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**THE EFFECT OF RISK MANAGEMENT ON FINANCIAL
PERFORMANCE OF COMMERCIAL BANKS IN ETHIOPIA**

**THESIS SUBMITTED TO COLLEGE OF BUSINESS AND ECONOMICS
DEPARTEMENT OF ACCOUNTING AND FINANCE FOR THE PARTIAL
FULFILMENT OF THE DEGREE OF MASTER OF SCIENCE IN
ACCOUNTING AND FINANCE**

PREPARED BY: ABEL WASSU AGEGNEHU

ID.NO.GSE/9473/15

ADVISOR: DR. TAKELE FUFA

JUNE, 2025

ADDIS ABABA,

ETHIOPIA

Statement of Declaration

I, **Abel Wassu**, hereby declare that the thesis entitled “ **The Effect of Risk Management on Financial Performance of Commercial banks in Ethiopia**”, submitted to the Department of Accounting and Finance, College of Business and Economics, Addis Ababa University, in partial fulfillment of the requirements for the award of the Degree of Master of Science in Accounting and Finance (MSc), is my original work carried out during the year 2025. under the supervision and guidance of Takele Fufa (PhD).

I further declare that this thesis has not been submitted to any other university or institution for the award of any degree, diploma, associate ship, fellowship, or any other similar title.

Name: Abel Wassu Agegnehu

Signature 
Date 18/06/25

Statement of Certification

This is to certify that the thesis entitled “ **The Effect of Risk Management on Financial Performance of Commercial banks in Ethiopia**”, submitted to the **Department of Accounting and Finance, College of Business and Economics, Addis Ababa University**, in partial fulfillment of the requirements for the award of the Degree of Master of Science in Accounting and Finance (MSc), is a record of original research work carried out by **Abel Wassu Agegnehu** during the year 2025., under my supervision and guidance.

I further certify that this thesis has not been submitted for the award of any Degree, Diploma, Associate ship, Fellowship, or any other similar title at any other university or institution, and that it complies with the academic regulations and accepted standards of Addis Ababa University.

Advisor Name: Takele Fufa (PhD)

Signature: 

Date: 

Addis Ababa University
School of Graduate Studies

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Approved by:

Internal examiner: Aseaw Kessie Signature  Date 18-06-2025
External examiner: Lemessa Bannik Signature  Date 19/06/25
Advisor Name: Takele Fufa (PhD) Signature  Date 18/6/2025

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Abstract

The main aim of this study was to identify the effect of risk management on the financial performances of selected commercial banks in Ethiopia with a sample size of 16 commercial banks, covering the fiscal year of 2017/18-2023/24. To achieve this objective quantitative research approach were employed. Secondary data were gathered from NBE databases and annual audited financial statements of commercial banks. To comply with these objectives the study has used a panel data model with random effect generalized least squares regression (GLS). To test the hypotheses developed based on the literature review, the collected data were organized and assessed for the fulfillment of linear regression assumptions and apply the random effects linear regression model. The study's findings indicate that liquidity risk management, interest rate risk, and foreign exchange risk have a statistically significant and positive relationship with the return on asset of banks. In contrast, operational risk and bank size show a statistically significant and negative relationship with financial performance. However, the relationships of credit risk, capital risk, and the loan loss provision with financial performance were found to be statistically insignificant. Based on the findings of the study the researcher recommended that commercial banks in Ethiopia adopt a sound and effective management of risks mainly, liquidity risk, interest rate risk, foreign exchange risk, and operational risk to enhance their financial performance ensure sustainable growth, and boost investor confidence. Additionally, it is recommended that the regulatory body address the proper measurement of financial metrics among banks including mainly liquidity ratio, and efficiency ratio to comply with international standards as well as establish rules that will ensure effective disclosure of financial information of banks including, foreign currency-related data.

Key Words: *Risk management, financial performance, commercial banks, liquidity risk, operational risk, market risk, loan loss provision, bank size.*

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List of Acronyms

BCBS	Basel Committee on Banking Supervision
BOD	Board of Directors
BS	Bank Size
CAPM	Capital Asset Pricing Model
CAR	Capital Adequacy Ratio
CBE	Commercial Bank of Ethiopia
CP	Contingency Planning
DBE	Development Bank of Ethiopia
EIU	Economist Intelligent Unit
FOREX	Foreign Exchange Risk
IRR	Interest Rate Risk Ratio
LLP	Loan Loss Provision
LQR	Liquidity Risk
NBE	National Bank of Ethiopia
NPL	Non-Performing Loan
OR	Operational Risk
RM	Risk Management
ROA	Return on Asset

CHAPTER ONE

INTRODUCTION

1.1. Background of the Study

The banking industry in Ethiopia has around 100 years of history. According to Fasil and Merhatbeb (2012), the first bank of Ethiopia named “Bank of Abyssinia” was established in 1905. The bank was formed by the agreement between Ethiopian government and National bank of Egypt with a capital of 1 million shillings. Later on, the Ethiopian Government, under Emperor Haile Sellassie, changed the Bank of Abyssinia to the Bank of Ethiopia and the Bank started its operation in 1932. In 1963, the Bank split into the National Bank of Ethiopia and the Commercial Bank of Ethiopia (Fasil & Merhatbeb, 2012). The intention was to isolate the central Banking function from the Commercial Banking function.

Before the liberalization in 1991, Ethiopia's banking sector was dominated by state-owned banks, with limited private sector involvement. The banking system was characterized by a centralized approach, where the government controlled all financial institutions, leading to inefficiencies and a lack of competition (Menza & Eshete, 2018). The liberalization of the banking sector began in the early 1990s, allowing private banks to operate alongside state-owned institutions. This shift aimed to enhance competition, improve service delivery, and increase financial inclusion. The first private bank, Awash International Bank, was established in 1994, marking a significant milestone in the sector's evolution (Menza & Eshete, 2018). Then several private commercial Banks joined the banking industry at different times.

Currently, the Ethiopian banking sector consists of two state-owned banks, namely the Commercial Bank of Ethiopia (CBE) and the Development Bank of Ethiopia (DBE), and more than 29 private banks. Among these, the majority are conventional commercial banks, and a few of them are Islamic commercial banks (Abate & Kaur, 2023). From the public banks, CBE is the largest bank in Ethiopia, holding over 40% of the market share in terms of assets, branch networks, and resource mobilization. It plays a crucial role in the banking sector, providing a wide range of financial services and dominating the lending market. Consequently, the researcher decided to exclude these state-owned Banks namely (CBE and DBE) in this study rather selected private commercial banks will be considered by taking into account the number of years staying in the

business. This is primarily because the inclusion of data from these banks will overshadow the data from private banks, leading to unrealistic conclusions.

It is evidenced that, the banking sector is a critical component of any economy, acting as an intermediary for financial resources and promoting economic development. Commercial banks, in particular, play a vital role in mobilizing savings, providing credit, and facilitating trade. However, the sector operates in a highly uncertain and dynamic environment, where various risks can significantly affect financial performance Mitku (2015).

Various researchers have proposed different definitions of risk, resulting in challenges in establishing a universal understanding. According to Gallati (2003), risk refers to a situation where there is exposure to adverse conditions or the potential for outcomes that deviate from what is desired. Kannan and Thangavel (2008) add that risk entails exposure to uncertainty or threats. A common theme in these definitions is the acknowledgment that risks can adversely affect profitability. The specific types and levels of risks faced by an organization are influenced by various factors, including its size, complexity, business nature, and activity volume.

Financial risk is a broad term covering various risks related to financing, for instance, credit risk, interest rate risk, foreign exchange risk, capital risk, and so on (Adam Hayes, 2024). Non-financial risks are defined as those that all risks that lead to business operations failure. This type of risk includes operational risks, regulatory risks, strategic risks, reputational risks, information technology risks, fraud risks, business risks, and others (KPMG, 2024).

Therefore, banks must evaluate and either accept or decline it accordingly considering its probability and consequences in daily operations. Effective risk management leads to improved bank performance and is crucial for protecting assets and ensuring the well-being of investors. According to Ishtiaq et al. (2020), the importance of risk management in banks increased significantly after the financial crisis. Recognizing the importance of robust risk management practices, the National Bank of Ethiopia (NBE) has also updated its risk management framework, initially issued in 2003, to reflect the latest developments in the field.

This updated framework attempts to provide basic risk management requirements for banks doing business in the nation and is in line with best practices and international standards. It covers the most prevalent and connected risks that banks encounter, such as market, operational, liquidity,

and credit risks. The guidelines aim to improve the overall safety and soundness of the banking system and encourage risk-based supervision (NBE, 2010).

In light of this, a great deal of research has been done on the variables affecting banks' financial performance. Previous studies examined Ethiopian banks in an effort to determine the factors influencing their financial results. However, previous Ethiopian studies on this subject, such as Biruk(2015) and Yohannes (2021), assessed variables incorrectly. For instance, Biruk(2015) incorrectly measures the liquidity ratio as liquid assets to total deposits instead of the correct regulatory measure, liquid assets to current liability. Similarly, Yohannes (2021) uses liquid assets to total assets, and total capital to total assets to assess liquidity and solvency risk, whereas industry best practices and regulations define these metrics as liquid assets to current liability and total capital to risk-weighted assets. As a result, there is a notable lack of research examining how risk management impacts the financial performance of commercial banks, leading to uncertain conclusions about the relationship between risk management and bank performance. Therefore, this research aims to analyze the effect of risk management on financial performance of commercial banks in Ethiopia.

1.2. Statement of the Problem

Effective risk management is crucial for the sustainable growth and stable financial performance of banks. Banks operate in the dynamic environment which is impacted by the economic, political technological changes in global scale. This financial institution has posed a number of risks including foreign exchange, interest rate, liquidity, credit, operational, and capital related risks.

Therefore, the inability of effectively managing such risks could leads to financial loss, insolvency or systematic crisis that impact broader economic stability (Shabir, 2023). Nowadays, analyzing the financial performance of commercial banks is essential for their profitability and longevity. Additionally, effective risk management is vital within the banking sector, as commercial banks face significant financial risks associated with their operations (Bouteille & Coogan-Pushner, 2012).

Although, the importance of risk management has been broadly studied in developed economies, there is an increasing recognition of its critical role in emerging economies, such as Ethiopia. Globally, risk management has evolved as a cornerstone of financial stability and performance in the banking industry. According to Basel Committee on Banking Supervision guidelines, robust

risk management frameworks are vital to ensure banks can withstand economic shocks and maintain operational continuity (Basel Committee, 2011).

Studies conducted in developed countries, such as the United States and those within the European Union, indicate that banks with strong risk management practices generally achieve better financial performance. This is characterized by higher profitability, lower non-performing loan (NPL) ratios, and increased shareholder value (Van Greuning & Bratanovic, 2020). For instance, the study by Al-Tamimi and Al-Mazrooei (2007) in the Gulf Cooperation Council region shows that effective risk management practices significantly impact financial performance metrics such as return on equity and return on assets.

The NBE's November 2024 Stability Report indicates rising liquidity risks for commercial banks. The NBE depicts ongoing challenges in meeting liquidity requirements and managing asset-liability mismatches, primarily due to a high concentration of deposits and credit among a small number of clients. The report showed that the loan-to-deposit ratio has declined slightly to 60.2 percent, while the ratio of loans and bonds to deposits has increased to 87.9 percent. These figures suggest that most deposits are engaged with borrowers, limiting the banks' ability to handle unexpected withdrawals and potentially leading to liquidity issues. Regulators warn that maintaining the loan-to-deposit ratio below 85% is crucial to prevent liquidity crises (NBE, 2024).

The non-performing loans ratio has risen to 3.9 percent, while still below the NBE 5% limit, some banks have exceeded it. The NBE noted that credit risk is projected to increase in 2024/25 due to armed conflict and global monetary shifts. Effective management of credit risk remains crucial, given that loans and bonds comprise a large part of bank assets (NBE, 2024).

The Ethiopian banking industry is encountering a rising operational risk, with the recent report showed a growth in social engineering, internal threat, and external risks. In 2023/24, fraud and forgeries cost banks Birr 1.3 billion, up from one billion birr the previous year. Most commercial banks reported issues with forgery notes, embezzlement, unauthorized guarantees, and suspicious withdrawals. The NBE warns that risks may grow as banks adopt new technology and forming business relation with third parties (thereporterethiopia, 2024).

Digital risk has also become a serious concern in contemporary banking operations. In March 2024, the CBE experienced a system glitch that led to unauthorized withdrawals and transfer of deposits, resulting in Birr 801.42 million being unauthorially taken. The bank was able to recover Birr 771.39 million, representing 98% of the total amount, through direct refunds and voluntary returns by customers. The incident received widespread media coverage and raised concerns in the digital banking sector (CBE, 2024).

Research by Gidey (2021) conduct how risk management affect Ethiopian banks' performance. Data from seven commercial banks from 2004 to 2015 were subjected to balanced fixed effect panel regression. Analysis was done on four risk management variables. The findings showed that while the capital adequacy ratio has a positive effect on performance, operational risk significantly and negatively affects bank performance. Furthermore, the researcher has identified cost-to-income ratios and liquidity as important factors influencing bank performance in Ethiopia, arguing that raising these metrics could increase profitability. However, the researcher has taken bank size as proxy variable while it should be treated as control variables. Additionally, it appears that the researcher has overlooked some key proxies of risk management, including credit risk, and market risk.

A study conducted by Yohannis (2021), analyzed data from thirteen Ethiopian commercial banks over ten years, from 2010 to 2019, utilizing a mixed research approach that included analysis of documents and unstructured interviews. The findings revealed that credit, liquidity, solvency, and operational risks negatively affected financial performance, while foreign exchange rate risk had a positive influence. The researcher measured variables like, liquidity risk and solvency risk using, liquid asset to total asset, and total capital to total asset respectively. However, the industry best practice and regulatory requirements are total liquid asset to current liability, and total capital to risk-weighted asset, for the aforementioned variables.

Despite the limited number of empirical studies on the effect of risk management on performance of commercial banks, the studies have showed contradictory conclusions. For instance, Biruk (2015) found operational risk has a significant positive statistical relation with financial performance of commercial banks, while Yohannes (2021) found a negative relation between operational risk and financial performance. This could be attributed to differences in observation,

since Biruk (2015) utilized fewer observations (80) for the study and a fixed effect model, whereas Yohannes (2021) used 130 observations and a random effect model.

The gaps in risk management practices and their implications for financial performance underscore the urgent need for research in this area. While studies have explored risk management practices globally, limited attention has been given to the specific challenges and opportunities within the Ethiopian banking sector. This study aims to fill the aforementioned gaps (such as using incorrect measure of variables, selecting regression model without running Hausman test, and reaching at contradictory findings) by using more observations, correct proxy measurements and an appropriate regression model. Thus, by addressing this issue, the research seeks to contribute to the development of more effective risk management frameworks that can enhance the financial stability and sustainability of the sector.

1.3. Objectives of the Study

1.3.1. General Objective

The general objective of the study is to identify the effect of risk management on the financial performances of selected commercial banks in Ethiopia.

1.3.2. Specific Objectives

The study addresses the following specific objectives;

1. To analyze the effect of credit risk management on the return on asset of banks in Ethiopia.
2. To examine the effect of liquidity risk management on return on asset of banks in Ethiopia.
3. To examine how operational risk management influences the return on asset of banks in Ethiopia.
4. To identify the impact of market risks on return on asset of banks in Ethiopia.
5. To analyze the effect of capital risk management on return on asset of banks in Ethiopia.
6. To analyze how loan loss provision, affect the return on asset of banks in Ethiopia.
7. To analyze how bank size, affect the return on asset of banks in Ethiopia.

1.4. Hypotheses of the Study (HP)

The alternative hypotheses were put out for examination by the overall objectives of this research.

H1: Credit risk has a significant and negative effect on return on asset of commercial banks in Ethiopia.

H2: Liquidity risk has a significant and negative impact on return on asset of commercial banks in Ethiopia.

H3: Operational risk has a significant and negative impact on return on asset of commercial banks in Ethiopia.

H4: Interest rate risk has a significant negative effect on return on asset of commercial banks in Ethiopia.

H5: Foreign exchange rate risk has a significant positive effect on the return on asset of commercial banks in Ethiopia.

H6: Capital risk has a significant negative effect on the return on asset of commercial banks in Ethiopia.

H7: Loan loss provision has a significant effect on return on asset of commercial banks in Ethiopia.

H8: Bank size has a significant positive effect on return on asset of commercial banks in Ethiopia.

1.5. Significance of the Study

The study's finding will assist Ethiopian commercial banks in assessing their risk management and enhancing profitability by comprehending how it affects their operations. The study gives policymakers information that can help them create rules and guidelines that will improve the stability and efficiency of the banking industry by managing risk effectively. The research findings can be used by stakeholders and investors to make well-informed investment choices by comprehending how banking risks impact profitability. The study also acts as a guide for upcoming researchers, providing a starting point for additional investigation into banking performance and risk management in Ethiopia and similar context.

