-weighted asset (Casu, 2015). The capital adequacy ratio measures a bank's degree of solvency, stability, soundness, and risk-taking capacity (Wood and Skinner, 2018). An increased capital adequacy ratio offers better protection for depositors, playing a crucial role in ensuring the stability of the banking system. This is essential in preventing panic, bank runs, and uncertainty (Keovongvichit, 2012). All authorized Ethiopian banks must maintain a capital to risk-weighted asset ratio of 8% at all times, according to NBE Directive 2021.

There is no clear agreement on the relation between capital adequacy and NPLs based on empirical studies. Some research, including studies conducted by Makri *et al*, (2014) and Dhar and Bakshi (2015) has identified a negative relation between the capital adequacy ratio and NPLs. This suggests that as CAR increases, providing a greater capacity to absorb a high-risk loan portfolio, the level of NPLs will be lower. In contrast, Saba *et al*, (2012) and Curak *et al*, (2013) argued that

banks with high CAR levels may be motivated to engage in riskier activities, leading to more hazardous credit portfolios. This study expects a negative association with NPLs.

### 3.7.2. BANK SIZE

Bank size refers to the total assets of a bank. The most common measure of a bank's size is its total assets, as this reflects the firm's resources and financial capacity (Yusuf, 2019). Researchers often use the natural logarithm of a bank's total assets to gauge its size, following a method similar to Vitthessonthi (2016). Large banks typically collaborate with major corporations, possessing extensive experience, strong management capabilities, and diversification. This enables big banks to often lower their credit default rates. However, there is also a risk that large banks might adopt a more lenient credit policy under the assumption of being "TOO BIG TO FAIL," which could lead to lax credit monitoring activities. Effective risk management techniques are therefore crucial, as the relationship between bank size and risk is heavily influenced by the bank management's approach to risk (Million *et al*, 2019).

Research on the relationship between bank size and NPLs has strongly indicated that a negative correlation exists between these two factors (Salas and Saurina, 2002; Hu *et al.*, 2006). This negative relationship suggests that larger banks are more effective in managing risks and implementing advanced technologies, permitting more efficient gathering, processing, and analysis of information, which ultimately results in lower levels of NPLs when compared to their smaller counterparts. Consequently, this study anticipates a negative correlation between the size of a bank and its NPLs.

### 3.7.3. NET INTEREST MARGIN (NIM)

Net interest margins refer to the disparity between the interest earned through lending and the interest paid out, it measures bank performance and efficiency (Casu *et al*, 2015). A high NIM indicates that a bank is making more money from its lending activities compared to the interest payments it's obligated to pay, resulting in higher profitability. On the other hand, a low NIM indicates that a bank's lending activities are not generating sufficient returns relative to its interest expenses, which negatively impacts the institution's profitability. When a bank experiences a consistent decline in its NIM, it may signify difficulties in earning sufficient income from its loan portfolio. This situation might result in a higher number of borrowers defaulting on their loan repayments, thereby causing an increase in NPLs. Moreover, a steadily decreasing NIM could be

an indication that the bank isn't effectively managing its loan portfolio risk or is extending loans to high-risk borrowers, potentially leading to a rise in NPLs over time. Research conducted by Lis *et al*, (2000), Ozil (2015) and Nikola and Jelena (2017), has identified a positive and substantial relation between net interest margin and non-performing loans. This study anticipates a positive relation with NPLs.

#### 3.7.4. RETURN ON ASSET (ROA) AND RETURN ON EQUITY (ROE)

Two commonly used ratios to evaluate banking performance and assess the quality of bank management are Return on Equity (ROE) and Return on Assets (ROA). These ratios ensure that the continuity of benefits and the extent of risks are considered when analyzing profitability in terms of cash flow. Poor risk management can lead to an increase in the allowance for bad debts, which may result from an inadequate assessment of loan projects or insufficient control over borrower collateral. These ratios measure a bank's profitability, with profits being linked to equity and all other remaining assets (Syrin *et al*, 2020).

ROE is a performance indicator that assesses a company's ability to generate profits from its investors' funds. It is presented as a percentage and computed by dividing the net income by the shareholders' equity. ROE is an indicator of a company's effectiveness in utilizing its shareholders' investments to generate profits, enabling investors to compare the financial performance of different companies. A higher ROE suggests that a company is more efficient in generating profits. ROA refers to the proportion of income to total assets and serves as an indicator of a bank's profitability. This metric demonstrates the effectiveness of an organization's management in producing net income from all its owned resources (Syrin *et al*, 2020). ROA is a representation of efficiency in using assets and reveals the amount of net income generated from these assets. It highlights the bank management's proficiency in creating profits by making the most of the bank's available assets.

Different studies have yielded contrasting findings on the relationship between Return on Assets and NPLs. Ahmed and Bashir (2013) along with Makri *et al*, (2014) identified a positive and significant correlation between ROA and NPLs. On the other hand, Boudriga *et al* (2009) and Selma and Jouini (2013) found a negative link between the two variables, suggesting that a decrease in the profitability ratio, as represented by ROA, contributes to banks taking more risks, which in turn results in a higher level of NPLs. They contend that since ROA is an indicator of

asset utilization efficiency, inefficient use of assets leads to a higher level of NPLs for banks. Consequently, a negative association between ROA and NPLs is expected in this study.

### 3.7.5. LOAN GROWTH

Loan growth refers to the average increase in a bank's total loans, excluding the provision for loan losses, as recorded on the balance sheet after four fiscal quarters in a year. High loan growth by commercial banks is often seen as a major contributor to the increase in NPLs. Rapid loan growth can occur when banks lower interest rates for borrowers or offer loans to those with poor credit ratings. As a result, there may be a rise in problematic loans due to adverse selection. The rate of credit growth is a possible factor that could lead to a higher number of NPLs. Studies, such as those conducted by Williams (2016), Fendi *et al*, (2017), and Ozili (2019), emphasize that an increase in loans can adversely impact profitability due to the higher likelihood of default payments. Keeton (1999) posits that an increase in credit growth leads to a higher NPL ratio, as banks may lower their lending rates and credit screenings in order to entice borrowers. Likewise, Ahmad and Bashir (2013) discovered a positive connection between credit growth and NPLs. However, Boudriga *et al*, (2010) argue that a rise in credit supply results in reduced loan defaults, suggesting a negative correlation between credit growth and NPL. Their findings imply that banks that primarily concentrate on lending activities tend to have lower levels of non-performing loans. This could suggest that by focusing on credit operations, banks can more effectively evaluate credit risk. This study anticipated a positive relation between loan growth and NPLs.

### 3.7.6. LOAN TO DEPOSIT RATIO (LDR)

As explained by Suryanto (2015), the Loan to Deposit Ratio (LDR) is a measurement that determines the ratio of a bank's total loans in comparison to its deposits, which helps assess the ability of the bank to reimburse its depositors when they request a withdrawal of their funds. Muhammad *et al*, (2020) state that this ratio is employed to determine a bank's liquidity by comparing its total loans to its overall deposits over a specific time frame. The bank's LDR can indicate the potential for credit availability. As the amount of credit provided increases, the bank in question must bear a greater level of risk. This implies that a higher LDR for a bank corresponds to a higher probability of credit risk, and vice versa (Muhammad Khafid *et al*, 2020). In this analysis, it is anticipated that the LDR will have a positive relationship with NPLs

### 3.7.7. INCOME DIVERSIFICATION

Income diversification is a strategy that enables an entity to explore new business areas with diverse products and services, aiming to mitigate risk and enhance profitability. This approach is typically employed to address the challenges posed by intense competition in the credit market and to minimize risks associated with lending. Banks' income diversification can be calculated by the ratio of non-interest income to their total assets. The benefits of income diversification are not universally agreed upon (Berhanu, 2019).

Ghosh (2015) asserts that banks with a broader range of income sources tend to exercise greater caution, thereby reducing their risks by engaging less in high-risk credit activities. Subsequently, these banks exhibit better loan performance, implying a negative relationship between income diversification and NPL ratios. Conversely, Hu, Li, and Chiu (2004) contend that income diversification does not directly correlate with lower NPL ratios, as it heavily relies on how effectively banks diversify their income. As such, they propose that there is no relationship between income diversification and NPLs. In this analysis, the anticipated coefficient sign between income diversification and NPLs is negative.

### 3.8. MODEL SPECIFICATION

BS (bank size), LG (loan growth), NIM (net interest margin), LDR (loan to deposit ratio), ROA (return on asset), CAR (capital adequacy ratio), ROE (return on equity), and ID (income diversification) are the variables this study will look at in relation to NPL. The variables were selected from a variety of articles that were discussed in the empirical literature.