1.6. Scope of the Study

This paper was confined to identifying and examining the effect of risk management on the financial performance of private commercial banks in Ethiopia by considering eight independent variables namely: credit risk, liquidity risk, operational risk, interest rate risk, foreign exchange

risk, capital risk, loan loss provision, and bank size. These variables capture the key dimensions of risk that are most pertinent to the Ethiopian banking sector, as supported by the Basel regulatory frameworks, empirical literature, and the National Bank of Ethiopia's Financial Stability Report NBE (November 2024).

To ensure the reliability and relevance of the findings, the study covers eight-year period (2017 to 2024) and includes 16 private commercial banks that have been operational for over eight years. The selection of this timeframe is due to the limited availability of 8-year financial data for most banks in the industry and for a years before 2017 some banks did not adequately report some of the ratio indicators. However, the chosen banks have been in operation for more than eight years and possess the necessary data required for a comprehensive analysis.

1.7. Limitations of the Study

The study is limited to assessing the effect of risk management on the financial performance of 16 private commercial banks from the fiscal year 2017/18 to 2023/24. This was mainly due to the lack of available information from the banks as well as from the NBE for the year before 2017. For instance, off-balance sheet exposures, liquidity ratio, non-performing loans, and interest rate risk related data had not been availed in financial statement that limits the researchers work.

1.8. Organization of the Study

This research paper consisted of five chapters. In chapter one, the background of the study, statement of the problem, research questions, research objectives, significance of the study, scope, and limitations of the study was included. In chapter two literature related to theoretical framework, empirical evidence and conceptual framework about the topic was reviewed in detail. Chapter three, the methodology part was discussed including sampling methods, sources of data and data collection tools, and data analysis methods. In chapter four the data analysis and interpretation and findings of the study was discussed. Finally, in chapter five, the summary, conclusion, recommendations, and future research direction was presented.

CHAPTER TWO

2. LITERATURE REVIEW

This chapter provides a theoretical overview of the study, focusing on the primary theories related to risk management. It highlights the main risks faced by commercial banks and includes an empirical review along with the categories of risk management activities. Furthermore, the various types of risks encountered by banks will be discussed. Furthermore, it explains how this research aims to address existing knowledge gaps and outlines the approaches the research paper will take to fill these gaps.

2.1. Theoretical Literature Review

This study refers various risk management theories including; Financial Economic Theory, Stakeholder Theory, New Institutional Economics Theory, and Enterprise Risk Management Theory, as it seeks to determine the relationship between risk management practices and the financial performance of commercial banks in Ethiopia.

2.1.1. Risk Management Theories

Risk identification, risk assessment, and risk prioritization are the three main parts of the risk management paradigm. Subsequently, resources are applied in a coordinated and cost-effective manner to maximize opportunities and reduce, monitor, and regulate the likelihood and/or impact of adverse events (Wenk, 2005). Transferring the risk to a third party, avoiding the danger completely, lowering the risk's possibility or adverse effects, or accepting some or all of the possible or actual consequences of a given risk are common risk management techniques.

Dorfman (2007) asserts that creating a clear strategy and implementing these tactics across the entire firm are crucial to ensuring that risk management is used in a cost-effective manner. Financial, operational, governance, and strategic risk management are just a few of the risk management approaches that are covered by these techniques. According to the State Bank of Pakistan's (2003) risk management guidelines for commercial banks, risk management operations take place at various levels of hierarchy. The following tiers of risk management in financial organizations are identified by it:

1. Strategic Level: At this level, risk management functions are performed by senior management and the Board of Directors (BOD). This includes defining risks, establishing the institution's risk appetite, formulating strategies and policies for managing risks, and ensuring that adequate systems and controls are in place to keep overall risk within acceptable levels while ensuring that rewards compensate for the risks taken.
2. Macro Level: This level incorporates risk management across business areas or lines, involving all risk-related activities performed by middle management or units dedicated to conducting risk reviews.
3. Micro Level: This involves “on-the-line” risk management, where risks are created. At this level, risk management is confined to adhering to operational procedures and guidelines established by management.

2.1.1.1. Agency Theory

The design of contracts to meet agency issues and the related expenses that result from giving agents decision-making authority is covered by agency theory. It is a part of organizational theory, game theory, and positive accounting theory. According to Watts and Zimmerman (1986), positive accounting theory seeks to explain which accounting practices businesses are most likely to use or refrain from using.

This theory emphasizes the connection between agents, such as bank managers, and principals, or shareholders, and how crucial it is to match their interests. Conflicts of interest can occur when managers put short-term financial gain ahead of long-term stability, which could lead to subpar risk management (Jensen & Meckling, 1976). Effective risk management systems must be put in place in order to lessen these conflicts, promote transparency, and improve financial outcomes.

2.1.1.2. Modern Portfolio Theory

The Capital Asset Pricing Model (CAPM) was developed in the 1960s by financial theorists William Sharpe, John Lintner, Jack Treynor, and Jan Mossin. It links investment returns to the risks they entail. Investors can calculate the projected return on equity based on asset prices thanks to this model, which provides an idealized picture of how financial markets value securities. It also suggests that greater gains usually come with a greater risk tolerance.

MPT, initially proposed by Harry in 1952, underlines the significance of diversification in managing investment risk. MPT advocates that a well-diversified loan portfolio can mitigate credit risk and improve financial outcomes. However, Ethiopian banks encounter difficulties in applying MPT due to limited opportunities for diversification, as their loan portfolios are often heavily focused on sectors like agriculture and manufacturing (Gebeyehu, 2021).

2.1.1.3. Contingency Planning Theory

Contingency planning (CP), sometimes referred to as business continuity planning, is an essential part of risk management, claim Hinson and Kowalski (2008). The fundamental tenet of CP is that since it is impossible to completely eradicate all hazards, some residual risks will always exist. Moreover, contingency theory states that there is no one-size-fits-all approach to risk management; instead, strategies should be tailored to the specific circumstance, taking into consideration the external environment, internal capabilities, and organizational structure (Donaldson, 2001). Given Ethiopian banks' distinct operating environment, which is characterized by regulatory restrictions and macroeconomic instability, this theory is particularly pertinent to them.

2.1.2. Definition of Risk

In many economic articles, risk is often viewed as a negative deviation from expected outcomes (Maylor, 2010). According to Ghosh (2015), risk in banking refers to the potential for loss caused by adverse events such as economic downturns, unfavorable changes in fiscal and trade policies, fluctuations in interest or exchange rates, or falling equity prices.

A risk is essentially an activity that may yield profits or result in losses, characterized by the uncertainty associated with future trading activities. In other terms, risk can be understood as the uncertainty surrounding potential earnings outcomes (Vasavada, Kumar, Rao & Pai, 2005). Risks can be articulated as uncertainties that lead to adverse results, especially concerning planned objectives or expectations (Kumar et al., 2005). Simply put, risk can be described as the possibility of incurring a loss, whether financial or reputational (Sharma, 2003).

The concept of uncertainty arises when a decision-maker is aware of all potential outcomes but lacks insight into the probabilities of those outcomes. In contrast, risk is associated with scenarios where the decision-maker knows the probabilities of various outcomes (Sharma, 2003). Osborne (2012) notes that risks may emerge from a business's activities or from external influences such as legislation, market dynamics, fluctuations in interest or exchange rates, the actions of others, or

even environmental factors like weather. These risks can stem from the business environment, natural surroundings, political or economic factors, or human errors and shortcomings.

The nature and impact of risks can vary between organizations, even among those within the same industry, as these differences can stem from factors such as size, task complexity, types of products or services offered, or organizational structure. Consequently, the risks faced by businesses are often inherent to their operations.

Regarding risk classification, Jorion and Khouury (1996), as cited by Khan and Ahmed (2001), suggest that risks can be divided in various ways. One common approach is to differentiate between business risk and financial risk. Business risk is associated with the intrinsic characteristics of a firm's operations and is influenced by market factors related to its products. Financial risk, on the other hand, arises from potential losses in financial markets due to changes in financial variables (Jorion and Khouury, 1996), often related to leverage and the risk of failing to meet obligations with current assets (Gleason, 2000).

2.1.3. Types of Risk in the Banking Sector

According to Raymond (2012), financial risk management is the quality control of finance. It is a broad term used for different senses for different businesses or things but basically, it involves identification, analyzing, and taking measures to reduce or eliminate the exposure to loss by an organization or individual.

The task of keeping an eye on financial hazards and controlling their effects is known as financial risk management. It is an application of contemporary financial theory and practice and a subfield of risk management (Moles, 2016). Banking is the process of acting as a middleman between people who want to save money and enterprises that need money. Banks assume a variety of risks, both financial and non-financial, in the course of offering financial services. Furthermore, the degree of risk involved in their services differs based on the particular good or service provided (Adarkwa, 2011).

To provide frameworks for their examination, different authors have classified these risks in various ways. Credit risk, market risk, liquidity risk, operational risk, business risk, legal risk, reputation risk, and strategic risk are among the categories of banking risks presented by Crouhy et al. (2006).

2.1.3.1. Credit Risk

Credit risk, according to Basel (2000), is the possibility that a bank borrower or counterparty would not fulfill their end of the agreement. The primary goal of credit risk management is to maximize a bank's risk-adjusted return by keeping credit risk exposure within acceptable ranges. Banks must manage the credit risk associated with their entire portfolio in addition to the risk associated with specific credits or transactions. Banks should also consider the relationships between credit risk and other risk categories. The long-term success of any banking institution is contingent upon its capacity to efficiently handle credit risk, which is an essential part of a comprehensive risk management strategy.

Hempel and Simonson (1999) describe credit risk as the potential for losses arising from a decline in the credit quality of borrowers or counterparties. In a bank's portfolio, these losses can be caused by the external default of customers unwilling or unable to fulfill their obligations. Additionally, losses may occur from a decrease in the overall portfolio value resulting from actual or perceived declines in credit quality.

According to Greuning and Bratanovic (2009), credit risk is the possibility that a debtor or issuer of a financial instrument whether a person, company, or nation will not be able to pay back the principal and related cash flows as specified in a credit arrangement. There are two types of credit risk: "firm-specific" and "systematic." While systematic credit risk is concerned with default due to more general economic or macroeconomic issues that affect all borrowers, firm-specific credit risk is concerned with the default probability of a borrowing firm associated with the particular project types that the bank undertakes (Saunders and Cornett, 2006). For banks, this risk is especially noticeable during recessions when borrowers find it difficult to fulfill their lending commitments.

The goal of credit risk management is to optimize a bank's risk-adjusted return while keeping credit risk exposure within acceptable limits. According to various studies, credit risk accounts for more than half of a bank's balance sheet, making it a primary contributor to potential losses and banking failures. In the marketplace, a decline in a borrower's credit standing can lead to actual losses, as it typically results in an increase in the required market yield to offset the higher risk, which in turn causes a drop in value (Bessis, 2010).

Banks closely evaluate the financial condition of borrowers and the current value of any underlying collateral when assessing the credit risks associated with obligors or counterparties (Santomero, 1997). Greuning and Bratanovic (2009) highlight that formal policies established by a bank's board of directors and executed by management are crucial for effective credit risk management. A bank typically utilizes a credit or lending policy to define the extent and allocation of its credit facilities, as well as the management of its credit portfolio, including how investment and financing assets are originated, assessed, supervised, and collected.

2.1.3.2. Operational Risk

The New Basel Accord characterizes operational risk as the possibility of direct or indirect financial loss arising from insufficient or failed internal processes, people, systems, or external factors. This risk reflects potential financial setbacks linked to disruptions in everyday operational functions. It can occur due to non-compliance with established policies, regulations, or laws, as well as incidents of fraud or forgery (Njogo, 2012).

Operational risks can manifest from both internal shortcomings and external events, and to address these risks, organizations often rely on robust internal control and audit systems. Failures may arise from issues such as malfunctioning information and reporting systems, ineffective internal monitoring procedures, or non-compliance with internal risk policies, leading to operational risks (Bessis, 2010). These risks can present themselves at various levels, including human errors, procedural flaws, and technology-related issues. Given that operational risk is an event-driven concern, a lack of effective risk tracking and reporting measures might result in crucial risks being overlooked, inhibiting timely corrective actions, and potentially leading to severe consequences. The evolving landscape of modern banking, characterized by increased reliance on advanced technology, the expansion of retail operations, the growth of e-commerce, the outsourcing of various functions, and a greater reliance on structured financial instruments, has contributed to rising levels of operational risk within banks (Greuning and Bratanovic, 2009).

Recognizing these factors has led to a heightened focus on developing effective operational risk management systems in banks, largely driven by the Basel Committee on Banking Supervision. This committee emphasized operational risk in its Core Principles for Effective Banking Supervision (1997), stipulating that supervisors must ensure banks maintain risk management policies and processes to identify, assess, monitor, and mitigate operational risk. In its 2003

guidelines, Sound Practices for the Management and Supervision of Operational Risk, the committee offered further advice to banks on managing operational risk as part of the preparation for Basel II, which necessitated a capital allocation for such risks.

However, despite these regulatory efforts, practical challenges remain in managing operational risk. Establishing universally applicable causes or risk factors to create standardized management tools and systems proves difficult, as these events are highly specific to individual banks. In addition, estimating potential losses from specific risk factors can be complex. Lastly, designing an effective approach for systematically reporting trends in a bank's operational risks is challenging due to the infrequency of significant operational losses.

To navigate these data and methodological obstacles, the initial step in creating an effective management framework is to establish a common classification for loss events, which would aid in gathering data on event frequency and associated costs. The collected data can then undergo risk mapping using various statistical techniques, including graphical representations of the probability and severity of risks. This analysis allows for the identification of relationships among different operational risks. Ultimately, this process aids in estimating potential maximum losses related to these event risks. Properly modeling loss distributions related to operational risks will enable banks to accurately allocate capital as mandated by current regulations (Bessis, 2010).

2.1.3.3. Liquidity Risk

According to the Basel Committee on Banking Supervision (2008), liquidity refers to a bank's capacity to finance the growth of its assets and fulfill its obligations as they arise, all while avoiding unacceptable losses. Banks play a crucial role in transforming short-term deposits into long-term loans, which makes them naturally susceptible to liquidity risk both from individual institutions and broader market influences. Almost every financial transaction or commitment can impact a bank's liquidity. Managing liquidity risk is critically important, as a liquidity shortfall at one institution can lead to widespread repercussions across the financial system. Recent developments in financial markets over the past decade have further complicated the landscape of liquidity risk and its management.

According to Gup and Kolari (2005), liquidity risk refers to the potential threat to earnings or capital arising from a bank's capacity to fulfill its obligations to depositors and respond to borrowers' needs. This entails the ability to swiftly convert assets into cash with minimal loss,

access necessary funds when required, and maintain sufficient liquidity for profitable securities trading activities. Liquidity risk is a critical concern for a bank's portfolio, as it can lead to bankruptcy in severe cases. The Basel Committee on Bank Supervision, in its June 2008 consultative paper, described liquidity as a bank's ability to finance asset increases and meet obligations as they become due, without suffering unacceptable losses.

Bessis (2010) examines liquidity risk from three distinct perspectives. The first perspective addresses cases where a bank struggles to raise funds at a reasonable cost. This can occur due to factors such as transaction volumes, fluctuations in interest rates, and challenges associated with funding counterparties. The second perspective views liquidity as a safety cushion that allows banks to buy time during difficult situations. In this context, liquidity risk is defined as a scenario in which the values of short-term assets are inadequate to cover short-term liabilities or unexpected outflows. The final perspective considers liquidity risk in extreme situations, such as significant losses that lead to liquidity problems and uncertainty about the bank's future.

2.1.3.4. Market Risk

Saunders and Cornett (2006) define market risk as the potential loss to a bank caused by changes in market variables. It refers to the risk that fluctuations in equity and interest rate markets, currency exchange rates, and commodity prices will negatively impact the value of both on-balance and off-balance sheet positions. Market risk affects a bank's earnings and capital due to shifts in interest rates or the prices of securities, foreign exchange, and equities, as well as the volatility of these prices. Effective market risk management provides a comprehensive framework for measuring, monitoring, and managing risks related to interest rates, foreign exchange, equities, and commodity prices. This management must be closely integrated with the bank's overall business strategy. The main types of market risk include interest rate risk and foreign exchange risk.

I. Interest Rate Risk

Interest rate risk refers to the potential negative impact on a financial institution's net interest income due to fluctuations in interest rates. Changes in these rates can affect earnings, the value of assets, liabilities, off-balance-sheet items, and cash flow. From an earnings perspective, it is important to analyze how changes in interest rates impact accrual or reported earnings in the short

term. This is quantified by assessing changes in Net Interest Income (NII), which is the variation between total interest income and total interest expense, as noted by Gleason (2000).

Adarkwa (2011) explains that interest rate risk management involves a variety of policies, actions, and techniques that banks employ to mitigate the risk of a decline in net equity caused by adverse interest rate movements.

Risk factors associated with interest rate risk are estimated for each currency in which a bank has interest-rate-sensitive on- and off-balance-sheet positions. Since interest rate risk can adversely affect both a bank's earnings and its economic value, an effective approach combines an assessment of how interest rate changes impact net interest income with a broader examination of the long-term effects of these changes on the bank's economic value (Adarkwa, 2011).