The regression model of this study is estimated in the following form:

$$NPL_{it} = \beta_0 + X'_{it}\beta_i + \rho_{it} + \varepsilon_{it} \quad (1)$$

Where  $NPL_{it}$  represents NPL of bank  $i$  at time  $t$ , the vector  $X'_{it}$  captures the explanatory variables for bank  $i$  and time  $t$ . The explanatory variables considered are BS (bank size), LG (loan growth), NIM (net interest margin), LDR (loan to deposit ratio), ROA (return on asset), CAR (capital adequacy ratio), ROE (return on equity), and ID (income diversification).  $\beta_0$  is an intercept term; the vector  $\beta_i$  represents 8 coefficients for all explanatory variables.  $\rho_{it}$  is bank-year fixed effect that controls any time varying exogenous variation across banks that are not captured by the explanatory variables, and  $\varepsilon_{it}$  represents measurement and specification error term capturing heterogeneity among banks and stochastic time elements. The error term is assumed to be normally

distributed with mean zero and constant variance. The time  $t$  represents 2006 to 2021. The econometric estimation employed is the fixed-effect panel model. All variables are entered as a percentage. Note that  $\rho_{it}$  bank-year fixed effect is entered in the econometric specification to avoid any omitted variable biases.

The description of the variables, together with their measurement and predicted sign, are shown in table 3.3

Table 3.3 Summary of the study variables

S.N	Description	Scale	Data source	Exptd sign
1	Non-performing loan	%	NPL/Total Loan	
2	Loan to deposit	%	Total Outstanding Loan/Total Deposit	+
3	Return on equity	%	Net profit/Total Asset	-
4	Capital adequacy ratio	%	Bank capital/risk weighted asset	-
5	Loan growth	%	Current year's outstanding growth compared to the previous year's outstanding	+
6	Bank size	%	Log (Total Asset)	-
7	Net interest margin	%	Net interest income/ average interest earning asset	+
8	Return on equity	%	Net profit/total equity	-
9	Income diversification	%	Non-interest income/total asset	-

Organized by the researcher from different literature

## CHAPTER FOUR

### 4. DATA ANALYSES AND DISCUSSION

This chapter discusses the findings of the study. There are three sections in the chapter. Descriptive statistics of dependent and independent variables are covered in the first section. The second section examines the variables' diagnostic tests. The third section presents and explains the findings from regression analyses of the factors that determine NPLs in commercial banks in Ethiopia.

#### 4.1. DESCRIPTIVE STATISTICS

The mean, median, maximum, minimum, and standard deviation of the dependent variables and the independent variable are summarized in the table below, over the period 2006-2021.

Table 4.1. Descriptive statistics

Variable	observation	Mean	Std dev	Min	Max
NPL	197	5.18	3.767736	0.2	22.5
LnBS	203	9.244895	1.5671	5.411646	13.80679
LG	196	38.66	30.02	(9.98)	226.54
NIM	202	5.11	1.70	0.5	9.26
LTD	197	64.42	13.12	29.69	129.59
ROE	201	22.30	12.38	(14.14)	77.70
LL	202	507.96	1720.93	1	15026.4
ID	203	0.03	0.02	0.00093	0.097
ROA	197	2.82	1.11	(3.76)	6.72
CAR	181	14.67	4.59	4	30

*Note NPL (non-performing loan) , BS(bank size) ,LG (loan growth) ,NIM (net interest margin), LDR(loan to deposit ratio) ROE (return on equity) ,ID (income diversification ) ,CAR (capital adequacy ratio)*

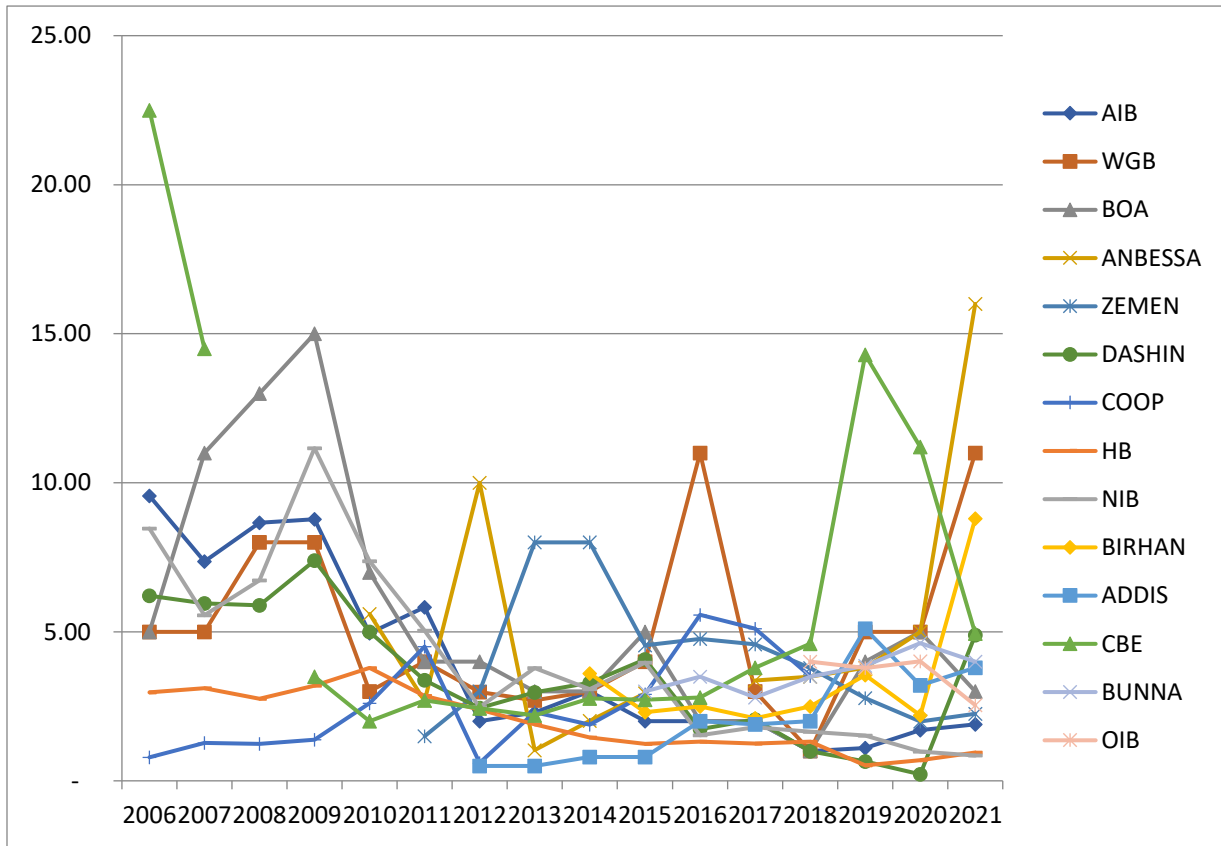
NPLs ratio is measured by Non-performing loans divided by total loan, ranging from 0.2 to 22.5 % the minimum amount of NPL registered by Dashen bank in 2020 and the maximum NPLs rate registered by CBE in 2006. Its standard deviation is 3.77% and its mean is 5.18% which indicate that from the total loan that ECBs disbursed an average of 5.18 were being defaulted.

When we see the LDR ratio which is measured by total loan to total deposit, it has a minimum of 29.69% and a maximum of 129.59%. Its mean is 64.42%, and its standard deviation from the mean is 13.12%. When it comes to profitability ratios, ROA has a range of -3.76 to 6.72, with a mean value of 1.1. From the data presented in Table 4.1, it can be observed that the Return on Equity (ROE) for CBEs range from -14.14% to 77.70%, with an average of 22.30%. This indicates that CBEs generally exhibit satisfactory performance when it comes to ROE. Moreover, CAR is also calculated by the ratio of total capital to risky assets, which ranges from 4 to 30 and has mean values and standard deviations of 14.67 and 4.59, respectively. This suggests that during the study period, capital adequacy for the sample commercial banks in Ethiopia was higher than the 8% minimal criterion.

#### 4.2. NON-PERFORMING LOANS TREND (2006-2021)

This analysis presents a trend of NPLs in commercial banks in Ethiopia from 2006 to 2021. In the accompanying Figure 4.1, the NPLs of Ethiopian commercial banks are represented on the y-axis, while the years are displayed on the x-axis.

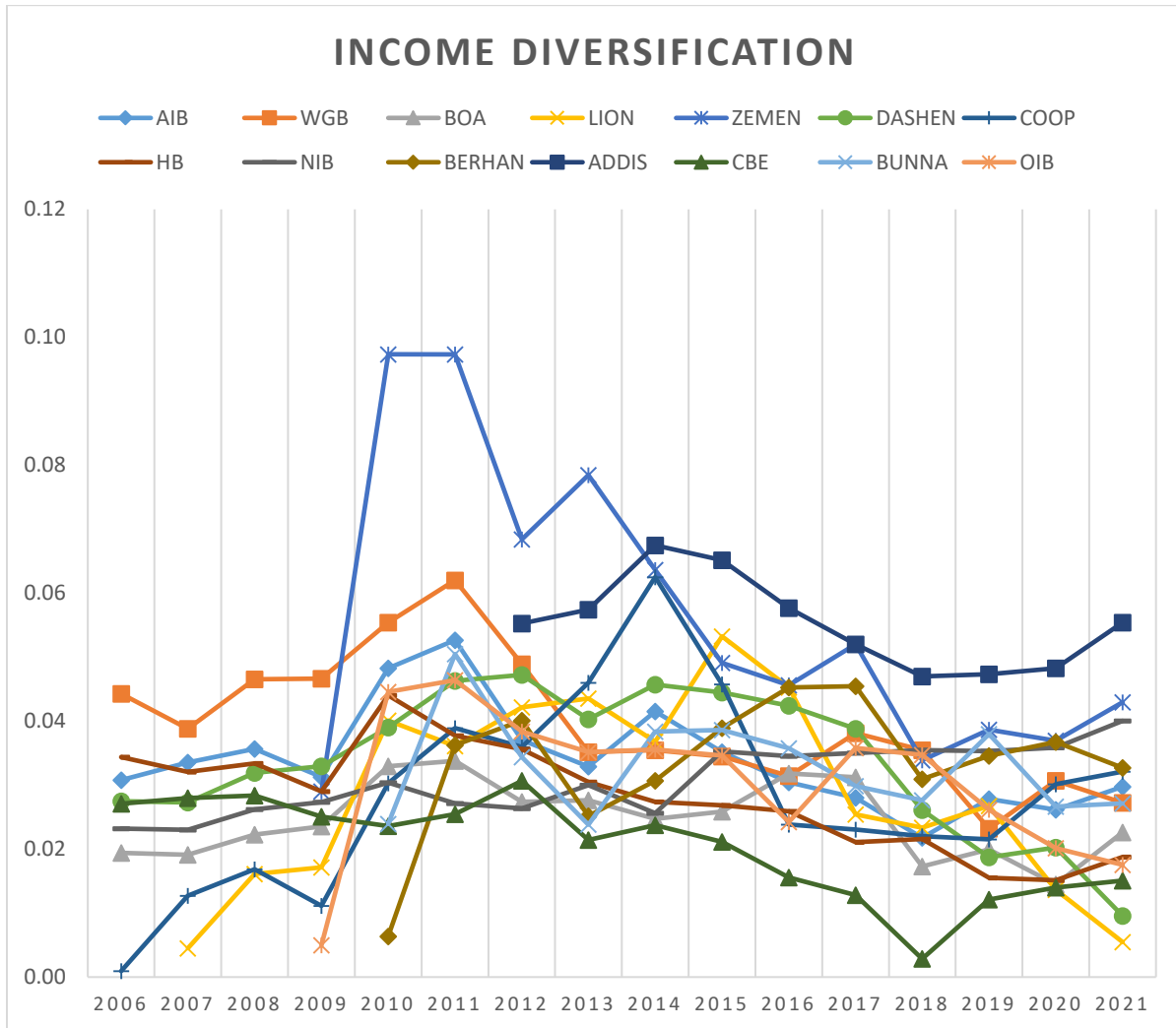
Figure 4.1 Non-performing loan trend



Source: compiled by a researcher from the raw data

The trends of the NPLs for commercial banks in Ethiopia, as illustrated in Fig. 4.1, exhibit a declining pattern from 2006 to 2021. Despite the decrease in the NPLs ratio over these years, the descriptive findings indicate that the commercial banks in Ethiopia continue to have a higher NPLs rate compared to the industry average. Furthermore, it is evident that some banks have experienced an increasing trend in their NPLs ratio after 2019.

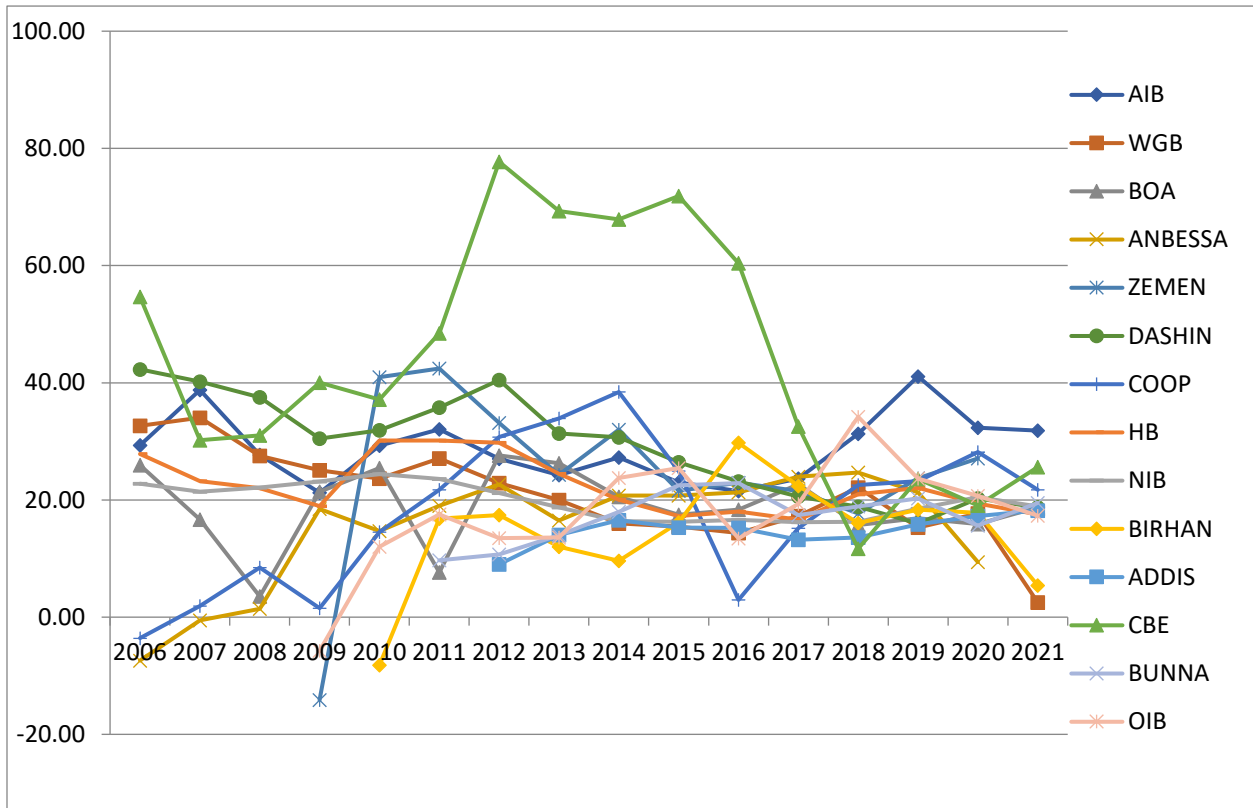
Figure 4.2: income diversification of commercial banks of Ethiopia



Source: compiled by a researcher from the raw data

From Figure 4.2, we have observed that, Awash international bank has higher ID ratio in 2010 and 2011 which implies that the bank aggressively exercise the strategy that enables to explore new business areas with diverse products and services from 2009 to 2011. Addis international bank is the second having larger ID ratio in 2014. In general, the above selected banks' income diversification is showing a fluctuating and decreasing trend resulted from lack of consistent employment of ID strategy to involve various income sources and to address challenges posed by intense competition in the market.