II. Foreign Exchange Risk

The number of units of one currency that can be purchased or exchanged for one unit of another is indicated by exchange rates. The forward rate is applicable to agreements made today with the actual currency exchange taking place at a later time, whereas the spot rate is the exchange price for transactions that are completed immediately. The rate decided upon today will be used for the exchange at this later date.

Foreign currency risk, according to Bessis (2011), is the potential for losses due to fluctuations in exchange rates. This risk could originate from either transaction risk or economic risk. Transaction risk arises from changes in nominal exchange rates that affect a company's contractual cash flows in foreign currencies, particularly when contracts have been negotiated but not yet settled. Transaction risk is present for companies that employ foreign currency-denominated derivatives, borrow or invest in foreign currencies, or import or export goods with deferred payment (Collier, 2009). Due to exchange rate volatility, banks that have assets or commitments in other currencies are subject to foreign exchange risk, which can affect their capital and revenues (Sabri, 2011).

The earnings and capital of commercial banks are at risk due to the uncertainty created by exchange rates, which can fluctuate either upward or downward at any time. There are two types of direct foreign exchange risk: transactional and translational. While translational risk is an accounting risk that results from changing the value of assets held in other currencies, transactional risk is linked to transactions carried out in foreign currencies. Conversely, economic exposure is the source of

indirect exchange rate risk, which is represented in the demand for and performance of bank loans. Additionally, as Sabri (2011) points out, commercial banks' exposure to foreign exchange risk stems from both their trade and non-trade activities.

2.1.3.5. Capital Risk

The banking sector plays a crucial role in any economy by acting as an intermediary for financial resources and fostering economic development. Commercial banks are particularly important as they mobilize savings, provide credit, and facilitate trade. However, this sector operates in an uncertain and dynamic environment, where various risks such as credit risk, market risk, operational risk, capital, and liquidity risk can greatly impact financial performance (Ghosh, 2015). For commercial banks, managing these risks effectively is not just a regulatory requirement; it's also a strategic necessity to maintain stability and profitability (Basel Committee on Banking Supervision, 2019).

In the realm of commercial banking, capital risk occurs when a bank's capital reserves are not enough to cover losses from unexpected adverse events or decreases in asset values (Hull, 2018). If these reserves are inadequate, the bank could face solvency issues, potentially leading to bankruptcy or the need for external support, such as government bailouts. To address these risks, regulations like the Basel Accords have been implemented to establish minimum capital requirements for banks (Basel Committee on Banking Supervision, 2011). These regulations are designed to strengthen the resilience and stability of the financial system by ensuring that banks hold sufficient capital relative to their risk exposures.

2.1.3.6. Reputational Risk

Reputation is often referred to as the “Emotional Capital/ Equity” of a firm and as capital, it is subjected to risk. According to Atkins, Drennan, the Bates (2006) a significant part of many successful companies' share price is not made up of tangible assets such as property and reserves but from the goodwill element. Hence, a company's reputation includes various intangibles such as the potential future profit stream and the value of its brand. These intangibles may be several times the value of tangible assets in companies with good reputations. Conversely, a company with a poor reputation can have negative reputation equity where the company is valued at less than the value of its tangible assets.

In a paper by the Economist Intelligent Unit (EIU), 2005 reputation risk is seen as becoming one of the emerging and increasingly important classes of risk on the priority list of most managers. With an index score of 52, reputational risk is perceived as substantially more significant than regulatory, human Capital, IT, market, and credit risks.

According to Basel (2009), reputational risk is defined as the possibility of financial losses stemming from negative perceptions held by various stakeholders, including customers, depositors, counterparties, market analysts, investors, shareholders, regulators, and others.

2.1.3.7. Strategic Risk

Crouhy et al. (2006) describe strategic risk as the uncertainty surrounding significant investments, which can lead to questions about their success and profitability. For instance, when competition intensifies, a bank might begin offering loans to subprime customers with questionable credit histories. Additionally, a sudden spike in interest rates can quickly decrease mortgage volumes for banks.

Slywotzky and Drzik (2005) identified several critical events contributing to strategic risk and grouped them into seven categories. These categories include industry margin contractions, technological disruptions that could make certain products or services irrelevant, brand deterioration, the rise of unique competitors capturing significant market share, changes in customer priorities, project failures, and stagnation in market growth. Their goal was to provide a structured way to evaluate a company's strategic risks and formulate measures to mitigate them. They assert that effectively managing strategic risks requires a thorough understanding of how to assess and respond to these challenges, thus necessitating the allocation of resources toward this effort.

2.1.4. Risk Management in Banking

Kanchu and Kumar (2013) describe risk management as a proactive approach that entails planning, leading, organizing, and controlling a variety of risks that can impact both day-to-day operations and long-term objectives of an organization. Similarly, Rejda and McNamara (2017) characterize risk management as a systematic method for identifying and assessing potential loss exposures encountered by businesses or individuals, along with selecting and applying the most effective

strategies to address these exposures. This process encompasses the identification, evaluation, and management of risks.

To ensure that banks maintain a robust risk management environment with minimal uncertainty and potential losses, managers need reliable metrics to inform capital allocation decisions towards endeavors that offer the best risk-to-reward balance. They must also have estimates of potential loss magnitudes to remain within boundaries set by careful internal assessments and regulatory standards. Additionally, it's essential to have monitoring mechanisms in place and to foster incentives for responsible risk-taking among teams and individuals.

Risk management evolved from a strictly banking activity, related to the quality of loans, to a very complex set of procedures and instruments in the modern financial environment. It underscores the fact that the survival of an organization depends heavily on its capabilities to anticipate and prepare for the change rather than just waiting for the change and reacting to it (Fikadu, 2021).

Risk Management (RM) involves a series of activities designed to minimize the negative consequences (costs) associated with uncertainty (risk) and potential losses (Schmidt and Roth, 1990). Redja (1998) defines it as a systematic approach to identifying and evaluating pure loss exposure faced by individuals or organizations. This process entails selecting and implementing the most effective strategies for managing these exposures, including the identification, evaluation, and governance of risks.

Bessis (2010) notes that risk management is not only a process but also encompasses a variety of tools and models for assessing and controlling risk. The main goals of risk management include minimizing foreign exchange losses, reducing cash flow volatility, protecting against earnings fluctuations, enhancing profitability, and ensuring the firm's viability (Fatemi and Glaum, 2000). Other researchers argue that risk management involves consciously accepting risks with a clear understanding and purpose, allowing for effective analysis and mitigation to prevent unacceptable losses that could jeopardize the firm's competitive position.

For banks to function within a robust risk management framework while reducing uncertainty and potential losses, managers need reliable risk metrics. These metrics guide the allocation of capital to opportunities with the most favorable risk/reward profiles. Management must have estimates of potential losses to operate within limits that are determined by careful internal evaluations and

regulatory standards. Additionally, they must implement monitoring mechanisms and create incentives for responsible risk-taking among divisions and individuals. According to Pyle (1997), risk management is the approach managers use to meet these needs by identifying key risks, obtaining consistent and comprehensible operational risk measures, determining which risks to mitigate or accept, and establishing procedures to oversee the resulting risk positions.

2.1.4.1. The Rationale for Risk Management in Banking

The main aim of risk management in banks is to maximize expected profits taking into account its variability/volatility (risk). This calls for an active management of the risk to get the desired results. Risk management is therefore an attempt to reduce the volatility of profit, which has the potential of lowering the value of shareholders' wealth. Various authors including Smith et al (1990) and Froot et al (1993), have offered reasons why managers should concern themselves with the active management of risks in their organizations.

The primary goals of risk management include minimizing losses from foreign exchange, reducing cash flow fluctuations, safeguarding against variations in earnings, enhancing profitability, and ensuring the longevity of the firm (Fatemi & Glaum, 2000). Another group of researchers argues that effective risk management requires a deliberate approach to taking risks, grounded in awareness, purpose, and understanding, enabling accurate evaluation and management of these risks to prevent significant losses that could threaten a firm's success or competitive edge.

The prudent bank avoids losses but it might suffer from lower market share and lower revenues. However, after a while, the risk taker might find out that higher losses materialize, and obtain an ex-post performance lower than the prudent lender performance (Bessis, 2002).

Banking institutions that actively manage their risks have a competitive advantage. They take risks more consciously, anticipate adverse changes, protect themselves from unexpected events, and gain the expertise needed to price risks effectively. Competitors that lack these abilities may experience short-term gains but will ultimately lose ground when risks materialize into losses (Ayalew, 2014).

According to Oldfield and Santomero (1995), a recent literature review identifies four main rationales for risk management. First, managers often seek to protect their positions and wealth within the firm. Because they have limited ability to diversify their investments, these managers

tend to be risk-averse and prefer stable earnings over volatile ones, as stability enhances their utility. Second, the demand to decrease the tax obligation further initiates managers to seek lower volatility in profits through risk management. A progressive tax schedule indicates that a smoother income leads to a lower expected tax obligation, prompting activities aimed at reducing the volatility of reported taxable income and thereby enhancing shareholder value.

Bessis (2010) suggests that the goal of risk management is to measure risks to monitor and control them. Additionally, it serves other crucial functions within a bank beyond direct financial performance. These include assisting in the implementation of the bank's overall strategy by providing insights into future conditions, defining appropriate business policies, and developing competitive advantages through accurate pricing and differentiated strategies based on customer profiles.

According to Santomero (1995), the management of a banking firm relies on a sequence of steps to implement a risk management system. This process typically comprises four components: standards and reports, position limits or rules, investment guidelines or strategies, and incentive contracts or compensation. These tools are designed to measure exposure, establish procedures for managing these exposures, limit individual positions to acceptable levels, and encourage decision-makers to manage risk in alignment with the firm's goals and objectives.

2.2. Empirical Review

2.2.1. Related Empirical Studies Abroad

The study by Wood, A. (2018) looks at the impact of risk management on the financial performance of Barbados' commercial banks from 2000 to 2015. The researcher found that capital risk, credit risk, liquidity risk, interest rate risk, and operational risk all significantly affect financial performance, while nation risk has no effect at all, according to quarterly data. Notably, credit risk negatively impacts financial performance, thus organizations need to implement effective protections against it. However, higher capital has a positive effect on profitability. The importance of liquidity management and the need for banks to monitor the impact of macroeconomic developments on their bottom line are both emphasized in the study. It was found that there was very little correlation between GDP growth and financial performance.

Nonetheless, Jessie I. Chukwunulu's (2019) study looked at how risk management affected Nigerian banks' profitability using two important metrics: ROE and ROA. Findings showed that credit risk had a little detrimental effect on ROA but a considerable negative impact on ROE. Operational risk and liquidity management have no discernible impact on performance. On the other hand, capital sufficiency had a negative and negligible influence on ROA but a favorable impact on ROE. In order to improve bank performance and avert financial crises, the Central Bank of Nigeria (CBN) and other authorities should implement better risk management methods, according to the study's conclusion that risk management techniques in Nigerian banks are deficient.

2.2.2. Related Empirical Studies in Ethiopia

Tade S. (2017), analyzed the impact of credit risk management on the performance of six private commercial banks in Ethiopia from 2000 to 2013. The study reveals that, measures such as capital adequacy ratio, total loan ratio, non-performing ratio, bank size, and liquidity ratio significantly impacted their ROA and ROE. Likewise, Getahun (2015), using a six-year panel data period from 2009 to 2014 was used to examine the relationship between credit risk and performance. The findings reveal a strong relationship between credit risk management and commercial bank performance in Ethiopia, highlighting the importance of effective risk management in financial institutions.

Birhan, T. (2025) analyzed bank risk in the Ethiopian banking sector from 2010-2011 and 2021-2022. Findings showed that bank size inversely correlated with risk, while human capital efficiency and loan-to-deposit ratio significantly affected risk. Bank loan growth increased risk. The study suggests efficient risk management strategies, enhanced regulatory frameworks, and effective macroprudential policies for bank stability.

Benti, T. (2021), examine the effect of liquidity risk on Ethiopian commercial banks' financial performance. The findings indicate that the banks' financial performance is significantly impacted by GDP, leverage (TLA), and liquidity (LATA). The financial performance of central banks is not significantly impacted by the Funding Gap Index (FGR), Cash Reserve Ratio (CRR), or Bank Size (SIZE). The report suggests evaluating credit rating systems, educating and advising borrowers on financial matters, maintaining adequate capital, and enhancing bankers' capacity building.

Kassahun (2022), examines the impact of market risk on Ethiopian commercial banks from 2012 to 2021 using a regression model. It identifies ROE as a financial performance indicator and net interest margin and foreign exchange exposure as market risk management indicators. The results suggest a potential gap in literature.

Yohannis Fikadu (2021) looks into the connection between Ethiopian commercial banks' financial performance and risk management. The researcher established a number of risk management proxies, including credit risk, liquidity risk, solvency risk, operational risk, interest rate risk, and foreign exchange rate risk, and used return on assets as a gauge of financial performance. The study uses a mixed-methods approach that combines unstructured interviews and documentary review to examine 18 commercial banks in Ethiopia over a ten-year period, from 2010 to 2019. The study's findings show that while foreign exchange rate risk has a favorable impact on financial performance, credit risk, liquidity risk, solvency risk, and operational risk all have a negative and significant impact. The results underline the importance of effective risk management practices for improving the financial health of Ethiopian commercial banks, emphasizing the need for a balanced approach to managing different types of risk to enhance profitability and ensure bank stability.

However, the study conducted by Biruk Shimelis (2015) finds that credit risk and liquidity risk management practices negatively impact bank performance, while capital and insolvency risk have insignificant effects. In contrast, operational risk management practices positively influence performance, particularly in terms of efficiency and cost management. The study emphasizes the need for robust risk management practices across all risk categories to safeguard investor interests and maintain a healthy financial system in Ethiopia.

Additionally, credit risk, liquidity risk, operational risk, and market risk all severely deteriorate Ethiopian commercial banks' financial performance, according to Tassew and Hailu's (2019) study on risk management and financial performance. On the other hand, banks' financial performance is positively impacted by their size. The study came to the conclusion that the financial performance of commercial banks is greatly impacted by credit, liquidity, operational, and market risks. In order to sustain their financial success, the researchers advised Ethiopian commercial banks to concentrate on efficiently managing their loan portfolios and reducing market risks.

Mitku (2015) assessed the effect of risk management on the operations of banks in Ethiopian. Data from eight commercial banks between 2002 and 2013 were used in the study, which employed a

balanced fixed effect panel regression analysis. Four types of risk were shown to have an impact on banks' performance. The results of the panel data regression demonstrated that the credit risk indicator (NPLR), liquidity risk indicator (LIQR), and operational risk indicator (CIR) all had a negative and statistically significant impact on bank performance. This study attempts to close the gaps in the current body of knowledge by focusing on the risk management practices of Ethiopian commercial banks and connecting them to their financial performance. Based on the results, the researcher suggests that Ethiopian commercial banks enhance the caliber of their loans, make efficient use of money from fixed deposits, and control non-interest costs including payroll and administrative expenditures.

Lemaa Belay (2021) looks at how controlling credit risk, operational risk, liquidity risk, and market risk affects the financial performance of Ethiopia's banking industry as indicated by return on equity and return on assets. Data from 17 Ethiopian commercial banks spanning five years was examined in the study. According to the regression results, return on equity (ROE) and return on assets (ROA) are both highly impacted by the non-performing loan ratio and the loan loss provision ratio, which are indicators of credit risk management.

However, only when financial performance was evaluated using ROA did the capital adequacy ratio become significant. Furthermore, there was no discernible impact of the inflation rate, exchange rate, or loan-to-deposit ratio on Ethiopian commercial banks.

Gidey Yifer (2021) uses balanced fixed-effects panel regression analysis on data from seven banks to investigate how risk management affected Ethiopian commercial banks' performance between 2004 and 2015. Important conclusions show that while the Capital Adequacy Ratio has a favorable impact on bank performance, the operational risk indicator, which is represented by the Cost-Income Ratio (CIR), has a negative impact. The cost-to-income ratio and liquidity ratio are also highlighted in the report as important factors influencing bank performance. Effective risk management practices reduce risks and increase returns on assets, according to the study's findings, which implies that raising these variables could improve Ethiopia's commercial banks' overall performance and profitability.

2.2.3. Empirical Evidence on Independent Variables and Profitability

Credit Risk

H1: Credit risk has a significant and negative effect on return on asset of commercial banks in Ethiopia.

A bank's cash flow and profitability may be impacted by credit risk, which is a natural part of banking and includes the potential for late or nonexistent payments (Greuning and Bratanovic, 2009). In this study, credit risk was represented by the Non-Performing Loan (NPL) ratio. NPLs are defined by the NBE as advances or loans whose credit quality has declined to the extent that it is uncertain whether principal and/or interest will be fully collected in line with the terms of the contract (Directive No. SBB/43/2008).

The highest percentage of non-performing loans that NBE allows is 5%; if this threshold is surpassed, it will affect the bank's soundness level assessment and reduce its value. A bank's ability to manage credit is correlated with its Non-Performing Loan (NPL) ratio (Gayatri et al., 2019). A negative correlation between credit risk and financial performance is demonstrated by Endawek (2015) and Biruk (2015).

Liquidity Risk

H2: Liquidity risk has a significant and negative impact on return on asset of commercial banks in Ethiopia.

The ratio of cash and cash equivalent items to short term customer deposit, and other short-term borrowing, or the ratio of total liquid asset to short term customer deposit (current liability) is used to quantify liquidity risk. According to the NBE commercial banks must maintain a minimum requirement of 15% of liquidity ratio. The liquidity risk has significant negative relation with financial performance (Abel, 2019; Enyew 2013).

Operational Risk

H3: Operational risk has a significant and negative impact on return on asset of commercial banks in Ethiopia.

Operating expense to operating income ratio shows the overhead cost of running the banks, such as employee wages and benefit, occupancy charges and other expenses like office supplies, are displayed as percentage of income. It serves as a gauge of management's cost controlling ability

and it is anticipated to have a negative correlation with earnings because better cost control will boost productivity and, consequently, profits. It is also one of the main factors influencing profitability that is looked at. Like Pasiouras & Kosmidou (2007), Trujillo-Ponce (2012), and others, banks' operational efficiency is measured using the cost-to-income ratio. In respect to the findings from Abel (2019), Yohannes (2021), and Endawek (2015), operational risk has a significant negative relation with financial performance. While, Biruk (2015) reached on conclusion regarding the positive relation between operational risk and financial performance.

Interest Rate Risk

H4: Interest rate risk has a significant negative effect on return on asset of commercial banks in Ethiopia.

The core of the lend-long and borrow-short thesis is that profitability and the real interest rate should be positively correlated Vong and Hoi Si Chan (2008). Changes in interest rates give rise to interest rate risk. When there is an imbalance in the size or maturity dates of a bank's interest rate-sensitive assets and liabilities, the bank is exposed to interest rate risk. When interest rates rise or fall, the bank may suffer losses, which some refer to as a "risk gap" because it affects the budget's net asset value Cicea & Hincu (2009). In line with the findings of Abel (2019), there exist a negative relation between interest rate risk and financial performance of commercial banks.

Foreign Exchange Rate Risk

H5: Foreign exchange rate risk has a significant positive effect on the return on asset of commercial banks in Ethiopia.

When a bank owns assets or liabilities in other currencies, it is exposed to foreign currency risk, which affects the bank's capital and profitability because of changes in exchange rates. Regardless of the projections and expectations, the exchange rate can go either upward or downward in the upcoming term, and no one can anticipate what it will be. If this erratic movement takes an undesirable and unexpected turn, it could endanger the bank's profits and capital. O. Evans (2014), Songul Kakilli (2013). According to Meselech (2019), and Yohannes (2021) the foreign exchange rate risk has a positive and significant influence on financial performance of commercial banks.

Capital Risk

H6: Capital risk has a significant negative effect on the return on asset of commercial banks in Ethiopia.

The Basel Accords II place a high priority on capital requirements, which establish standards for financial organizations. A financial organization should have enough capital to cover the difference between predicted losses over a given time range and worst-case losses over the same time horizon, according to international standards. Tier I and Tier II are the two categories into which capital adequacy has been separated according to the accords. Core capital is identified as Tier I, while supplemental capital is identified as Tier II. Shareholder equity and declared reserves make up Tier I capital. Undisclosed reserves, revaluation reserves, general provisions, hybrid instruments, and subordinated term debt are all included in Tier II capital (Basel Committee, 2011).

According to the NBE, Capital adequacy refers to a Bank's capital in relation to risk-weighted assets and it is calculated in line with the supervisory organ Directive i.e., No. SBB/9/95. The capital adequacy ratio on the bank's risk-weighted average assets shouldn't be less than 8%, according to the Basel accord. The National Bank of Ethiopia's directive No. SBB/24/99 established a minimum capital requirement of 8% for the bank. The capital adequacy ratio is a ratio that expresses the total capital of the bank as a percentage of its risk-weighted assets according to the NBE. According to Biruk (2015) and Yohannes (2021), capital risk management proxy by capital adequacy ratio had a negative and insignificant effect on financial performance of commercial banks.

Loan Loss Provision

H7: Loan loss provision has a significant effect on return on asset of commercial banks in Ethiopia.

According to Getahun (2015) there exist a positive relation between loan loss provision and financial performance of commercial banks. While, Takeda, Ahmed, and Shawn (1998) in their study found that loan loss provision has statically significant positive effect on NPLs. Thus, a rise in loan loss provision showed an increase in credit risk and deterioration in the quality of loans consequently affecting Bank performance adversely. Elshaday (2017), also founds that loan loss provision have statistically significant negative impact on return on assets.

Bank size

H8: Bank size has a significant positive effect on return on asset of commercial banks in Ethiopia.

The Bank size is generally introduced to account for existing economies of scale in the Banking market. The relationship between size and profitability is an important part of the firm's theory.

Since larger Banks are more capable to realize economies of scale and reduce the cost of gathering and processing information Demerguq-Kunt and Huizingha (1999), Toni Uhomoibhi (2008), Dietrich and Wanzenried (2011), the Bank size should be positively associated with its performance. However, extremely large Banks might illustrate a negative relationship between size and profitability. Elshaday (2017), Abel (2019), and Biruk (2015) found that Bank size has a positive and insignificant relation with financial performance.

2.3. Conclusion and Knowledge Gap

Worldwide, a great deal of research has been done on risk management and how it affects financial performance. Nonetheless, there is still a dearth of Ethiopia-specific research, with certain studies such Biruk (2015 and Yohannes (2021) producing conflicting results. The complex relationship between risk management practices and financial performance in the particular context of Ethiopian commercial banks is frequently overlooked in studies carried out in Ethiopia, which tend to concentrate on more general determinants of financial performance, such as macroeconomic factors or regulatory compliance Gebreyes T (2019; World Bank (2023).

Globally, empirical research highlights that effective risk management enhances financial performance by reducing losses and optimizing resource allocation (Al-Tamimi & Al-Mazrooei, 2020; Aboagye & Otioku, 2021). For example, credit risk management has been shown to significantly influence profitability in developed banking systems.

The Ethiopian banking sector has undergone rapid growth, accompanied by increased competition and a dynamic economic environment. Over the past decade, the number of commercial banks and their branch networks has expanded significantly, reflecting the sector's critical role in the country's economic development Hassen (2023). However, this growth has exposed banks to heightened risks, including credit risk from high NPL ratios, operational risks tied to outdated technology, and market risks caused by foreign exchange volatility (NBE, 2024).

Ethiopia's regulatory environment is still developing. Although the National Bank of Ethiopia (NBE) has taken steps to improve risk management, including as enforcing capital adequacy rules, these procedures are still insufficient to handle the complex risks that banks confront today (NBE, 2021). Studies for instance (Bahiru, 2014) emphasized the need for Ethiopian banks to maintain or increase their capital adequacy ratio to enhance the safety of the banking system. Furthermore, the NBE has been mandated all banks to have a minimum capital adequacy requirement of 8% in

its Directive No. SBB/50/2011 focuses only on credit risk. This was mainly to ensure banks held a capital which significantly absorb the risks from their risk weighted asset. While, the NBE has taken a significant reform in this regard, for example in April ,2025 it has released a new draft directive for measurement of capital adequacy ratio. This directive has aligned with the international standards like BASEL III and aims to give a comprehensive assessment of banks capital adequacy that encompasses credit, operational, and market risks (NBE, 2025).

Additionally, there have been reports of increased liquidity issues as a result of the high concentration of loans and deposits among a limited number of customers. While bonds and loans to deposits have climbed to 87.9%, the loan-to-deposit ratio has decreased to 60.2%. Furthermore, the NPL percentage has increased to 3.9%, highlighting the pressing need for better risk management procedures (NBE, 2024). Ethiopian banks face several challenges in implementing effective risk management frameworks. Studies reveal a lack of comprehensive frameworks and difficulties in aligning with international standards such as Basel II and Basel III (Abebe & Abera, 2020). Digital transformation poses new risks, including cyber threats, as banks adopt technology and partner with third parties. These risks threaten both financial performance and the sustainability of the sector.

Although international studies offer insightful information on the connection between risk management and financial performance, Ethiopian contexts limit their applicability. Variable selection and assessment methods are frequently inconsistent in Ethiopian research. For example, Gidey's (2021) study ignored important metrics like credit risk, liquidity risk, and market risk in favor of using operational risk, capital adequacy ratio, liquidity, and cost-to-income ratios as standards for risk management. Similar to this, Yohannis' (2021) study examined the effects of risk management over a ten-year period, however it neglected to include industry best practices and legal requirements for variable measurement.

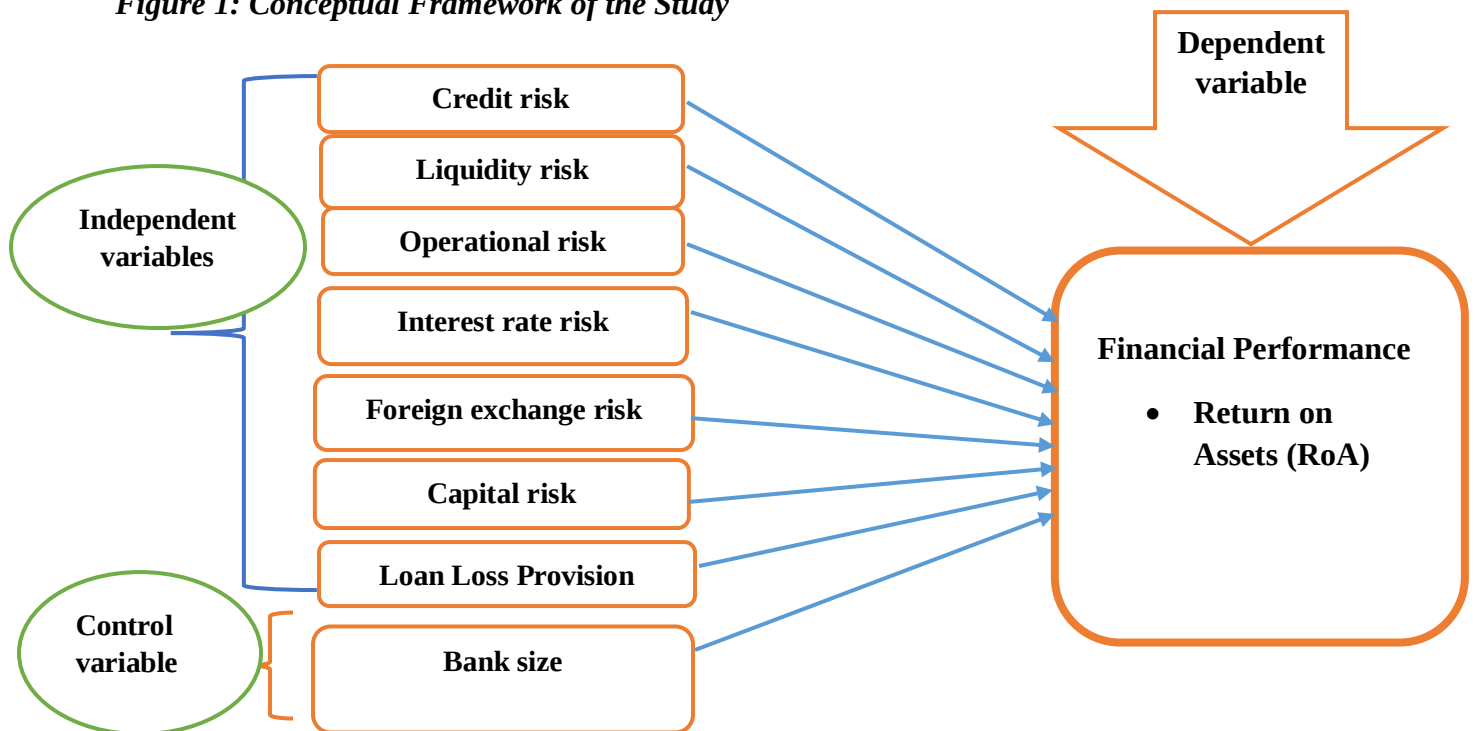
There is a critical need for more robust quantitative investigations to establish causal relationships between risk management practices and financial performance in Ethiopian banks. Such studies can identify key determinants of effective risk management and measure its impact on profitability and stability. Comparative analyses with banks in other emerging economies can provide insights into best practices while highlighting unique challenges faced by Ethiopian banks.

Addressing the identified gaps through targeted research aims to enhance the understanding of risk management in Ethiopian commercial banks and contribute to the broader discourse on financial performance in emerging markets. Thus, the researcher has developed localized frameworks and aims to provide valuable guidance for policymakers and practitioners, strengthening the resilience and efficiency of Ethiopia's banking sector.

2.4. Conceptual Framework

There is an existing gap in the literature regarding the risk management impact on financial performance of commercial banks. Additionally, most of previously conducted study lies in the limited scope of examining only a few variables on banks' financial performance, potentially overlooking other crucial bank specific factors that could influence the outcomes. Therefore, the conceptual framework of this study will illustrate the interrelationship between independent variables and the dependent variable (private commercial bank financial performance).

Figure 1: Conceptual Framework of the Study



Source: Conceptual Framework of the Study developed from the review of literatures and adopted from Lemaa Belay (2021)

CHAPTER THREE

3. RESEARCH METHODOLOGY

3.1. Research Approach

A quantitative research approach was used to achieve this study's objective successfully. The quantitative research approach tests objective theories by examining the relationship among variables Creswell (2009). This research approach places good emphasis on objectivity and is especially appropriate when there is the possibility of collecting quantifiable measures of variables and inferences from samples of a population as well as when it adopts structured procedures and formal instruments for data collection Queirós, Faria & Almeida (2017).

3.2. Research Design

Research design is the plan and structure of investigation so conceived as to obtain answers to research questions. The plan is the overall scheme or program of the research. It includes an outline of what the investigator did from writing hypotheses and their operational implications to the final analysis of data. Cooper and Schindler (2014) This study was employed an explanatory research design. Because the purpose of the study is to identify how one variable produces changes in another.

3.3. Types and Sources of Data Collection

In this study, secondary data was used for the achievement of the studies objective. Secondary data refers to the information gathered from the source that already exist Sekaram & Bougie (2010). To investigate the effect of proxies of risk management on financial performance, related data were collected from banks' financial statements and NBE reports.

3.4. Population and Sampling Technique

For this study, the target population were all Banks registered by NBE and under operation in the country for about eight years. Currently, the country has thirty-one banks including 2 state-owned and 29 private commercial banks, which are operating throughout the country. However, due to the lack of 8 years of data that is required for the analysis function in most of the newly established private banks; the researcher was forced to reduce the sample size to 16 banks by applying a

purposive sampling technique. The researcher believed that the sample size is representative as it covers more than fifty percent of the total population.

3.5. Description and Measure of Variables

i. Dependent Variable

Return on Assets (ROA): This financial indicator assesses a company's profitability by determining how well it can produce profits from its assets. It is computed as a percentage and is obtained by dividing profit after tax by average total assets. One important ratio used to evaluate a bank's financial performance and managerial efficacy is the return on assets (ROA), which shows how well the bank uses its assets to create profit.

$$\text{ROA} = \text{Profit After Tax} / \text{Average Total Asset}$$

ii. Independent Variables

Table 1: Variable Measurement

Category	Measurement
Return on Asset	Profit after tax/average total asset
Credit risk	NPLs to total loans and advances
Liquidity risk	Total Liquid Asset/Current liability
Operational risk	Measured using proxies of efficiency ratio = Operating expense/Operating Income
Interest rate risk	Interest Rate Sensitive Assets/ Interest Rate Sensitive Liabilities
Foreign Exchange risk	Weighted average exchange rate for a period (given year)
Capital Risk	Total Capital/Risk-weighted asset
Loan Loss Provision	Total loan loss provision/Total outstanding loan
Bank size	The natural logarithm of total assets

3.6. Data analysis Techniques and Tools

To accomplish the goal of the study, the data was examined after it has been collected. The data has a time series and cross-sectional nature, so panel data analysis was used to get better results. This econometrics model was employed because the study was used data from 16 commercial banks over 8 years. Additionally, the panel data econometrics model allows for identifying effects that are not detectable in pure cross-sections or pure time-series studies (Tornyeva, 2013).

Descriptive statistics such as mean, minimum, maximum, and standard deviation values was used to analyze the general trends of the data. To test the proposed hypotheses, the collected panel data are analyzed and interpreted by using descriptive statistics, correlation analysis, and multiple regression estimation methods.

Coefficients were interpreted based on their sign, magnitude, and statistical significance. To ensure the validity of the model, key econometric assumptions were tested. Heteroscedasticity was tested with the Breusch- pagan test, and autocorrelation was examined using the Durbin-Watson test. Where necessary, robust standard errors were applied. Multicollinearity was assessed through the Variance Inflation Factor (VIF), which showed acceptable levels. Finally, the Hausman test guided the choice between fixed and random effects models, ensuring the most appropriate model was selected for the analysis. To process the data, the study used the STATA Version 16 software package as a data processing tool.