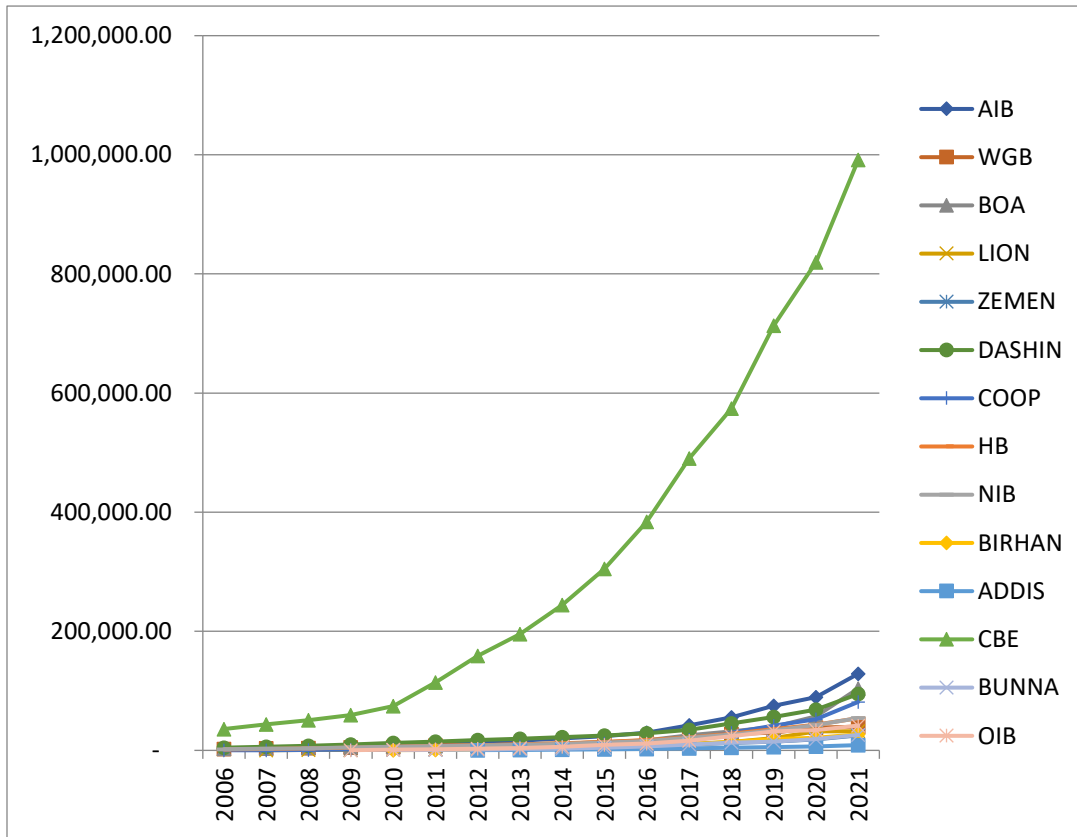
Figure 4.3 Return on equity



Source: compiled by a researcher from the raw data

Figure 4.3 demonstrates that the Commercial Bank of Ethiopia effectively utilized its shareholders' investments to generate substantial profits (ranging between 40% and 77%) from 2009 to 2015, before experiencing a decline from 2016 onwards. In contrast, Zemen Bank and Oromia International Bank had negative returns on shareholder investments in 2009, with values of -14.14 and -5.74, respectively.

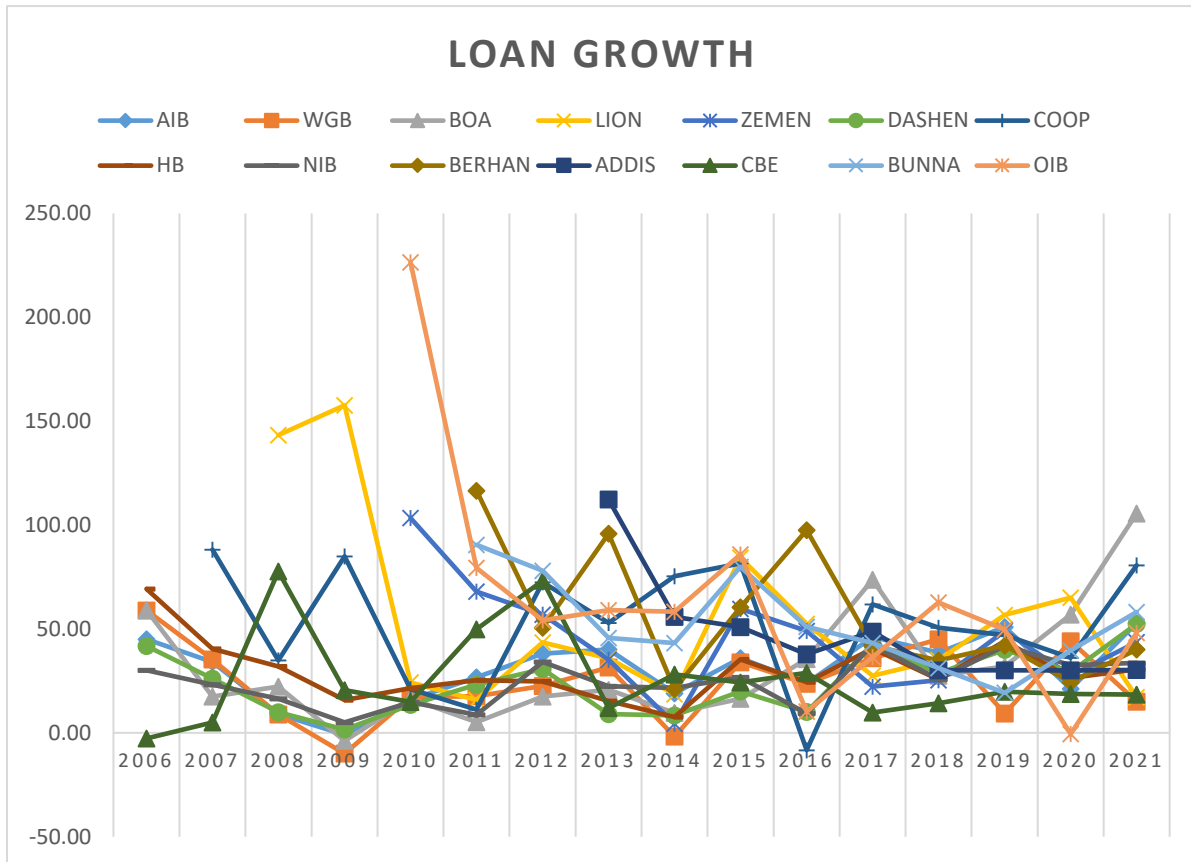
Figure 4.4 bank size



Source: compiled by a researcher from the raw data

Figure 4.4 demonstrates the scale of banks in Ethiopia, using their total assets as an indicator. It is evident that the state-owned Commercial Bank of Ethiopia possesses the most significant proportion of total assets among Ethiopian banks. This also indicates that the Commercial Bank of Ethiopia is the country's largest bank, followed by Awash Bank.

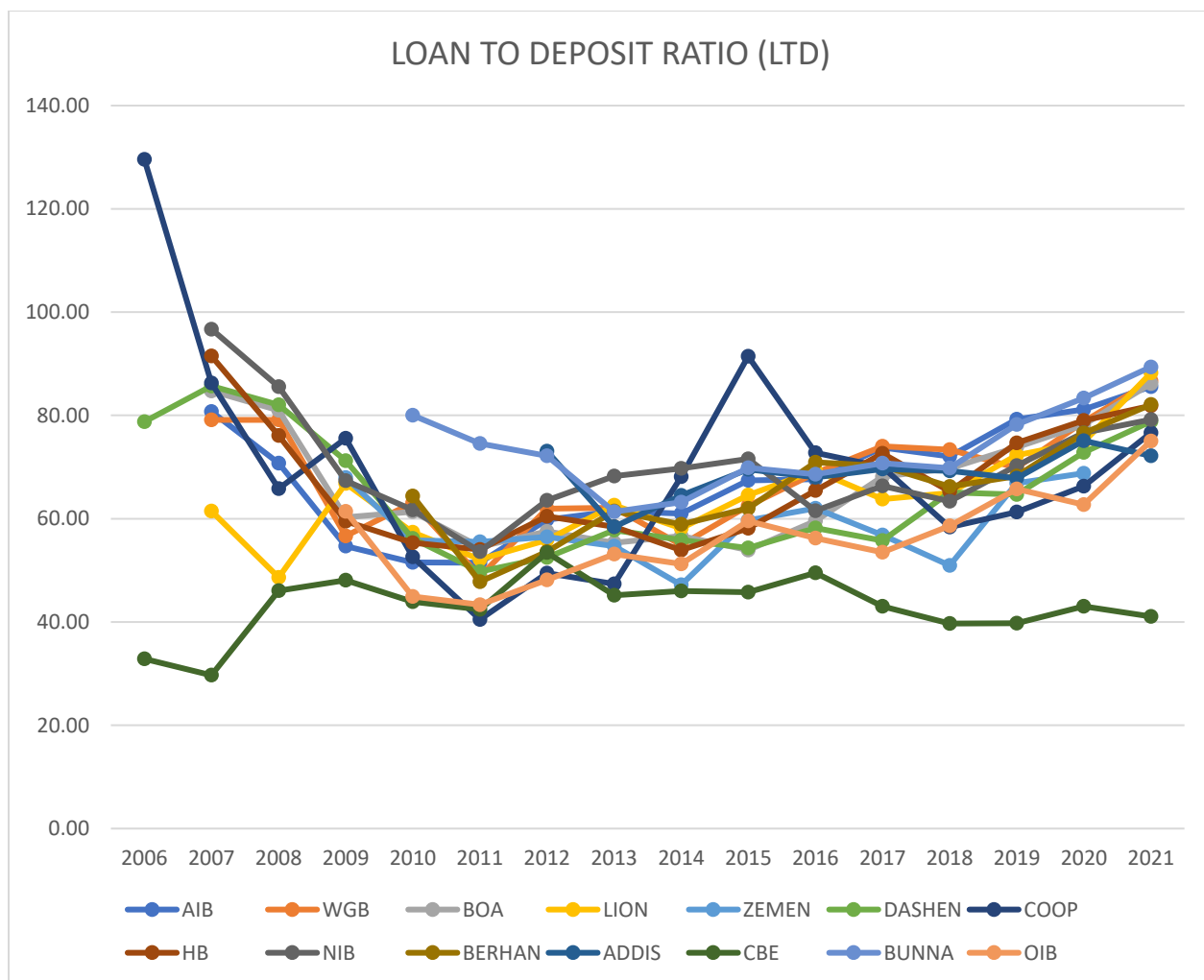
Figure 4.5 loan growth



Source: compiled by a researcher from the raw data

Figure 4.5 illustrates the growth of loans in Ethiopian banks, revealing that loan growth was fairly significant prior to 2014. In 2010, Oromia International Bank experienced the highest loan growth rate, reaching 225%. Examining the loan growth pattern of the Commercial Bank of Ethiopia reveals a declining trend following 2011. In more recent years, it appears that the majority of banks have exhibited a similar pattern in their loan growth.

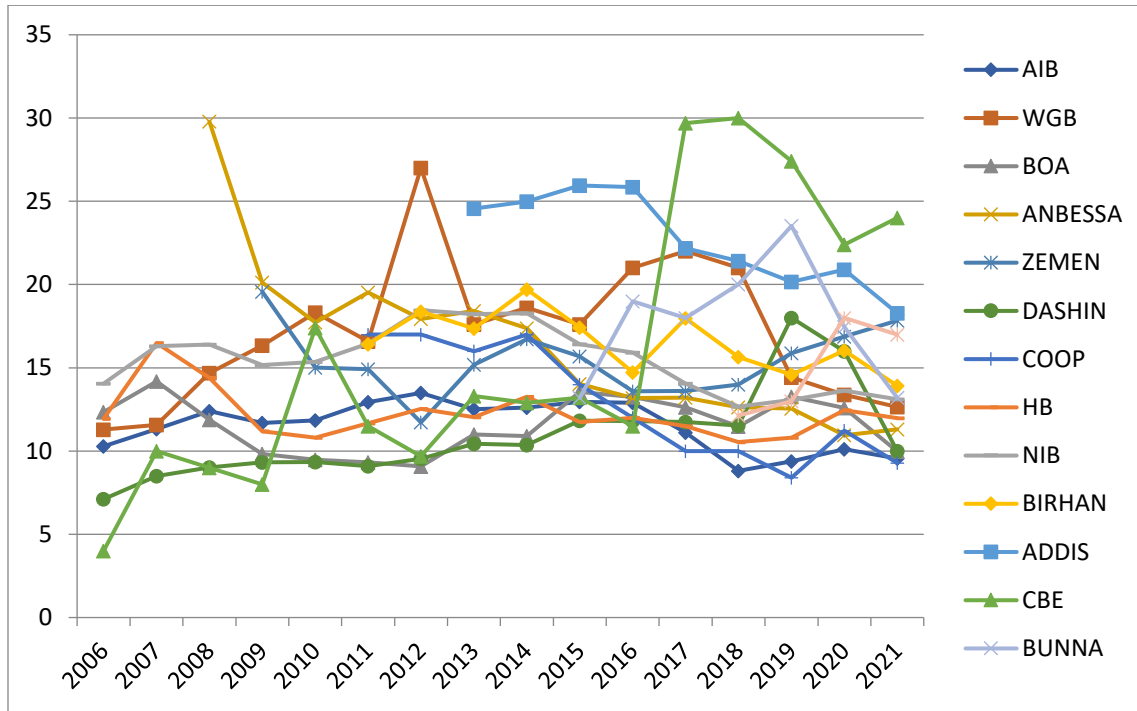
Figure 4.6: loan to deposit ratio



Source: compiled by a researcher from the raw data

Figure 4.6 displays the loan-to-deposit ratios for all commercial banks. Bunna Bank records the highest LDR, followed by Awash Bank and Hiberet Bank. In 2015, Corporate Bank of Oromia registered the highest LDR. The National Bank of Ethiopia (NBE, 2018) mandates that this ratio should not exceed 80%. However, the data presented in Figure 4.6 reveals that both Bunna Bank and Awash Bank have loan-to-deposit ratios surpassing the 80% threshold

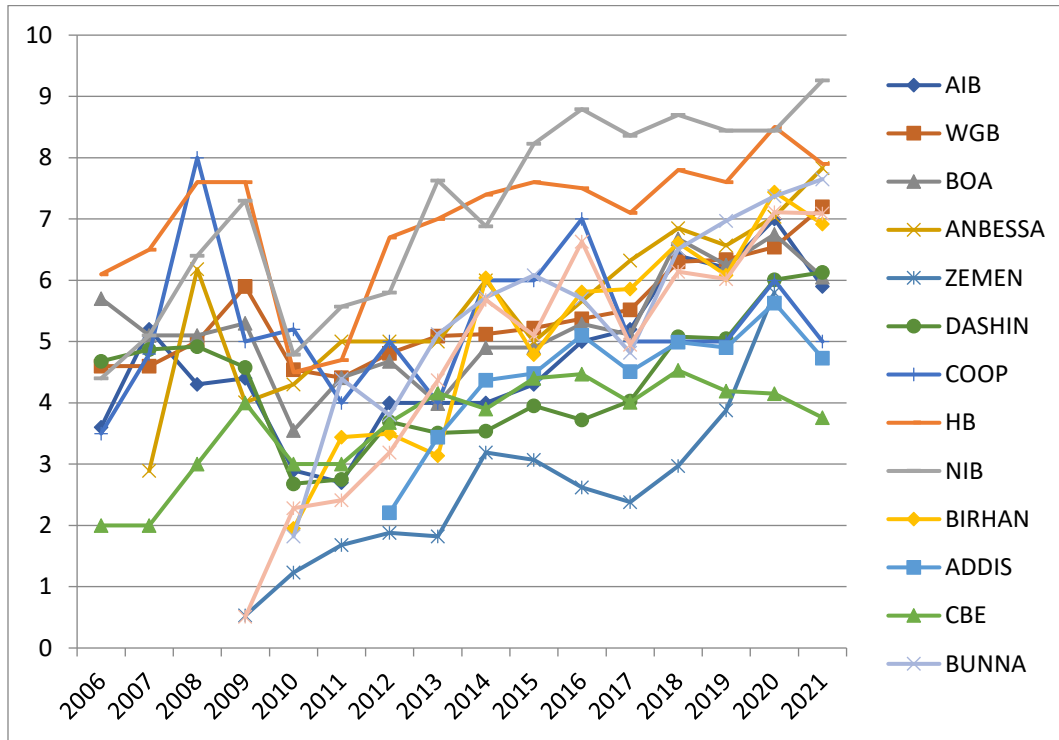
Figure 4.7 capital adequacy ratio



Source: compiled by a researcher from the raw data

Figure 4.7 illustrates that commercial banks in Ethiopia satisfy the CAR requirement set by the Central Bank of Ethiopia. The data presents the Ethiopian Commercial Bank as having the highest CAR from 2017 to 2021. This ratio serves as an indicator of the banks' stability and solvency. Additionally, the figure indicates that Addis International Bank records the second highest CAR.

Figure 4.8: net interest margin



Source: compiled by a researcher from the raw data

As illustrated in Figure 4.8, the NIM of all commercial banks exhibit a comparable trend. The graph reveals that Nib banks possess the highest NIM, followed by Hibret bank, a greater NIM is associated with increased income generated by banks from their portfolios. Moreover, the figure also indicates that both Zemen Bank and the Commercial Bank of Ethiopia have relatively lower NIMs.

### 4.3. TEST FOR CLASSICAL LINEAR REGRESSION ASSUMPTION

#### 4.3.1. NORMALITY TEST

With the normality assumption, the OLS estimator's  $\hat{\beta}_i$  are minimum-variance estimators in the entire class of unbiased estimators, whether linear or not. In short, they are BUE (best unbiased estimators) if our objective is estimation as well as inference, then, we need to assume that the  $u_i$  follow some probability distribution Gujarati (2004). The histogram result indicates in the Appendix 1, the residual is normally distributed.

#### 4.3.2. TEST FOR HOMOSCEDASTICITY

One assumption of the classical linear regression model (CLRM) is homoscedasticity, which asserts that the variance of the residuals for each explanatory variable (i.e., the conditional variance of  $u_i$ ) remains a constant positive value denoted as  $\sigma^2$ , Gujarati (2004). Therefore, the Breusch-Pagan or Cook Weisberg test was used in this work to identify the heteroscedasticity issues. According to this test, the data have a heteroscedasticity problem if the p-value is significant at 95 percent confidence interval, but not if the value is insignificant (more than 0.05). Because there is heteroscedasticity issue for this study, as indicated in appendix 2, hence, the (p value) is less than 0.05 which is significant so to correct the problem of heteroscedasticity the researcher will use heteroscedasticity robust standard error.