3.1. Model Specification

The panel regression equation differs from a regular time-series or cross-section regression by the double subscript attached to each variable (Tornyeva, 2013). The general form of the panel data model can be specified as follows is adopted from Berger and Hannan (1993) with modifications to be suited to the objective of this study.

$$Y_{it} = B_0 + \sum_{j=1}^J B_j X_{it}^j + U_{it}$$

Y_{it} is the dependent variable, which is the profitability bank, i at time t , with $i=1 \dots N$, $t=1 \dots T$, β_0 is a constant term; X_{it} is the independent variable in the estimation model over the time t for bank i with the error term U_{it} .

Based on the general form of the panel data model provided before and based on chosen variables the empirical model for the study on hand is specified as follows.

$$ROA_{it} = NPL_{it} + LQR_{it} + OE_{it} + IRR_{it} + FOREX_{it} + CAR_{it} + LLP_{it} + BS_{it} + U_{it}$$

Where:

ROA_{it} = Return on asset of Bank i over the time t

NPL_{it} = Credit risk ratio for Bank i over the time t

LQR_{it} = Liquidity risk ratio for Bank i over the time t

OR_{it} = Operational risk ratio for Bank i over the time t

IRR_{it} = Interest rate risk ratio for Bank i over the time t

$FOREX_{it}$ = Foreign exchange risk for Bank i over the time t

CAR_{it} = Capital adequacy ratio for Bank i over the time t

LLP_{it} = Loan Loss Provision for Bank i over the time t

BS_{it} = Bank size of Bank i over the time t

U_{it} = The error term

CHAPTER FOUR

4. RESULTS AND DISCUSSION

This chapter analyzes and discusses the data collected through documentary analysis of the financial statements of Ethiopian Banks and macroeconomic data from National Bank of Ethiopia. It incorporates the test result for the descriptive statistics, correlation analysis, classical linear regression model assumptions, and the study's regression result. Finally, it presents a detailed discussion of the regression result.

4.1. Descriptive Statistics

This section presents the descriptive statistics of the dependent and independent variables used in the study for the selected sampled commercial banks in Ethiopia. The dependent variable used in the study was ROA, and the independent variables include, credit risk, liquidity risk, operational risk, interest rate risk, foreign exchange risk, loan loss provision and capital risk. Additionally, the control variable bank size has been used. Thus, table 6 summarizes the descriptive statistics of the indicated variables included in the regression model. It presented the variables for 16 commercial banks considering the availability of their financial statements for the fiscal year 2017-2024. The number of observations for the study was 128 (since the study used 8 years of financial data from the 16 commercial banks). The descriptive analysis demonstrates the mean, standard deviation, minimum, and maximum value of the variables for the sampled banks.

Table 2: Result of Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min.	Max.
ROA	128	.0257081	.0080894	.0032573	.0489882
NPL	128	.0354683	.0283572	0	.1895
LQR	128	.2262436	.0776321	.0971239	.46
OE	128	.6244695	.1135812	.3137225	.9765486
IRR	128	1.098438	.2102181	.62	1.67
FOREX	128	.383677	.1221517	.2301421	.5623709
CAR	128	.1785072	.0588893	.0799853	.36
LLP	128	.0186187	.0115663	.0022139	.0636724
BS	128	4.375569	.6177919	1.63	5.350295

Source: Researcher's own computation through STATA16 based on financial statements of Banks

The result of the analysis indicated in Table 6 showed that, across the 128 observations selected banks exhibited an average return on asset (ROA) of 2.57% and a standard deviation of 0.81% with a minimum of 0.33% and a maximum of 4.90%. The return on the asset has been measured using the profit after tax divided by the average total asset. The analyses indicated that the least profitable banks from the sampled banks for the study earned 0.0033 cents of profit after tax for a single cent invested by the banks. While the result for the most profitable banks from the sampled banks shows that, those banks earned 0.049 cents of profit after tax for each cent investment made by the banks. The result for the standard deviation statistics of the dependent variable i.e., ROA showed 0.00809, implying that the profitability variation for the selected sample banks was very narrow.

The analysis of credit risk measured using the ratio of non-performing loans to total loans and advances showed an average NPL of 3.55% and a standard deviation of 2.84% with a minimum of 0% and a maximum of 18.95%. The result of the analysis indicates that from the total loans and advances disbursed by selected commercial banks, an average of 3.55% deteriorated for the selected study period. According to the financial stability report of NBE (2024) the industry average NPLs ratio as of June 2024 was 3.9%, which is higher by 0.35 percentage point than the result obtained. However, it is noted that the average NPLs of 3.55% registered by selected sampled banks is lower than the NBE's set limit of 5%. The zero value was the values of the NPLs for Global Bank Ethiopia for the reporting period of 2023/24. Since the Bank has not reporting defaulted loans for the selected fiscal year. The maximum non-performing loan value of 18.95% indicated that some of the sampled banks have registered the highest credit risk for the period the study covers.

The liquidity risk, which has been measured using the ratio of total liquid assets to current liability indicates a mean value of 22.62% and a standard deviation of 7.76%, and the minimum and maximum values spanning from 9.71% and 46% respectively. It is found that the result is higher by 0.22 percentage point from the industry average liquidity ratio of 22.4% NBE (2024). The average value of liquidity risk indicates that for each 1-Birr current liability, there exist 0.226 cents for settlement of the current financial obligation and the standard deviation of 0.0776 showed a small deviation in the liquidity ratio of sampled commercial banks for the study periods. The maximum value of the liquidity ratio of 0.46 indicates that there exists excess liquidity held by some of the selected banks for the study period. This

suggests that some of the banks can settle their financial obligation at any time within the eight-year covering from 2017-2024. Even though, holding excess liquidity enables banks to safeguard from unforeseen liquidity problems and meet the minimum liquidity ratio of 15% set by the NBE, it will affect the earning of the Bank. The minimum value of liquidity ratio of 0.0971 implies that some of the selected banks have failed to meet the minimum regulatory liquidity requirement of 15% for the selected study period. This shows some of the commercial banks are struggling to meet their short-term maturing obligations for the period between 2017-2024.

An analysis of the cost to income ratio for measuring operational risk showed an average value of 62.45% and standard deviation of 11.36%. The minimum and maximum value of the operational efficiency ratio or cost to income ratio showed an extreme range of 31.37% and 97.65% respectively. The operational efficiency mean value of 0.6244 implies that banks has spent approximately 0.6244 cents for every 1 Birr income generated, indicating relative moderate ratio of cost management but still requires further improvement. The standard deviation of 0.1135 reflects that, selected banks have a slight difference in management of its operating cost in relative to the income generated. The minimum vale of 0.3137 suggests that some of the selected commercial banks for the study period has been operated with low-cost relative to its income. This is an indication of the strong efficiency in managing the cost or there has been a minimal overhead cost incurred by banks. On the other hand, the maximum operational efficiency value of 0.9765, which is high and it indicates that some of selected banks has incur operating cost that erodes their income generated. Possibly this was due to the inefficiency in management of cost or low level of earning during some period.

The analysis of the market risk of the sampled banks for the study period mainly focuses on the bank's risk status concerning interest rate risk and foreign exchange risk. The interest rate risk has been measured using the ratio of interest rate-sensitive assets to interest rate-sensitive liability. The result for interest rate risk shows a mean value of 1.098, indicating that on average the interest-sensitive asset of some selected banks has slightly exceeded interest-sensitive liability by 9.8%. This suggests that most of the banks have maintained a marginally positive gap, that enables them to acquire benefits from the increase in interest rate, as the return from assets is likely higher than the cost of liabilities. However, the standard deviation of 0.21021 indicates a moderate variability in interest rate exposure across selected banks for the stated study period.

The interest rate risk minimum value of 0.62 shows some banks has relatively moderate interest sensitive asset relative to interest sensitive liability. This implies that some banks are highly sensitive to rising in interest rate, since the rise of interest rate could boost the cost of fund relative to the return from earning asset. While, the maximum value of 1.67 suggests that certain banks have substantially higher interest sensitive asset as compared to the interest sensitive liability, making them more sensitive to change in interest rate.

In general, while the average IRR ratio indicates a marginally positive exposure of banks to the change in interest rate, the wide gap i.e. 0.62 to 1.67 shows a diverse interest rate risk profile among selected banks. Banks with ratio significantly higher than 1 may encounter reinvesting risk, conversely, some of the banks with the ratio below 1 could face refinancing risk.

The foreign exchange risk has been measured using the weighted average exchange rate for the period which gives insight into the extent of exposure to exchange rate fluctuation across selected banks. The standard deviation of 0.122 showed a minimum variability in foreign exchange rate variability among selected commercial banks from the fiscal year 2017-2024. The minimum and maximum value of exchange rate risk ranges from 0.230 to 0.562 respectively. The minimum value of 0.230 indicated that some of the selected banks have a lower foreign exchange-related exposure. This may be due to their lower foreign currency-denominated foreign currency asset and liabilities or their best hedging strategies. Conversely, the maximum value of 56.2% depicts that, some of the banks have higher foreign currency-related exposures, exposed to foreign exchange risk. The minimum variability was mainly due to the exchange rate being set by the NBE due to the managed exchange rate policy followed by the regulatory body during the selected period.

As per the NBE, capital adequacy refers to a Bank's capital about risk-weighted assets and it is calculated in line with the supervisory organ Directive i.e., No. SBB/9/95. Thus, the capital risk which is measured using proxies of capital adequacy ratio (total capital to risk-weighted asset) has a mean value of 17.85% and a standard deviation of 5.89%. The mean value is higher by 2.45 percentage point from the industry average capital adequacy ratio of 15.4% sourced from the NBE (2024). The average capital adequacy ratio implies that selected banks hold 17.85% of their risk-weighted asset as capital. Therefore, it is observed that some of the selected banks have held a significant capital buffer to absorb the potential loss. The standard deviation of 0.0588 shows that,

there is a lower variability in capital adequacy ratio among selected commercial banks. The minimum capital adequacy ratio of 0.0799 shows that some of the selected banks have fallen below the minimum regulatory requirements of 8%. This depicts, that some of the selected banks will fail to absorb the potential loss emanated from their risk-weighted asset. Conversely, the maximum capital adequacy ratio of 0.36 (36%), implies that certain banks hold exceptionally higher capital buffers, enabling them to absorb the potential loss from their risk-weighted asset. However, holding such a higher capital buffer hinders the bank's earnings from the investment and lending activity since a significant portion of the capital is tied as a reserve for their risk-weighted asset.

An analysis of the LLP which is measured using total LLP to total outstanding loan ratio has a mean value of 0.0186 (1.86%) and standard deviation of 0.0115. The LLP average value of 0.0186 implies that, on average, selected banks allocate 1.86% of their loan portfolio as a provision for safeguarding a potential loan default. The standard deviation of 0.0115 indicates there is a low variation among selected banks concerning the loan provisioning practice. The minimum and maximum value of LLP for selected banks shows 0.00221 and 0.0636 respectively. The minimum value of 0.22% indicates that, some of the selected banks has holding a minimum provisioning as compared to their loan portfolio, while the maximum value of 6.37% implies certain banks allocate substantial provisioning for loan loss.

Using the natural logarithm of the banks' total assets, the size of the bank is one indicator of banking performance. Its mean depicts 4.375, and its standard deviation is 0.6177. The bank size has a minimum of 1.63 and a maximum of 5.35. Given the log transformed scale, which has a minimum and maximum range of 1.63 to 5.35, the sampled banks are mid-sized, as indicated by the average bank size of 4.37. The chosen commercial banks' sizes exhibit a moderate degree of variance, as indicated by the standard deviation value of 0.617.

4.2. Correlation Analysis

To understand the relationship between the dependent and independent variables, correlation analysis was conducted. As explained by Brooks (2008), correlation measures the degree of linear association between two variables. The correlation coefficient ranges from +1 to -1, where a value of +1 indicates a perfect positive relationship, -1 signifies a perfect negative relationship, and 0 implies no linear relationship between the variables. The researcher used Pearson's correlation

coefficient matrix generated through the Stata 16.0 software which shows the cross-relationship between ROA and predictor variables.

The correlation matrix shows that the ROA proxy of bank financial performance has a negative correlation with credit risk, operational risk, foreign exchange risk, loan loss provision and bank size. It is indicated in table below, Operational risk (Cost-to Income ratio) is the most negatively correlated variable with the movement of ROA with a correlation coefficient of -0.8091. Additionally, Bank size had shown insignificant negative correlation with the movement of bank's financial performance with a correlation coefficient of -0.1147.

While it is depicted that, liquidity risk, interest rate risk, and capital risk have a positive correlation with ROA. It has reflected that, the capital risk (total capital to risk weighted asset) is the most positively correlated variable with the ROA with a coefficient of 0.5366, while the interest rate risk has shown insignificant positive correlation with ROA with a coefficient of 0.2774.

Table 3: Correlation matrixes between dependent and f independent variables

corr	ROA	NPL	LQR	OE	IRR	FOREX	CAR	LLP	BS
ROA	1.0000								
NPL	-0.4089	1.0000							
LQR	0.3621	-0.1223	1.0000						
OE	-0.8091	0.4360	-0.2885	1.0000					
IRR	0.2774	-0.0603	0.0030	-0.1002	1.0000				
FOREX	-0.1649	0.1659	-0.1074	0.3462	0.1377	1.0000			
CAR	0.5366	-0.1791	0.3476	-0.4674	0.1643	-0.2794	1.0000		
LLP	-0.4352	0.6069	0.0545	0.5163	-0.0081	0.2418	-0.1073	1.0000	
BS	-0.1147	0.0088	-0.0408	-0.0862	0.0905	0.1096	-0.1980	0.0039	1.0000

Source: Researcher's own computation through STATA16 based on financial statements of Banks

4.3. Model Specification

The study employed panel data collected from sixteen Ethiopian commercial banks during the fiscal year of 2017 to 2024. For this panel data, either a random effect or fixed effect model can be applied. The choice between the fixed effect model and the random effect is to be determined by conducting a formal test known as the Hausman test. The Hausman test is used to examine the

null hypothesis that states the random effect is appropriate. The Hausman test is presented as follows:

Table 4: Hausman Test Result

hausman fe re

	(b) ——— Coefficients ——— te	(B) re	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
NPL	-.016458	-.0103987	-.0060593	.0048887
LQR	.0080915	.0107206	-.0026291	.0019746
OE	-.0600804	-.0543639	-.0057164	.0023322
IRR	.006017	.0065955	-.0005785	.0007502
FOREX	.0138368	.0109187	.0029181	.0014248
CAR	.0191027	.0157625	.0033402	.0073534
LLP	-.0694086	-.0550838	-.0143247	.0199501
BS	-.0027635	-.0025071	-.0002564	.0001403

b = consistent under Ho and Ha; obtained from xtreg

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

Test: Ho: difference in coefficients
not systematic $\chi^2(8) =$
 $(b-B)'[(V_b-V_B)^{-1}](b-B) = 12.93$
Prob>chi2 = 0.1144
(V_b-V_B is not positive definite)

As depicted in Table 6 above, the Hausman test reveals a p-value of 0.1144, which is greater than 0.05. Therefore, the researcher failed to reject the null hypothesis, indicating that the random effect is a suitable model for the study.

4.4. Test of Classical Linear Regression Model Assumptions

In this section, the researcher evaluates whether the data is suitable for a linear regression model by fulfilling the assumptions of a classical linear regression model. The following assumptions were tested: the data's normality, homoscedasticity, free from autocorrelation, and non-multicollinearity.

4.4.1. Normality Test

A normal distribution is a perfectly symmetric, mound-shaped distribution. It is commonly referred to as a normal, or bell curve. Because so many real data set closely approximate a normal

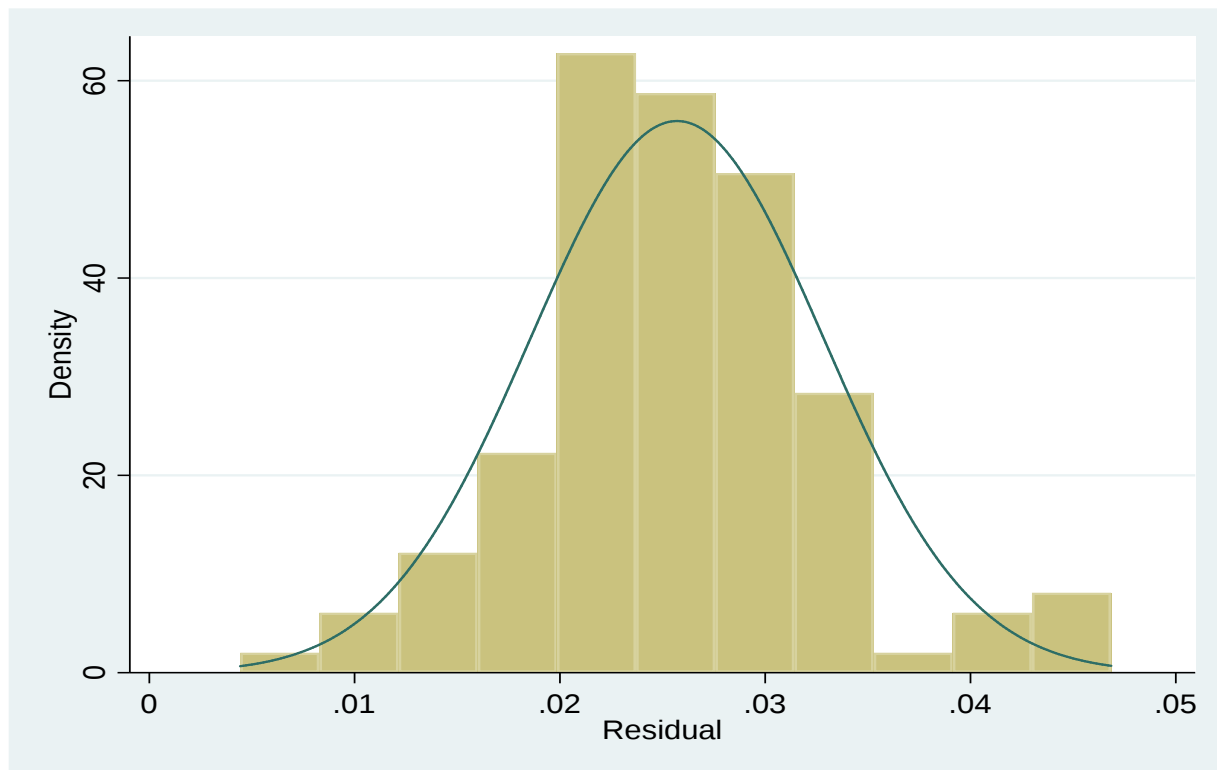
distribution. In real data collection, the distribution will never be exactly symmetric (CK-12 Foundation, 2012).

A perfectly symmetrical, mound-shaped distribution is called a normal distribution. It is frequently called a bell curve or normal curve. Because a normal distribution is quite similar to many real data sets. The distribution will never be perfectly symmetric in real-world data collecting (CK-12 Foundation, 2012).

The normal distribution can be tested using either of graphical test or other statistical tests such as Skewness/Kurtosis and Shapiro-Wilk W test. In the following section, the normality of the residual is checked in both tests.

To ascertain whether the normality assumption had been met in this study, the researcher used a histogram. Brooks (2008), states that a bell-shaped curve should be seen in the histogram if the residuals are normally distributed. Figure 1 below shows the residuals are normally distributed.

Figure 2: Normality test for the residual



Source: Researcher's own computation through STATA16 based on financial statements of Banks

4.4.2. Skewness/Kurtosis Tests for Normality

The other statistical of normality is the Skewness/Kurtosis tests for normality. The output of these tests presented in Figure 3 below indicates the P-value of 0.0509. Since the P-value is insignificant the researcher failed to reject the null hypothesis, therefore this data believed to be consistent with a normal distribution assumption.

Figure 3: Skewness/Kurtosis tests

Variable	Skewness/Kurtosis tests for Normality				
	Obs	Pr(Skewness)	Pr(Kurtosis)	adj hi2(2)	Prob>chi2
Residual	128	0.2416	0.0278	5.96	0.0509

Source: *Researcher's own computation through STATA16 based on financial statements of Banks*

4.4.3. Test of Assumption of Homoskedasticity

The other assumption of the classical linear regression model is that the variance of U_i for each X_i (i.e., the conditional variance of U_i) is some positive constant number equal to σ^2 (Gujarati, 2004). Violation of the homoscedasticity assumption means that the error terms have a varying variance (Baltagi, 2008).

Table 5: Heteroscedasticity Test

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity Ho: Constant variance			
Variables: NPL LQR OE IRR FOREX CAR LLP BS			
	chi2(8)	=	41.72
	Prob > chi2	=	0.0000

Source: **Researcher's own computation through STATA16 based on financial statements of Banks**

As shown in the Breusch- pagan test result, the p-value is 0.0000, which is below the 5% level of confidence. As a result, the researcher had rejected the null hypothesis of constant variance. Therefore, the study's data violated the homoscedasticity assumption. Therefore, robust regression will be employed as a remedy for the heteroskedasticity problem.

4.4.4. Test of Autocorrelation

The classical model assumes that the disturbance term relating to any observation is not influenced by the disturbance term relating to any other observation.

The Durbin- Watson test statistics tests the null hypothesis that the residuals from an ordinary least square regression are not correlated with each other. As shown in table 3 below Durbin- Watson test statistics ranges in value from 0 to 4. The value that approaches zero shows a positive autocorrelation, the value nearest to 2 indicates no autocorrelation; on the other hand, if the Durbin-Watson value is approached to four it indicates negative autocorrelation.

Table 6: Autocorrelation Test

Durbin-Watson d-statistic (9 , 128) = 1.870362
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Source: Researcher's own computation through STATA16 based on financial statements of Banks

In the regression output of this study, the DW statistic value is 1.870362. Referring to the DW table, the critical values of dL and dU for 9 regressors (including a constant term) and 128 observations at a 5% significance level are 1.608 and 1.862, respectively. Therefore, the DW statistic of 1.870362 is close to 2. Based on this result, the researcher failed to reject the null hypothesis, indicating no serial correlation in the error term. Consequently, the data does not show autocorrelation.

4.4.5. Test of Multicollinearity

Multicollinearity is a problem that arises when one of the predictor variables is very highly correlated with the other predictor variables. Thus, the correlation coefficient between two explanatory variables is one, which shows a perfect correlation between them. In practice neither of the two extreme cases (i.e., perfect co-linearity nor orthogonal) exist, rather there is some degree of inter correlation among explanatory variables. The correlation coefficient for each pair of explanatory variables will have a value between zero and one. Multicollinearity is inherent due to interdependency of many economic variables. So, it is a question of degree but not of its existence.

Different authors forwarded different ideas about the cut-off point that will be used as a guideline to judge the presence of multicollinearity problems. According to (Hair, Black, Babin, Anderson

& Tatham, 2006) correlation coefficient below 0.9 may not cause a multicollinearity problem. On the other hand, Kennedy, (2008) states the correlation coefficient between explanatory variables of above 0.7 could cause a serious multicollinearity problem that leads to inefficient estimation and less reliable ordinary least square regression results.

Table 7: Correlation matrixes of predictor variables

	NPL	LQR	OE	IRR	FOREX	CAR	LLP	BS
NPL	1.0000							
LQR	-0.1223	1.0000						
OE	0.4360	-0.2885	1.0000					
IRR	-0.0603	0.0030	-0.1002	1.0000				
FOREX	0.1659	-0.1074	0.3462	0.1377	1.0000			
CAR	-0.1791	0.3476	-0.4674	0.1643	-0.2794	1.0000		
LLP	0.6069	0.0545	0.5163	-0.0081	0.2418	-0.1073	1.0000	
BS	0.0088	-0.0408	-0.0862	0.0905	0.1096	-0.1980	0.0039	1.0000

Source: Researcher's own computation through STATA16 based on financial statements of Banks

As shown in Table: 4 above in this study the maximum correlation coefficient between independent variables is 0.6069 (between Loan loss provision and None non-performing loan ratio), which is below 0.7. Therefore, in this study, there is no very high correlation that could affect the regression coefficient.

To ensure whether this study is free from multicollinearity problems the variance inflation factor has also been used. As shown in Table 5 below, the variance inflation factor (VIF) values of all variables are less than 10, this shows there is no multicollinearity problem in this study.

Table 8: Test of multicollinearity using VIF

Variable	VIF	1/VIF
OE	2.09	0.477868
LLP	2.03	0.491595
NPL	1.68	0.596064
CAR	1.58	0.631981
LQR	1.25	0.800420
FOREX	1.23	0.810021
BS	1.13	0.888472
IRR	1.09	0.913709
Mean VIF	1.51	

Source: Researcher's own computation through STATA16 based on financial statements of Banks

4.5. Regression Analysis and Discussion of the Results

In this section, the researcher presented a detailed discussion and analysis of the panel regression results obtained from the random effects model.

4.5.1. Results of Regression Analysis

The random effect regression result of the study is presented in this section as follows. The study's hypotheses are tested and the effect of explanatory variables on the return on asset of sampled commercial banks are presented and analyzed.

Empirical model: As presented in the earlier chapter, the researcher developed the following empirical model, so as to examine the effect of risk management on financial performance of Ethiopian commercial banks as given below.

$$ROA_{it} = NPL_{it} + LQR_{it} + OE_{it} + IRR_{it} + FOREX_{it} + CAR_{it} + LLP_{it} + BS_{it} + U_{it}$$

To measure how well the predictor variables, explain the predicted variable, it is often useful to compute the value of R-squared or coefficient of determination. The regression R^2 is the fraction of the sample variance of dependent variable (ROA) explained by (or predicted by) the independent (risk management variables) in the study (Stock and Watson, 2019).

The higher value of R^2 indicates good fit to the data in explaining the predicted variable, while, the lower value indicates a poor fit of the OLS model. That means very little of the variation in the dependent variable is captured by the variation of independent variables (Wooldridge, 2013). In this study the overall value of R^2 is 0.7768, implying that approximately 77.68% of variations in return on asset (RoA) are explained by all the explanatory variables and the remaining 22.32% is captured by the error term. Thus, one can determine that the model in this study shows a significant relationship of return on asset with credit risk, liquidity risk operational risk, market risks, loan loss provision, capital risk and control variable incorporated in the empirical model. Furthermore Prob. chi2 value of 0.000 shows strong statistical significance, which enhanced the reliability and validity of the model.

Table 9:Regression Result for the Impact of Risk Management on RoA

. xtreg ROA NPL LQR OE IRR FOREX CAR LLP BS,re robust

Random-effects GLS regression	Number of obs	=	128
Group variable: CompanyCode	Number of groups	=	16
R-sq:	Obs per group:		
within = 0.7218	min	=	8
between = 0.8666	avg	=	8.0
overall = 0.7768	max	=	8
	Wald chi2(8)	=	1378.71
corr(u_i, X) = 0 (assumed)	Prob > chi2	=	0.0000

(Std. Err. adjusted for **16** clusters in CompanyCode)

ROA	Coef.	Robust Std. Err.	z	P> z	[95% Conf.	Interval]
NPL	-.0103987	.0122192	-0.85	0.395	-.0343478	.0135504
LQR	.0107206	.0058549	1.83	0.067*	-.0007548	.0221961
OE	-.0543639	.0090871	-5.98	0.000**	-.0721744	-.0365535
IRR	.0065955	.0025159	2.62	0.009**	.0016644	.0115265
FOREX	.0109187	.0034144	3.20	0.001**	.0042266	.0176108
CAR	.0157625	.0125234	1.26	0.208	-.0087828	.0403079
LLP	-.0550838	.0481682	-1.14	0.253	-.1494917	.039324
BS	-.0025071	.0006887	-3.64	0.000**	-.0038569	-.0011572
_cons	.0553478	.0097928	5.65	0.000	.0361542	.0745414
sigma_u	.00130079					
sigma_e	.00350476					
rho	.12107368	(fraction of variance due to u_i)				

*** and * denotes significant level of variables at 1%, and 10%, respectively***Source: Researcher's own computation through STATA16 based on financial statements of Banks**

As shown in Table: 8 above, from eight explanatory variables included in the regression model, five variables (Liquidity position measured by the liquidity ratio, operational efficiency, interest rate risk, foreign exchange risk, and bank size) had a statistically significant impact on Ethiopian Banks' financial performance measured by their return on asset ratio. Except for the liquidity position which is marginally significant at 90% level of confidence, all other four variables are statistically significant at 99% level of confidence.

4.5.2. Analysis and Discussion of the Result

The above sections of this chapter, descriptive analysis and diagnostic test model specification and model fitness are analyzed and discussed. In this sub-section, the robust random effect regression result is discussed and the formulated alternative hypotheses are tested.

Liquidity Position and Return on Asset (RoA)

H₂: Liquidity risk has a significant and negative impact on return on asset of commercial banks in Ethiopia.

Liquidity position measured by the ratio of liquid assets to current liability had a positive effect on the return on asset of Ethiopian commercial Banks. This variable is only marginally significant at 90% level of confidence with a p-value and coefficient of 0.067 and 0.01072, respectively. The beta coefficient indicates that all other things being constant, an increase in the liquidity position of banks by 1% will increase their return on asset by 0.01072% and vice versa. This suggests that a bank with more liquid asset tends to earn more in its asset than bank with less liquid asset. The result of regression is in line with prior expectation of hypothesis formulated in the introductory chapter about its indirect relationship with the return on asset. The lower liquidity ratio means higher liquidity risk that will lead to diminished return from investment in asset. Since banks are highly leveraged institutions, holding an optimal liquid asset to meet the demand of depositors would have a detrimental impact on their resource mobilization, and earning asset growing performance.

Currently, due to the credit cap policy from the National Bank of Ethiopia, the financial industry is at higher liquidity problem. As a result, a good liquidity position can be one competitive advantage to be the first choice of customers. If a bank does not have enough liquid assets, it will fail to execute its outgoing Real-Time Gross Settlement (RTGS) and other obligations to customers. As a result, the bank will face complaints from customers and report to the NBE, results it will be fined a Birr 20,000 per day for delay in each RTGS transaction. To reduce this liquidity risk, the Bank should find another costly source of finance, such as mobilizing deposits or borrowing at a higher interest rate, implying that an optimal higher liquidity position can positively contribute to the bank's profitability. The other potential reason for the positive effect of liquidity position will be the fact that banks maintain a significant portion of their liquid asset in the form of deposits at other peer banks, earning higher interest income.

The finding is consistent with the findings of previous studies such as (Linawati *et al.*, 2023), (Moeljadi, Djumahir, and Siti Aisjah Berhanu, 2021), (Tegbaru, *et al.*, 2019), and (Ismail, 2016) that were conducted in Ethiopia and abroad. These studies found that having optimal liquid assets is vital to enhance profitability. In contrast, this finding contradicts to the finding of Moussa and Boubaker (2020), who found a negative but insignificant effect of liquidity position on the profitability of banks in Tunisia.

Operating Efficiency and Return on Asset (RoA)

H3: Operational risk has a significant and negative impact on return on asset of commercial Banks in Ethiopia.

Operational efficiency is used to measure the operational risk of banks. When banks' operational efficiency is low, it implies the Bank is exposed to operational risk. The beta coefficient of operational efficiency is negative and statistically significant confirming prior expectation during the hypothesis development. The negative coefficient (-0.0543639) indicates that an enhancement efficiency of a bank by 1% will increase its return on asset approximately by 0.054%. Because the lower cost to income ratio indicates the higher operating efficiency. Based on this analysis the study found that operational efficiency has significant effect on return on asset of Ethiopian commercial banks. As it was discussed in descriptive analysis, the sampled banks average operating efficiency ratio was 62.44%, which is higher than expected optimal operating efficiency ratio of 50% in the international literature. This will be due to the strong competition in the industry during the study period in many aspects, such as attracting and retaining skilled workforce, expanding branch networks and enhancing digital banking capacity.

The Basel Committee on Banking Supervision emphasized operational risk in its Core Principles for Effective Banking Supervision (BCBS,1997), stipulating that supervisors must ensure banks maintain risk management policies and processes to identify, assess, monitor, and mitigate operational risk. In its 2003 guidelines, Sound Practices for the Management and Supervision of Operational Risk, the committee offered further advice to banks on managing operational risk as part of the preparation for Basel II, which necessitated a capital allocation for such risks.

This result is consistent with that of Yohannes (2021), Endawek (2015), Mitku (2015), and Gidey (2021), who concluded that operational risk significantly and negatively affects commercial banks' financial performance. However, the results are in contradict with those of Biruk (2015), who

found that operational risk management procedures significantly and positively affect banks' performance statistically.

Interest Rate Risk and Return on Asset (RoA)

H4: Interest rate risk has a significant negative effect on return on asset of banks in Ethiopia.

Interest rate risk is the ratio of interest sensitive asset to interest rate sensitive liability had significant positive effect on return on asset of commercial banks in Ethiopia. Interest rate risk ratio measured by interest sensitive asset to interest sensitive liability is statically significant at 99% level of confidence with a p value of 0.009 and a beta coefficient of 0.0065955. The positive coefficient of the interest rate sensitive asset to interest rate sensitive liability reveals that it has a direct relation with financial performance (ROA). Thus, the result indicates that, the rise in ratio of interest sensitive asset to interest sensitive liability, would mean the risk emanated from interest rate is lower. Thus, the income from earning asset has exceeded the cost of funds, leads rise for ROA.

The beta coefficient shows that as ratio of interest rate sensitive asset to interest rate sensitive liability rise by 1%, which leads increase in return on asset by .00659%. This implies that, banks holding higher earning asset has the ability to registered higher return than those holding lower interest rate sensitive assets, in case the interest rate increases. While, it is important to note that, banks whose interest rate sensitive liability exceeded interest earning asset, would incur significant funding cost, which deter financial performance.