#### 4.3.3. TEST FOR MULTICOLLINEARITY

Multicollinearity refers to a high (though not perfect) correlation between two or more independent variables, leading to overlapping or shared predictive power. When independent variables exhibit multicollinearity, their regression coefficients become indeterminate, and their standard errors cannot be accurately measured (Woodridge, 2014). Perfect multicollinearity is a situation where the independent variables' coefficients and standard errors are entirely unmeasurable (Gujarati, 2004).

Table 4.2 Correlation analysis

	NPL	NIM	LTD	ROE	ID	CAR	lnbs	Lg	ROA
NPL	1.0000								
NIM	-0.2230	1.0000							
LTD	-0.0007	0.5552	1.0000						
ROE	0.0584	-0.3819	-0.3462	1.0000					
ID	-0.1427	-0.4431	-0.2045	0.0160	1.0000				
CAR	-0.0843	0.0115	-0.0410	-0.2830	0.2299	1.0000			
Lnbs	-0.0804	0.1255	-0.1683	0.3137	-0.5673	-0.0987	1.0000		
Lg	-0.2386	-0.0922		0.0326	-0.0184	-0.0695	0.1462	1.0000	

			-0.1021						
ROA	-0.1599	-0.3079	-0.1065	0.3933	0.6530	0.1867	-0.4718	-0.0374	1.0000

Source STATA correlation output, Pearson correlation matrix.

Correlation analysis is a method for evaluating the strength of the relationship between two or more variables. If the correlation coefficient is zero, it indicates no linear connection among variables, with the coefficient ranging from -1 (indicating a perfect negative correlation) to +1 (indicating a perfect positive correlation). The results of our analysis suggest that there is no significant correlation overall. VIF is also employed to corroborate the results of the Pearson correlation matrix. The average of VIF of the variables being 1.60, which is significantly lower than the threshold of 10. Additionally, the VIF of each individual variable is relatively low, implying that there was no correlation among the explanatory variables used in the model.

#### 4.3.4. STATIONARITY TEST

Unit root tests are essential for determining if a specific variable or series is stationary, meaning that its statistical characteristics, such as mean and variance, do not change over time. The series is not stationary if there is a unit root present. In panel data analysis and policy decision-making, non-stationary data can result in false or misleading regression outcomes, which is why unit root tests are crucial when studying large time spans. The unit root test results show that CAR, NIM, LDR, lnBS, ROA, and ID are stationary at the level, whereas LG and ROE are stationary at the first difference.

#### 4.4. RESULT IN REGRESSION ANALYSIS

This section gives the results of a regression analysis using a fixed effect model that was used to investigate the determinants of Ethiopian commercial banks' non-performing loans.

Table 4.3. Regression result

Variable	Coefficient	Standard error	P> t
lnBS	-0.20	.2130981	0.350
D.LG	-0.03	.004919	0.000*
CAR	-0.14	.0690084	0.062***

ROA	-1.32	.062064	0.015**
ID	-0.43	0.40	0.266
D. ROE	.014	.0499429	0.771
NIM	0.269	.4558974	0.564
LDR	0.01	.0444225	0.940
Rho 52.15%			
P value 0.0001			
R <sup>2</sup> 23%			

*Note significant at 1%, \*significant at 5%\*\* , and significant at 10% \*\*\**

NPLs are influenced by various factors, as illustrated in Table 4.3. These factors include bank size, loan growth, return on equity, capital adequacy ratio, income diversification return on asset, net interest margin, and loan-to-deposit ratio. Furthermore, Rho demonstrates that specific features of the selected cross-sectional entities, such as commercial banks in Ethiopia, account for 52.15% of the variation in NPLs. The fixed effect regression results indicate that capital adequacy, loan growth, and return on assets significantly and negatively impact NPL, with coefficients of -0.14, -0.03, and -1.32, respectively. On the other hand, bank size, return on equity, net interest margin, and income diversification have an insignificant and negative effect on NPL. Furthermore, loan deposit ratios and return on equity show a positive and insignificant influence.

#### 4.5. DISCUSSION

The primary goal of this study was to investigate bank specific factors that influence non-performing loans in commercial banks in Ethiopia. The outcomes of a Fixed Effect Model, which illustrates how explanatory variables affect NPLs, are shown below.

##### 4.5.1. CAPITAL ADEQUACY RATIO

According to the research findings, there is a significant relationship between CAR and NPLs. CAR represents the bank's capital strength and solvency, with a higher capital base enabling banks to endure potential credit market shocks. These study discovered that a negative correlation between NPL and CAR, implying that as capital decrease, banks may engage in riskier lending activities, resulting in more loan losses. This could lead to moral hazard behavior among bank managers, causing a rise in NPLs. These results are consistent with Keeton and Morris (1987), who state that banks with relatively low capital levels are more likely to respond to moral hazard

incentives by making their loan portfolios riskier. Consequently, this leads to a higher average of NPLs in the future.

#### 4.5.2. LOAN GROWTH

Loan growth is the average growth in a bank's total loans less the allowance for loan losses at the end of its four fiscal quarters of a year, and it might reflect a bank's market share. This analysis discovered a negative relationship between loan growth and NPLs, which was contrary to the researcher's hypotheses. The fact that loan growth has a negative effect on NPL suggests that banks that extend more credit have a tendency to focus more on credit-related operations, making them more adept at using credit scoring, evaluation, and monitoring systems. These banks can gradually lower the number of NPLs in the current year by focusing on lending activity. Besides, in response to increasing NPLs, banks may adopt more prudent lending practices and this may involve tighter credit standards which could lead to slower loan growth as they become more cautious in extending credit to borrowers.

This study found similar results to Boudriga *et al*, (2009), and it supports the relationship by arguing that banks might adopt a more lenient credit policy to decrease NPLs, such as turning insolvent loans into solvent ones by restructuring them. Alternatively, banks may simply increase the total amount of loans by providing new loans in order to lower the NPL ratio. Since the NPL ratio is calculated by dividing the total number of loans by the NPL amount, this leads to an increase in credit supply being followed by a decrease in the NPL ratio.

#### 4.5.3. RETURN ON ASSET

With a coefficient of 1.32 and a p-value of 0.015, which is below the 5% threshold, the findings of this study demonstrate a significant negative linkage between bank profitability, as assessed by Return on Assets (ROA), and NPLs. These results support the research hypothesis. This conclusion implies that when a bank's ROA increases, suggesting a positive past performance, the bank would generally be more profitable. As a result, bank managers might not engage in overly risky activities because managers are subjected to less pressure for generating profits, eventually leading to diminished exposure to credit risks.

## CHAPTER FIVE

### 5. CONCLUSIONS AND RECOMMENDATIONS

#### 5.1. CONCLUSIONS

This study investigates the determinants of NPL over a period from 2006 to 2021, using panel data from fourteen selected commercial banks to assess the factors influencing NPLs. The research employed a fixed-effect model and descriptive statistics to assess and identify the impact of bank-specific factors on NPL, using data from sixteen years. The findings from this research largely consistence with those from several past studies, though there are a few exception. One of the crucial determinants discovered in the study is the capital adequacy ratio, which measures a bank's strength, capital adequacy ratio negatively and significantly determine NPL. This result is in line with the findings of Keeton and Morris (1998). The study suggests that banks with a higher capital adequacy ratio can better absorb market shocks. This result is consistent with the research hypothesis. Additionally, the study found a statistically significant negative relationship between return on asset and NPLs. This result indicates that when banks experience higher levels of return on asset or have a strong past performance, bank managers feel less pressure to generate profits, leading to lower credit risk exposure. This finding aligns with the work of Curak *et al*, (2013)

Moreover, the research findings indicate a negative relationship between loan growth and NPLs which contradicts the initial hypothesis. The researcher hypothesized that there would be a positive relationship between loan growth and NPLs. But, the results revealed a negative and significant relationship. This finding supports the work of Boudriga *et al*, (2010), who posited that a negative relationship may exist if banks adopt lenient credit policies, such as converting insolvent loans into solvent loans through restructuring. This finding is also in line with the research by Mehari (2012), as cited by Tsige (2013), which stated that the reduction of NPLs in ECBs was not due to improved credit risk management and supervision but rather a result of restructuring and writing off NPLs. In general, research findings indicate that loan growth, capital adequacy ratio, and return on asset have a negative relationship with NPL.

On the other hand, bank size showed an inverse relationship with the dependent variable NPL in terms of the anticipated sign, but not in terms of magnitude. The study found that the loan deposit ratio variable had a positive relationship with prior expectations in terms of sign, but did not have a significant magnitude at a level below 5%. This finding is consistent with Louzis *et al*, (2010)

who examined the factors influencing non-performing loans in Greece's financial sector and found that the loan-to-deposit ratio had insignificant effects on non-performing loans. Similarly, Guy and Lowe (2011) found a positive but insignificant impact of the loan-to-deposit ratio on non-performing loans. Additionally, this research discovered a negative and statistically insignificant correlation between NIM and NPLs, as well as between ID and NPLs, with the anticipated sign only. The findings also indicated a negative link between income diversification and NPLs, which is in line with Ghosh (2015), who suggested that there is a negative relationship between NPLs and income diversification.