As it has been discussed in descriptive statistics section, interest rate risk mean value of 1.098, indicates that on average the interest sensitive asset of some selected banks has slightly exceed interest sensitive liability by 9.8%. This suggests that most of the banks has maintain marginally positive gap, that enable them to acquire benefit from the increase in interest rate, as the return from asset is likely higher than the cost of liabilities. In such case the risk posed on such banks with respect to the change in interest rate is low.

It has been demonstrated that the NBE has adopted a new monetary policy framework as of July 2024 in order to achieve its goals of maintaining low and steady inflation (NBE, 2024). The NBE has implemented measures such as switching to an interest rate-based monetary policy regime in accordance with the monetary policy framework. Influencing the overall monetary and credit

situation is the primary goal of the new policy. According to the NBE's statement, interest rates will be raised or lowered in accordance with the condition of monetary policy and the current inflationary trend.

The bank established its initial interest rate at 15%, which is slightly less than the 16–20% range that commercial banks use. However, the current monetary policy measures have not resulted in a modification to the minimum saving rate of 7%. Thus, the statement illustrates that there are possible factors that could compel interest rates to fluctuate in response to changes in monetary policy and economic conditions. Commercial banks may be impacted if there is a specific percentage change in interest rate assets that hinders their financial performance.

This finding relatively aligns with the findings of (GEBREYES, 2019), where interest rates risk has been identified as a critical determinant of financial performance. On the other hand, (Aruwa, 2014), (Tassew, Abel Worku; Hailu, Aregu Asmare, 2019), and Yohannis (2021) highlighted there exist a negative relation between interest rate risk and financial performance of banks.

Foreign Exchange Risk and Return on Asset (RoA)

H5: Foreign exchange rate risk has a significant positive effect on return on asset of commercial banks in Ethiopia.

Foreign exchange risk, which is measured using the daily weighted average exchange rate, had a positive and significant effect on return on assets for the selected commercial banks with a 99% confidence level. The finding infers that an increase in the exchange rate by 1% will improve banks' return on assets by 0.0109%. This would be because the target Banks of the study have an operating life of more than eight years. As a result, they would have a higher amount of foreign currency assets than foreign currency liabilities. So, an increase in exchange rate will enable them to earn a revaluation gain from the fluctuation and earn a fee and commission income from exporters who have a favorable advantage from the rate change. This finding is aligned with the results of studies conducted by Yohannis (2021) and Meselech (2019). However, it contradicts to the findings of Elhussein and Osman (2019), Girum (2020) and Tewodros (2019).

Bank Size and Return on Asset (RoA)

H8: Bank size has significant positive effect on the return on asset of commercial banks in Ethiopia.

Concerning effect of Bank size on banks' profitability, the regression analysis indicates the relation between bank size and return on asset ratio is negative and statistically significant at the 99% confidence level with a coefficient of $-.0025071$ and p-value of 0.000 . From this, one can understand that holding other variables constant, an increase in assets by 1% will lead to a diminishing of the Bank's return on assets by 0.0025% . The growth of an asset may not directly cause a decline in profitability; however, if the growth of an asset fails to increase banks' return by the same percentage, the average return will decline. This will be due to the dynamic change in the industry resulting the cost of mobilizing resources will be high. Additionally, larger banks may experience higher overhead cost or operational complexity that reduce profitability despite the growth of asset.

This finding is consistent with the Yadave *et al.* (2022), who examined the firm size effect on 12,001 sample firm in Assian Pasific market and found that while profitability initially rises as the firm grows, over time, profit rate gains diminish as size increases, proving that inefficiency is a byproduct of great scale. On the contrary, this negative relationship is contradicted from the findings of Melaku (2016) and Samuel (2015), who found a positive and significant effect of Bank asset size on the profitability of Banks.

CHAPTER FIVE

5. SUMMARY of FINDINGS, CONCLUSION AND RECOMENDATIONS

5.1. Introduction

The study's results were presented and discussed in the previous chapter and the conclusions and recommendations made in light of the study's findings are covered in this chapter. The chapter is organized into three sections. The first part presents the summary of major findings of the study, followed by conclusions and the third part focuses on feasible and practical recommendations to the regulator, and the banks' management, as well as for concerned parties. The last section provides suggestions that future studies should consider.

5.2. Summary of Findings

The primary objective of this study was to identify the effect of risk management on the financial performances of selected commercial banks in Ethiopia. The researcher reviewed the results of several empirical investigations, Basel's guidelines, and other sources from the literature to choose which risk variable to evaluate. Secondary data were collected from the National Bank of Ethiopia and the annual reports of commercial banks to accomplish this objective. The study has used eight independent variables including, credit risk, liquidity risk, operational risk, interest rate risk, foreign exchange risk, loan loss provision, capital risk, and control variable bank size to analyze their impact on dependent variables named return on asset (ROA). Thus, in line with data analysis and discussion, the following major findings were addressed: -

Based on the analysis of the descriptive statistics of variables it has been found that, across the 128 observations selected banks exhibited an average return on asset (ROA) of 2.57% and standard deviation of 0.81% with a minimum of 0.33% and a maximum of 4.90%. The analysis of the credit risk which is measured using the ratio of non-performing loans to total loans and advances indicates the average value of NPLs of 3.55% with minimum and maximum values ranging from 0% and a maximum of 18.95%. This implies that from the disbursed loans and advances of selected commercial banks on average 3.55% has deteriorated. While it is below the NBE's maximum limit of 5% it is observed that certain selected banks have exceeded the limit with a maximum value indicated 18.95%.

The analysis of liquidity risk measured using total liquid assets to current liability depicts an average value of 22.62%, with the minimum and maximum values spanning from 9.71% and 46%, respectively. Accordingly, it is evidenced that the average value of liquidity ratio of 22.62% implies that, it is above the minimum regulatory requirement of 15%. Additionally, the maximum value of 46% suggests, that certain banks have registered a liquidity ratio that is significantly higher than the regulatory requirement. Therefore, holding such excess liquidity safeguards such banks from liquidity risks. Similarly, the cost-to-income ratio has been used to analyze the operational risk of the selected banks. Consequently, it has been found a mean value of 62.45% and a standard deviation of 11.36%, with the minimum and maximum showing an extreme range of 31.37% and 97.65% respectively.

The descriptive statistics analysis of market risk indicates that interest rate risk measured using the interest-sensitive asset to interest-sensitive liability shows a mean value of 1.098, indicating that on average the interest-sensitive asset of some selected banks has slightly exceeded interest-sensitive liability by 9.8%. Additionally, the minimum value of 0.62 and maximum value of 1.67 have been observed for interest rate risk. Thus, Banks with a ratio significantly higher than 1 may encounter reinvesting risk, conversely, some of the banks with a ratio below 1 could face refinancing risk. On the other hand, the foreign exchange risk has been measured using the weighted average exchange rate for the period resulting in a mean value of 0.384, suggesting on average 38.4% of asset or liabilities of selected banks are exposed to exchange rate fluctuation. The minimum and maximum value of exchange rate risk ranges from 0.230 to 0.562 respectively.

The other proxies of risk management i.e. capital risk which are measured using proxies of capital adequacy ratio (total capital to risk-weighted asset) has a mean value of 17.85% and standard deviation of 5.89%. The minimum and maximum capital adequacy ratio shows a value of 0.079 and 0.36, respectively. Even though certain banks have achieved the minimum requirement of 8%, some of the selected banks have still faced a capital risk by registering below the requirement. An analysis of loan loss provision showed a mean value of 0.0186 (1.86%) and a standard deviation of 0.0115. The minimum value of 0.22% implies some of the selected banks have held a minimum provisioning as compared to their loan portfolio. While maximum value of 6.37% implies certain

banks allocate substantial provisioning for loan loss. Additionally, the Bank size has sown mean of 4.375, and its standard deviation is 0.6177, with a minimum of 1.63 and a maximum of 5.35.

5.3. Conclusions

Based on the findings of the study the researcher has concluded that liquidity risk has marginally significant and negative effect on profitability of banks in Ethiopia. That means the lower liquidity ratio means higher liquidity risk that will lead to diminished return from asset investment and the reverse is true. Since banks are highly leveraged institutions, holding an optimal liquid asset to meet the demand of depositors would have a detrimental impact on their resource mobilization, and earning asset growing performance. Similarly, operational risk has a significant and negative effect on profitability of banks. Meaning that commercial banks have been suffering the efficient management of cost relative to the income generated, which would erode profitability.

Based on the study's findings, interest rate risk which is measured using interest rate sensitive asset to interest rate sensitive liability have a significant and positive effect on the performance of banks. This is primarily due to the increase in interest-sensitive assets relative to interest-sensitive liability lowers the risk faced by banks while the rise of interest-sensitive liability leads the cost of funding to become high which erodes profitability and leads to interest rate risk in case of a change in interest rate. Likewise, foreign exchange risk has a significant and positive effect on the performance of commercial banks. This means the rise in the exchange rate has a positive effect on banks' performance, this is mainly because the selected banks for the study have an operating life of more than eight years, as a result, they have to hold higher foreign currency assets in relative to foreign currency liability which enables to register gain on rate fluctuation.

The researcher also concludes that bank size has a significant and negative effect on the performance of commercial banks. These might be because larger banks may experience higher overhead costs or operational complexity that reduce profitability despite the growth of assets. The researcher concludes that some of the variables tested such as nonperforming loans, capital adequacy ratio, and loan loss provision have no statically significant relation with the return on assets of commercial banks.

5.4. Recommendations

- The study found a statistically significant and positive relationship between liquidity position and return on assets, suggesting that banks with stronger liquidity risk management practices tend to achieve better financial performance. In the Ethiopian context, however, banks predominantly rely on traditional liquidity management approaches based on theoretical asset maturity, such as classifying reserves at the National Bank of Ethiopia (NBE) and short-term deposits in other local banks as liquid assets. These approaches may not ensure actual liquidity, as access to these funds is often constrained by regulatory requirements and the liquidity status of peer institutions.

Therefore, it is recommended that commercial banks adopt more robust and contemporary liquidity management frameworks, such as the Liquidity Coverage Ratio (LCR) and the Net Stable Funding Ratio (NSFR), to enhance their resilience against liquidity shocks. In addition, improving liquidity forecasting capabilities is essential to anticipate potential shortfalls and to ensure optimal utilization of excess liquid assets through instruments like overnight interbank lending or participation in open market operations.

Furthermore, to strengthen liquidity positions sustainably, banks are encouraged to intensify their resource mobilization efforts, particularly by targeting retail deposits. Retail deposits are generally more stable compared to corporate deposits and can contribute to financial stability while promoting financial inclusion by expanding services to underserved segments of the population.

- Improving operational efficiency is essential for maximizing bank profitability and enhancing shareholder returns. The findings of this study suggest the need for commercial banks to reduce overhead costs by leveraging digital banking solutions and other cost-effective technologies. This approach not only supports efficiency but also enhances service delivery and competitiveness.

In addition, there is a need to revise and strengthen the methodologies used to measure operational efficiency within the Ethiopian banking sector. Currently, both the National Bank of Ethiopia (NBE) and many commercial banks evaluate operational efficiency based on the ratio of non-interest expense to non-interest income. However, given that interest income constitutes the primary source of revenue for most Ethiopian banks and non-interest income

represents only a small proportion, this method is misaligned with international standards and may lead to misleading conclusions.

Therefore, it is recommended that operational efficiency be assessed using a more comprehensive metric specifically, the ratio of non-interest expense to the sum of net interest income and non-interest income. Adopting this more accurate and internationally accepted approach will provide clearer insights into cost management practices and support more informed decision-making by both regulators and bank management.

- The study identified a positive relationship between interest rate risk management and bank profitability, indicating that effective management of interest-sensitive assets can contribute to enhanced financial performance. Based on this finding, it is recommended that commercial banks focus on strategies to optimize their interest-earning assets in order to sustain and improve profitability.

This recommendation is particularly relevant because interest income typically represents the primary source of revenue for Ethiopian commercial banks. Maximizing interest-earning assets such as loans and investments in interest-bearing instruments enables banks to generate higher returns, especially when these assets are managed prudently in response to interest rate fluctuations. In an environment where non-interest income remains limited, strengthening the composition and yield of interest-sensitive assets is vital for maintaining a strong earnings profile and ensuring long-term financial stability.

Therefore, banks are advised to enhance their asset allocation frameworks by prioritizing productive lending and investment opportunities, while simultaneously implementing sound interest rate risk mitigation tools to safeguard against adverse rate movements.

- The positive statistically significant effect of exchange rate movement indicates banks were benefiting from the upward change of exchange rate. Banks easily managed their market risk in the previously managed exchange rate regimes. However, following the implementation of the new floating exchange rate policy, Banks' exposure to exchange rate fluctuation will be much higher. Hence, it is recommended to have an optimal balance of foreign currency assets and foreign currency liabilities.

5.5. Suggestion for Further Studies

Even yet, this study sheds some light on the key risk variables influencing the profitability of Ethiopian banks. It has encountered certain constraints including the non-availability of some financial ratio indicators. As a result, the researcher makes the following recommendations for additional research on this subject.

First, the researcher had used the foreign exchange rate to estimate foreign exchange risk, because there was a lack of open position data or information on banks' foreign assets and liability. Therefore, it is preferable to carry out additional research utilizing open position ratio or foreign asset to foreign liability mismatch data to appropriately measure this risk. Additionally, it is also advised to carry out further research with a greater number of banks to enhance the generalizability of the findings. Moreover, the researcher has addressed some of the risk management proxies, while there are other proxies of risk management including, reputational risk, strategic risk, fraud risk, and information technology risk which need to be assessed and address their impact on financial performance.

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ANNEX

Annex I: Normality test

. sktest ROA						
Skewness/Kurtosis tests for Normality						
Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	joint Prob>chi2	
ROA	128	0.2406	0.1528	3.49	0.1745	

Annex II: Test of Autocorrelation

. gen time=_n						
. tsset time						
time variable: time, 1 to 128						
delta: 1 unit						
. reg ROA NPL LQR OE IRR FOREX CAR LLP BS						
Source	SS	df	MS	Number of obs	=	128
Model	.006465435	8	.000808179	F(8, 119)	=	52.12
Residual	.001845306	119	.000015507	Prob > F	=	0.0000
Total	.00831074	127	.000065439	R-squared	=	0.7780
				Adj R-squared	=	0.7630
				Root MSE	=	.00394
ROA	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
NPL	-.0071953	.0159606	-0.45	0.653	-.0387988	.0244083
LQR	.0127774	.0050311	2.54	0.012	.0028154	.0227394
OE	-.0507303	.0044504	-11.40	0.000	-.0595425	-.0419181
IRR	.0068795	.0017389	3.96	0.000	.0034363	.0103228
FOREX	.0097955	.0031784	3.08	0.003	.0035019	.0160891
CAR	.0171222	.007464	2.29	0.024	.0023428	.0319017
LLP	-.0553019	.0430885	-1.28	0.202	-.1406214	.0300177
BS	-.0023342	.0006001	-3.89	0.000	-.0035224	-.001146
_cons	.0516237	.0051025	10.12	0.000	.0415202	.0617273
. dwstat						
Durbin-Watson d-statistic(9, 128) = 1.870362						

Annex III: Hausman test

```
. xtreg ROA NPL LQR OE IRR FOREX CAR LLP BS,fe
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Fixed-effects (within) regression

Group variable: CompanyCode

Number of obs = 128

Number of groups = 16

R-sq:

within = 0.7248

between = 0.8567

overall = 0.7720

Obs per group:

min = 8

avg = 8.0

max = 8

F(8,104) = 34.24

Prob > F = 0.0000

corr(u_i, Xb) = -0.4272

ROA	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
NPL	-.016458	.0164464	-1.00	0.319	-.0490718 .0161558
LQR	.0080915	.005427	1.49	0.139	-.0026704 .0188534
OE	-.0600804	.0051075	-11.76	0.000	-.0702087 -.0499521
IRR	.006017	.0019151	3.14	0.002	.0022192 .0098147
FOREX	.0138368	.003392	4.08	0.000	.0071103 .0205633
CAR	.0191027	.0110263	1.73	0.086	-.0027628 .0409682
LLP	-.0694086	.0476003	-1.46	0.148	-.1638018 .0249847
BS	-.0027635	.0006042	-4.57	0.000	-.0039616 -.0015654
_cons	.0600356	.0052915	11.35	0.000	.0495423 .0705288
sigma_u	.00250856				
sigma_e	.00350476				
rho	.33875897	(fraction of variance due to u_i)			

F test that all u_i=0: F(15, 104) = 3.08 Prob > F = 0.0004

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. estimate store fe
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. xtreg ROA NPL LQR OE IRR FOREX CAR LLP BS, re

Random-effects GLS regression              Number of obs   =       128
Group variable: CompanyCode                Number of groups  =        16

R-sq:                                     Obs per group:
    within = 0.7218                               min =          8
    between = 0.8666                             avg =         8.0
    overall = 0.7768                             max =          8

                                         Wald chi2(8)      =    363.48
corr(u_i, X)  = 0 (assumed)                Prob > chi2       =    0.0000