## 5.2. RECOMMENDATIONS

The research indicates that commercial banks with sufficient capital adequacy ratio experience fewer NPLs because they demonstrate superior abilities in evaluating and overseeing their loan portfolios. Furthermore, commercial banks that meet the minimum capital adequacy ratio requirements are protected from the risk of bankruptcy, better equipped to handle financial crises, and other unforeseen events. As a result, the study suggests that both regulators and bank executives should prioritize maintaining a robust capital adequacy ratio.

Furthermore, banks that encounter increased loan expansion ought to embrace more cautious lending approaches, stricter credit criteria, and establish resilient credit assessment and surveillance systems. These measures may result in a deceleration of loan growth as the banks exercise caution when extending credit to borrowers.

A higher ROA indicates improved profitability and more efficient use of assets. If a bank has demonstrated strong past performance, managers may be less likely to engage in high-risk activities, which can help maintain a lower NPL ratio. Consequently, a higher ROA may lead to better risk management practices and tighter lending standards, reducing the likelihood of NPLs.

## REFERENCES

- Abebe, D. (2021). *Determinants of non-performing loan in Ethiopia commercial banks* (Doctoral dissertation, St. Mary University).
- Ahmad, F., & Bashir, T. (2013). Explanatory power of bank specific variables as determinants of non-performing loans: Evidence from Pakistan banking sector. *World Applied Sciences Journal*, 22(9), 1220-1231.
- Ahmed, S., Majeed, M. E., Thalassinou, E., & Thalassinou, Y. (2021). The impact of bank specific and macro-economic factors on non-performing loans in the banking sector: evidence from an emerging economy. *Journal of Risk and Financial Management*, 14(5), 217.
- Akinlo, O., & Emmanuel, M. (2014). Determinants of non-performing loans in Nigeria. *Accounting & taxation*, 6(2), 21-28.
- Anisa, U. (2015). The Determinants of Nonperforming Loan in Ethiopian Commercial Banks.
- Argaw, S. A. (2016). Factors Affecting Non-Performing Loans: In Case of Commercial Bank of Ethiopia. *Mekelle University*.
- Ari, A., Chen, S., & Ratnovski, L. (2020). COVID-19 and non-performing loans: lessons from past crises. *Available at SSRN 3632272*.
- Asset Classification and Provisioning Directive. ( No. SBB/43/2008). National Bank of Ethiopia, Addis Ababa.
- Auronen, L. (2003, May). Asymmetric information: theory and applications. In *Seminar of Strategy and International Business at Helsinki University of Technology* (Vol. 167, pp. 14-18).
- Badar, M., Javid, A. Y., & Zulfiquar, S. (2013). Impact of macroeconomic forces on nonperforming loans: An empirical study of commercial banks in Pakistan. *Wseas Transactions on Business and Economics*, 10(1), 40-48.
- Barr, R. S., & Siems, T. (1994). *Predicting bank failure using DEA to quantify management quality* (No. 94-1). Federal Reserve Bank of Dallas.
- Barr, R. S., & Siems, T. F. (1997). Bank failure prediction using DEA to measure management quality. *Interfaces in Computer Science and Operations Research: Advances in Metaheuristics, Optimization, and Stochastic Modeling Technologies*, 341-365.
- BELAY, T. (2020). *Determinant of non-performing loans in Ethiopian commercial banks*. (Doctoral dissertation, St. Mary's University).
- Berhanu, B.(2019). Determinants of non-performing loans in Ethiopian commercial banks. Addis Ababa University

- Bolt, W., & Tieman, A. F. (2004). Banking competition, risk and regulation. *Scandinavian Journal of Economics*, 106(4), 783-804.
- Burton, M., Nesiba, R. F., & Brown, B. (2015). *An introduction to financial markets and institutions*. Routledge.
- Boudriga, A., Taktak, N. B., & Jellouli, S. (2010, September). Bank specific, business and institutional environment determinants of banks nonperforming loans: evidence from mena countries. In *Economic research forum, working paper* (Vol. 547, pp. 1-28).
- Breuer, J. B. (2006). Problem bank loans, conflicts of interest, and institutions. *Journal of financial stability*, 2(3), 266-285.
- Brooks, C. (2008). *Introductory Econometrics for Finance second edition* published in the United States of America by Cambridge University Press. *New York*.
- CFITeam.,(2020).Principal-agent problem.<https://corporatefinanceinstitute.com/resources/economics/principal-agent/>
- Cheng, M. C., Lee, C. C., Pham, Q. N. T., & Chen, H. Y. (2016). Factors affect NPL in Taiwan banking industry. *Journal of Accounting*, 6(1), 65-87.
- Cheng, M. C., Lee, C. C., Pham, Q. N. T., & Chen, H. Y. (2016). Factors affect NPL in Taiwan banking industry. *Journal of Accounting*, 6(1), 65-87.
- Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). Thousand Oaks, CA: Sage Publications.
- Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.
- Demyanyk, Y., & Van Hemert, O. (2011). Understanding the determinants of NPLs in the absence of a definitive theoretical framework. *Journal of Financial Stability*, 7(2), 107-119.
- Dhar, S., & Bakshi, A. (2015). Determinants of loan losses of Indian Banks: a panel study. *Journal of Asia Business Studies*, 9(1), 17-32.
- Eveline, N. (2010). *Credit Risk Management In Banks As Participants In Financial Markets.: A qualitative study of the perception of bank managers in Sweden (Umeå region)*.
- Ewert, R., Schenk, G., & Szczesny, A. (2000). Determinants of bank lending performance in Germany: evidence from credit file data. *Schmalenbach Business Review*, 52, 344-362.
- Fendi, U., Sawalha, I., Shamieh, J., & Jaara, O. O. (2017). Early Warning Indicators for Monitoring Non-Performing Loans in Jordanian Banking System. *International Journal of Business and Social Science*, 8(6), 104-114.
- Fernández de Lis, S., Martínez Pagés, J., & Saurina Salas, J. (2000). *Credit growth, problem loans and credit risk provisioning in Spain*. Banco de España. Servicio de Estudios.

- Gaitho, E. W. (2010). *A survey of the causes of non-performing loans of Commercial banks in Kenya* (Doctoral dissertation).
- Geletta, W. N. (2012). *Determinants of non-performing loans: the case of Ethiopian banks* (Doctoral dissertation).
- Gezu, G. (2014). *Determinants of nonperforming loans: Empirical study in case of commercial banks in Ethiopia* (Doctoral dissertation).
- Ghosh, A. (2015). Banking-industry specific and regional economic determinants of non-performing loans: Evidence from US states. *Journal of financial stability*, 20, 93-104.
- HU, J. L., Li, Y., & CHIU, Y. H. (2004). Ownership and nonperforming loans: Evidence from Taiwan's banks. *The Developing Economies*, 42(3), 405-420.
- International Monetary Fund. (2005). Annual Report 2005: Building institutions.
- Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of financial economics*, 3(4), 305-360.
- Jeong, S., & Jung, H. (2011). Banks' wholesale funding and credit pro-cyclicality: evidence from Korea.
- Jovovic, J. (2014). *Determinants of Non-Performing Loans: Econometric Evidence Based on 25 Countries* (Doctoral dissertation, Master Thesis, City University London).
- Keeton, W. R. (1999). Does faster loan growth lead to higher loan losses. *Economic review-Federal reserve bank of Kansas City*, 84(2), 57.
- Keeton, W. R., & Morris, C. S. (1987). Why do Banks' loan losses differ? *Economic review*, 72(5), 3-21.
- Khafid, M., & Anisykurlillah, I. (2020). Investigating the determinants of non-performing loan: Loan monitoring as a moderating variable. *Kne social sciences*, 126-136.
- Khemraj, T., & Pasha, S. (2009). The determinants of non-performing loans: An econometric case study of Guyana. Presented at the Caribbean Centre for Money and Finance 40th Annual Monetary Studies Conference, November 5 – 7, 2009.
- Kitila, W., Lemi, K., & Sultan, M. (2020). Determinants of Credit Risk: The Case of Selected Commercial Banks in Ethiopia. *International Journal of Business Administration and Management Research*, 5(4), 1-7.
- Mac, D. S.S., & Koch, T. (2006). *Management of Banking*, 6th edition, U.S.A.
- Makri, V., & Papadatos, K. (2014). How accounting information and macroeconomic environment determine credit risk? Evidence from Greece. *International Journal of Economic Sciences and Applied Research*, 7(1).

- Makri, V., Tsagkanos, A., & Bellas, A. (2014). Determinants of non-performing loans: The case of Eurozone. *Panoeconomicus*, 61(2), 193-206.
- Mehari, M. (2012). "credit risk management in Ethiopia banking industry". *MBA thesis, Addis Ababa University*.
- Msomi, T. S. (2022). Factors affecting non-performing loans in commercial banks of selected West African countries. *Banks and Bank Systems*, 17(1), 1.
- Muhammad, F., Ammara, S., & Abrar, H. (2012). Economic Determinants of Non-Loans: Perception of Pakistani Bankers. *Journal of Business and Management*, 4, 87-96.
- Mulatu, D. (2018). *Determinants of Non-Performing Loan in Development Bank of Ethiopia* (Doctoral dissertation, St. Mary's University).
- Muriithi, M. W. (2013). *The causes of non-performing loans in commercial banks in Kenya* (Doctoral dissertation, University of Nairobi).
- Musau, E. M. (2014). Modeling non-performing loans in Kenya Commercial Banks. *Unpublished master's thesis*. University of Nairobi, Nairobi.
- Nkusu, M. M. (2011). *Nonperforming loans and macro-financial vulnerabilities in advanced economies*. International Monetary Fund.
- Okyere, E., & Mensah, A. C. (2022). Macroeconomic and Bank Specific Determinants of Non-performing Loans in Ghanaian Banking Sector. *International Journal of Accounting, Finance and Risk Management*, 7(2), 40-48.
- Onchomba, F. O. (2014). The relationship between macroeconomic factors and non-performing loans in mortgage firms in Kenya.
- Oynaka, N. N. Factors Affecting Non-Performing Loans in Commercial Banking Sector: A Comparative Study of Public and Private Banks A Case Study of Commercial Bank of Ethiopia and Dashen Bank District in Southern Region of Ethiopia.
- Ozili, P. K. (2015). How bank managers anticipate non-performing loans. Evidence from Europe, US, Asia and Africa. *Evidence from Europe, US, Asia and Africa*, 73-80.
- Petersson, J., & Wadman, I. (2004). Non-Performing Loans-the markets of Italy and Sweden.
- Rachman, R. A., Kadarusman, Y. B., Anggriono, K., & Setiadi, R. (2018). Bank-specific factors affecting non-performing loans in developing countries: Case study of Indonesia. *The Journal of Asian Finance, Economics and Business (JAFEB)*, 5(2), 35-42.
- Radivojevic, N., & Jovovic, J. (2017). Examining of determinants of non-performing loans. *Prague Economic Papers*, 26(3), 300-316.

- Rajaraman, I., & Vasishtha, G. (2002). Non-performing loans of PSU banks: Some panel results. *Economic and Political weekly*, 429-435.
- Richard, E. (2010). Factors that cause non-performing loans in commercial banks in Tanzania and strategies to resolve them. *Moving Africa toward Sustainable Growth and Technological Development*, 11, 16-23.
- Romdhane, S. B., & Kenzari, K. (2020). The determinants of the volatility of Non-performing loans of Tunisian banks: Revolution versus COVID-19. *Review of Economics and Finance*, 18, 92-111.
- S. Mishkin, Frederic. *Financial market and institution*. Bosten, United State, 2013.
- Saba, I., Kouser, R., & Azeem, M. (2012). Determinants of non-performing loans: Case of US banking sector. *The Romanian Economic Journal*, 44(6), 125-136.
- Salas, V., & Saurina, J. (2002). Credit risk in two institutional regimes: Spanish commercial and savings banks. *Journal of Financial Services Research*, 22(3), 203.
- Saunders, A., & Cornett, M. M. (2008). *Financial institutions management: A risk management approach*. McGraw-Hill Irwin.
- Selma, M., & Jouini, F. (2013). Macro and Micro determinants of Non-performing loans in Tunisia. *International Journal of Economics and Financial Issues* 13 (3), pp. 852-860.)
- Sitana, A. (2018). Determinants of Non-performing Loans in Ethiopian Commercial Banks, *Addis Ababa University*.
- Škarica, B. (2014). Determinants of non-performing loans in Central and Eastern European countries. *Financial theory and practice*, 38(1), 37-59.
- Smith, C. W., & Stulz, R. M. (1985). The determinants of firms' hedging policies. *Journal of financial and quantitative analysis*, 20(4), 391-405.
- Suryanto, S. (2015). Non-performing loans on regional development bank in Indonesia and factors that influence. *Mediterranean Journal of Social Sciences*, 6(4), 280.
- Tehulu, T. A., & Olana, D. R. (2014). Bank-specific determinants of credit risk: Empirical evidence from Ethiopian banks. *Research journal of finance and accounting*, 5(7), 80-85.
- Tesfaye, T. (2012). Determinants of Banks Liquidity and their Impact on Financial Performance: empirical study on commercial banks in Ethiopia. *Unpublished Master's Thesis. Addis Ababa University. Ethiopia*.
- Tole, M. G., Jabir, M. S., & Wolde, H. A. (2019). Determinates of credit risk in Ethiopian commercial banks.
- Vatansever, M., & Hepsen, A. (2013). Determining impacts on non-performing loan ratio in Turkey. *Journal of Finance and Investment Analysis*, 2(4), 119-129.

Vithessonthi, C. (2016). Deflation, bank credit growth, and non-performing loans: Evidence from Japan. *International review of financial analysis*, 45, 295-305.

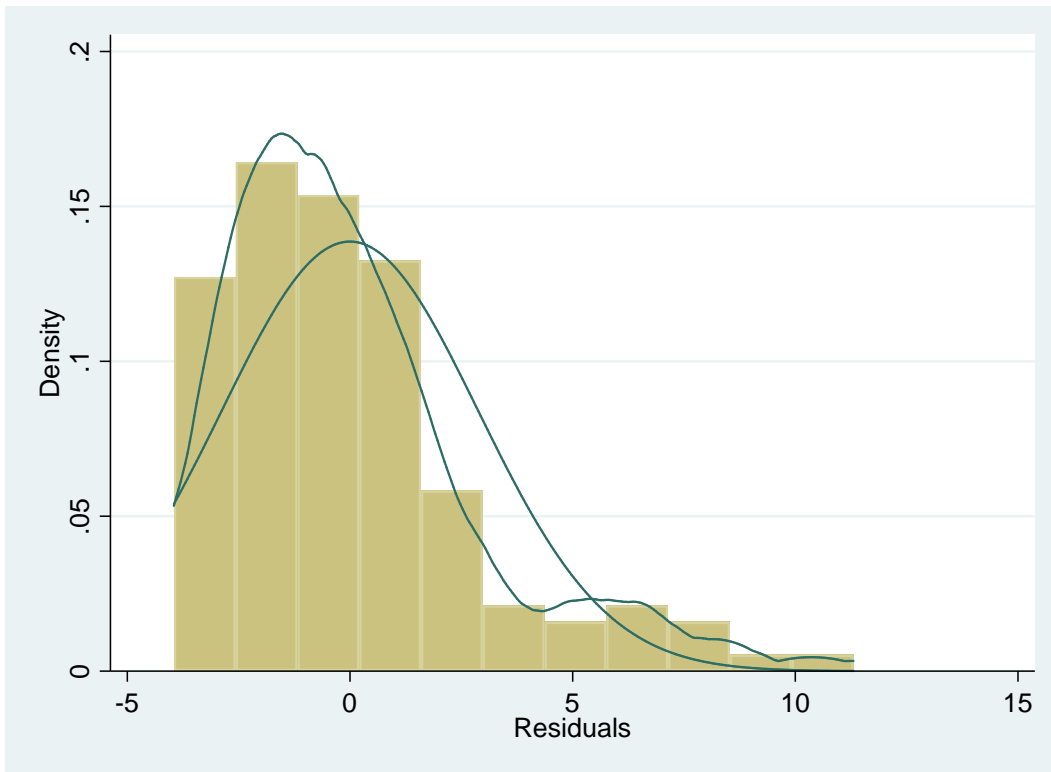
Williams, B. (2016). The impact of non-interest income on bank risk in Australia. *Journal of Banking & Finance*, 73, 16-37.

Wood, A., & Skinner, N. (2018). Determinants of non-performing loans: evidence from commercial banks in Barbados. *The Business & Management Review*, 9(3), 44-64.

Ye, Y., Wang, Y., & Yang, X. (2022). Bank loan information and information asymmetry in the stock market: Evidence from China. *Financial Innovation*, 8(1), 1-28.

## APPENDIX

Appendix 1: Normality test result



## Appendix 2 Result for homoscedasticity test

```
. hettest  
  
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity  
Ho: Constant variance  
Variables: fitted values of NPL  
  
chi2(1)      =    20.17  
Prob > chi2  =    0.0000
```

## Apendex3

## Result VIF

. vif

Variable	VIF	1/VIF
Id	2.35	0.425779
ROA	1.88	0.531878
NIM	1.77	0.565760
lnbs	1.69	0.590540
LTD	1.62	0.618598
ROE_diff	1.23	0.813458
Lg_diff	1.13	0.886503
CAR	1.12	0.892924
Mean VIF	1.60	