```

ROA	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
NPL	-.0103987	.015703	-0.66	0.508	-.041176	.0203786
LQR	.0107206	.005055	2.12	0.034	.0008129	.0206283
OE	-.0543639	.0045439	-11.96	0.000	-.0632699	-.045458
IRR	.0065955	.0017621	3.74	0.000	.0031418	.0100491
FOREX	.0109187	.0030783	3.55	0.000	.0048854	.016952
CAR	.0157625	.0082162	1.92	0.055	-.0003409	.0318659
LLP	-.0550838	.0432179	-1.27	0.202	-.1397893	.0296217
BS	-.0025071	.0005877	-4.27	0.000	-.0036589	-.0013552
_cons	.0553478	.0050625	10.93	0.000	.0454255	.06527
sigma_u	.00130079					
sigma_e	.00350476					
rho	.12107368	(fraction of variance due to u_i)				

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. estimate store re

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. hausman fe re				
	—— Coefficients ——			
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	fe	re	Difference	S.E.
NPL	-.016458	-.0103987	-.0060593	.0048887
LQR	.0080915	.0107206	-.0026291	.0019746
OE	-.0600804	-.0543639	-.0057164	.0023322
IRR	.006017	.0065955	-.0005785	.0007502
FOREX	.0138368	.0109187	.0029181	.0014248
CAR	.0191027	.0157625	.0033402	.0073534
LLP	-.0694086	-.0550838	-.0143247	.0199501
BS	-.0027635	-.0025071	-.0002564	.0001403
b = consistent under Ho and Ha; obtained from xtreg B = inconsistent under Ha, efficient under Ho; obtained from xtreg				
Test: Ho: difference in coefficients not systematic				
$\text{chi2}(8) = (b-B)' [(V_b-V_B)^{-1}] (b-B)$ $= 12.93$ Prob>chi2 = 0.1144 (V_b-V_B is not positive definite)				

Annex IV: Summary of Data Sets

Year	Company Code	ROA	NPL	LQR	OE	IRR	FOREX	CAR	LLP	BS
2017	AIB	0.028033	0.01868	0.231477	0.52609	0.96	0.230142	0.2	0.014606	4.622989
2018	AIB	0.030695	0.013323	0.24463	0.50043	0.89	0.262374	0.177279	0.008151	4.742475
2019	AIB	0.037562	0.017584	0.254307	0.437753	1.05	0.281895	0.176276	0.008611	4.872945
2020	AIB	0.031614	0.018827	0.331774	0.523439	1.46	0.314824	0.218874	0.017354	4.950793
2021	AIB	0.031156	0.012	0.277548	0.537877	1.03	0.391488	0.15656	0.017206	5.109564
2022	AIB	0.034229	0.0111	0.281973	0.541569	1.54	0.487818	0.145141	0.018179	5.263378
2023	AIB	0.034331	0.0153	0.239997	0.570971	1.52	0.535379	0.150837	0.015943	5.350295
2024	AIB	0.0343	0.0125	0.2865	0.636077	1.1	0.562371	0.176	0.0064	2.5
2017	DB	0.023927	0.025428	0.170774	0.607127	0.98	0.230142	0.26	0.020207	4.539385
2018	DB	0.023209	0.020706	0.17799	0.618583	0.95	0.262374	0.186481	0.009794	4.657299
2019	DB	0.020007	0.012396	0.123352	0.626799	1.09	0.281895	0.178208	0.006453	4.749879
2020	DB	0.024697	0.018677	0.145816	0.622874	1.06	0.314824	0.163383	0.002214	4.834175
2021	DB	0.021186	0.049	0.123775	0.589506	1.12	0.391488	0.110143	0.005371	4.976336
2022	DB	0.027422	0.0506	0.15	0.550737	1.08	0.487818	0.134557	0.007167	5.06872
2023	DB	0.027206	0.0737	0.18961	0.623193	1.01	0.535379	0.147556	0.010866	5.160291
2024	DB	0.0297	0.028	0.189311	0.654239	0.97	0.562371	0.14	0.017	5.26
2017	CBOO	0.014629	0.0352	0.213668	0.798509	1.19	0.280142	0.1	0.032181	4.248567
2018	CBOO	0.01845	0.0277	0.294784	0.689766	1.18	0.262374	0.101194	0.023527	4.475497
2019	CBOO	0.018353	0.0235	0.224257	0.713616	1.18	0.281895	0.19	0.034057	4.621081
2020	CBOO	0.025088	0.0222	0.144023	0.661032	0.62	0.314824	0.121584	0.028032	4.720064
2021	CBOO	0.019837	0.0203	0.22	0.717341	1.18	0.391488	0.111483	0.016578	4.910202
2022	CBOO	0.020879	0.086	0.335851	0.69599	1.06	0.487818	0.120646	0.015354	5.059207
2023	CBOO	0.02043	0.0344	0.297861	0.752481	1.43	0.535379	0.117779	0.021978	5.147139
2024	CBOO	0.0115	0.0255	0.342578	0.815272	1.32	0.562371	0.1127	0.038	5.14
2017	BOA	0.027059	0.013	0.152572	0.589291	1.1	0.230142	0.153	0.012631	4.403546
2018	BOA	0.019641	0.034801	0.161931	0.654753	0.93	0.262374	0.177707	0.011674	4.50492
2019	BOA	0.021802	0.04505	0.228911	0.631794	0.95	0.281895	0.171401	0.013219	4.594331
2020	BOA	0.017537	0.033078	0.139125	0.72263	0.94	0.314824	0.122546	0.012078	4.75504
2021	BOA	0.016697	0.022	0.36	0.726816	0.96	0.391488	0.108967	0.014687	5.016408
2022	BOA	0.025549	0.0192	0.245281	0.627149	0.98	0.487818	0.124464	0.015481	5.1745
2023	BOA	0.022851	0.0325	0.144248	0.684706	1.29	0.535379	0.0985	0.01853	5.277637
2024	BOA	0.0322	0.0231	0.165824	0.714525	1.23	0.562371	0.101	0.0233	2.35
2017	HB	0.019489	0.013227	0.164361	0.644843	1.14	0.230142	0.16	0.01237	4.340502
2018	HB	0.022976	0.018326	0.161494	0.618128	1.04	0.262374	0.149329	0.013006	4.447637
2019	HB	0.018402	0.011764	0.107167	0.63645	1.01	0.281895	0.145213	0.005149	4.553107
2020	HB	0.022591	0.0263	0.141495	0.630723	1.06	0.314824	0.157443	0.006808	4.633453
2021	HB	0.021326	0.028	0.097124	0.633392	1.14	0.391488	0.142634	0.009369	4.733149
2022	HB	0.017961	0.0297	0.10063	0.672726	1.42	0.487818	0.132497	0.019237	4.82872
2023	HB	0.030644	0.0331	0.109262	0.573819	1.5	0.535379	0.131943	0.016396	4.916891
2024	HB	0.024	0.0332	0.224176	0.662271	0.97	0.562371	0.1251	0.022	1.98
2017	WB	0.028658	0.129696	0.214529	0.577637	1.04	0.230142	0.22	0.013698	4.321167
2018	WB	0.032832	0.043819	0.188204	0.55039	1.08	0.262374	0.207389	0.017451	4.437606
2019	WB	0.021727	0.042214	0.327733	0.663098	0.89	0.281895	0.234283	0.021604	4.473779
2020	WB	0.024488	0.1	0.371272	0.661529	0.85	0.314824	0.195517	0.019609	4.581604
2021	WB	0.003257	0.1	0.23969	0.945466	0.84	0.391488	0.121888	0.045967	4.598305
2022	WB	0.013322	0.0416	0.313206	0.820276	0.81	0.487818	0.169261	0.044987	4.634696

Year	Company Code	ROA	NPL	LQR	OE	IRR	FOREX	CAR	LLP	BS
2023	WB	0.017055	0.0586	0.194491	0.760991	0.93	0.535379	0.159432	0.040758	4.728239
2024	WB	0.0261	0.0384	0.232167	0.754868	0.92	0.562371	0.1445	0.0433	4.82
2017	NIB	0.024065	0.039825	0.185224	0.51888	1.56	0.230142	0.16	0.016266	4.322627
2018	NIB	0.021434	0.021405	0.169771	0.590921	0.8	0.262374	0.17655	0.014982	4.426331
2019	NIB	0.023981	0.01	0.13414	0.562062	1.08	0.281895	0.171187	0.009772	4.527854
2020	NIB	0.02734	0.02	0.145503	0.538728	1.08	0.314824	0.179383	0.008418	4.628018
2021	NIB	0.025056	0.0245	0.15736	0.573455	1.1	0.391488	0.217411	0.007729	4.733993
2022	NIB	0.022984	0.0109	0.280672	0.607339	1.08	0.487818	0.163417	0.010948	4.788814
2023	NIB	0.021755	0.04	0.177071	0.651073	1.09	0.535379	0.15145	0.009943	4.886608
2024	NIB	0.0164	0.03	0.110555	0.813958	1.14	0.562371	0.171	0.016	1.83
2017	OIB	0.020916	0.040014	0.166574	0.675024	1.17	0.230142	0.1213	0.018641	4.211998
2018	OIB	0.036304	0.037864	0.29	0.512657	1.06	0.262374	0.081531	0.007869	4.376517
2019	OIB	0.026841	0.037199	0.19	0.581807	1.07	0.281895	0.079985	0.015569	4.502144
2020	OIB	0.026232	0.024964	0.20408	0.588478	1.06	0.314824	0.121979	0.013314	4.529321
2021	OIB	0.023091	0.0202	0.202311	0.638478	1.01	0.391488	0.102235	0.032173	4.620043
2022	OIB	0.025627	0.016	0.225024	0.630079	1.4	0.487818	0.210454	0.027546	4.71638
2023	OIB	0.026897	0.024	0.280638	0.661281	1.01	0.535379	0.152775	0.024652	4.815666
2024	OIB	0.0106	0.023	0.234976	0.842913	1.49	0.562371	0.14	0.0122	4.83
2017	LIB	0.028118	0.0337	0.278939	0.562418	0.67	0.230142	0.1704	0.020111	4.040441
2018	LIB	0.030896	0.0349	0.241293	0.556569	1.31	0.262374	0.1657	0.024759	4.155931
2019	LIB	0.031059	0.0365	0.380716	0.567483	1.27	0.281895	0.1492	0.019422	4.309451
2020	LIB	0.024652	0.03	0.245137	0.631832	1.15	0.314824	0.1242	0.024346	4.502189
2021	LIB	0.010457	0.1687	0.137358	0.820783	1.18	0.391488	0.1273	0.047936	4.507912
2022	LIB	0.008249	0.1895	0.134509	0.848515	1.11	0.487818	0.1231	0.063672	4.518157
2023	LIB	0.014281	0.1357	0.230654	0.698508	1.13	0.535379	0.1179	0.055868	4.551264
2024	LIB	0.0168	0.0911	0.167521	0.976549	1.18	0.562371	0.1118	0.0412	1.63
2017	BIB	0.024202	0.028	0.186897	0.604717	1.16	0.230142	0.21	0.016743	3.992112
2018	BIB	0.027605	0.0281	0.245753	0.574056	1.07	0.262374	0.198	0.014508	4.114649
2019	BIB	0.033535	0.0386	0.197003	0.551175	1.46	0.281895	0.2352	0.015925	4.161212
2020	BIB	0.026395	0.0464	0.128386	0.643311	1.55	0.314824	0.2138	0.017709	4.275706
2021	BIB	0.029927	0.024	0.15	0.608765	1.28	0.391488	0.1746	0.019482	4.414067
2022	BIB	0.029355	0.041	0.1142	0.632943	1.21	0.487818	0.1688	0.017806	4.5328
2023	BIB	0.023583	0.0348	0.193869	0.714141	1.23	0.535379	0.1681	0.017672	4.666474
2024	BIB	0.0184	0.0384	0.263822	0.769139	1.21	0.562371	0.1582	0.0202	4.74
2017	BB	0.037318	0.021	0.2	0.497054	1.26	0.230142	0.26	0.014418	4.020729
2018	BB	0.026701	0.03	0.235755	0.636474	1.65	0.262374	0.2	0.0173	4.148231
2019	BB	0.027553	0.0355	0.18671	0.636025	1.05	0.281895	0.17	0.017857	4.28268
2020	BB	0.027299	0.022	0.155909	0.651675	1.21	0.314824	0.17	0.015868	4.329505
2021	BB	0.008075	0.088	0.130633	0.861241	1.02	0.391488	0.18	0.042699	4.430057
2022	BB	0.015955	0.085	0.117272	0.801755	0.96	0.487818	0.2	0.055557	4.519364
2023	BB	0.013023	0.0575	0.310624	0.82463	1.15	0.535379	0.16	0.053476	4.653649
2024	BB	0.0147	0.0498	0.121581	0.819481	1.05	0.562371	0.18	0.0239	4.66
2017	ZB	0.029266	0.0378	0.365974	0.46947	0.86	0.230142	0.3	0.045556	3.985393
2018	ZB	0.024462	0.027771	0.377384	0.506734	0.89	0.262374	0.332404	0.032324	4.096533
2019	ZB	0.0356	0.019858	0.235246	0.395416	1.06	0.281895	0.36	0.02163	4.166993
2020	ZB	0.044546	0.0225	0.353405	0.356739	1.56	0.314824	0.27	0.017461	4.267075
2021	ZB	0.043654	0.0151	0.370897	0.389204	1.46	0.391488	0.346107	0.016108	4.40055

Year	Company Code	ROA	NPL	LQR	OE	IRR	FOREX	CAR	LLP	BS
2022	ZB	0.048988	0.0108	0.327773	0.363507	1.48	0.487818	0.347949	0.013587	4.545552
2023	ZB	0.04374	0.048	0.270526	0.426354	1.57	0.535379	0.2925	0.013594	4.679287
2024	ZB	0.0434	0.0216	0.33207	0.452122	1.67	0.562371	0.31	0.017	4.77
2017	AB	0.023409	0.033819	0.231117	0.604456	1.19	0.230142	0.178	0.01133	3.93914
2018	AB	0.030164	0.03084	0.17	0.56008	0.93	0.262374	0.194414	0.017367	4.090789
2019	AB	0.036571	0.019708	0.46	0.495028	0.95	0.281895	0.227241	0.014822	4.179158
2020	AB	0.028389	0.02048	0.392193	0.562032	0.93	0.314824	0.188724	0.011937	4.305432
2021	AB	0.033749	0.028	0.258607	0.530468	0.98	0.391488	0.15003	0.014669	4.477101
2022	AB	0.026403	0.0416	0.267563	0.591999	0.83	0.487818	0.159887	0.014378	4.609546
2023	AB	0.032405	0.029	0.318486	0.604996	0.93	0.535379	0.153511	0.015581	4.740821
2024	AB	0.0247	0.0375	0.20484	0.313723	0.81	0.562371	0.14	0.0135	4.82
2017	ADIB	0.031396	0.017	0.270431	0.591415	1.11	0.230142	0.21	0.012445	3.533343
2018	ADIB	0.029591	0.0205	0.312819	0.5803	0.9	0.262374	0.16	0.00896	3.624897
2019	ADIB	0.03273	0.046	0.301197	0.554773	1.15	0.281895	0.2	0.010794	3.741534
2020	ADIB	0.035503	0.029	0.228421	0.521014	0.95	0.314824	0.2	0.009136	3.812274
2021	ADIB	0.035307	0.033	0.209132	0.533547	0.87	0.391488	0.19	0.008848	3.948082
2022	ADIB	0.03508	0.032	0.207142	0.567663	1.06	0.487818	0.21	0.016682	4.032953
2023	ADIB	0.019106	0.0317	0.17147	0.734273	1.08	0.535379	0.19	0.014959	4.100522
2024	ADIB	0.0295	0.0374	0.185368	0.634322	1.01	0.562371	0.19	0.0182	4.19
2017	DGB	0.030317	0.029	0.42	0.648678	1.05	0.230142	0.29	0.016997	3.314478
2018	DGB	0.040061	0.0291	0.319888	0.582644	1.35	0.262374	0.33	0.017158	3.513309
2019	DGB	0.048173	0.0164	0.352258	0.484831	1.18	0.281895	0.3	0.020599	3.739375
2020	DGB	0.029932	0.0456	0.252266	0.716232	1.1	0.314824	0.35	0.009796	3.892795
2021	DGB	0.020052	0.0171	0.143257	0.780552	1.09	0.391488	0.26	0.010002	4.065522
2022	DGB	0.021557	0.0152	0.194378	0.716213	1.07	0.487818	0.18	0.014095	4.148776
2023	DGB	0.031759	0.0309	0.140779	0.63059	1.06	0.535379	0.15	0.008552	4.275403
2024	DGB	0.0246	0	0.159925	0.566042	0.96	0.562371	0.16	0.0106	4.38
2017	EB	0.023296	0.0065	0.275524	0.569642	0.82	0.230142	0.21	0.006288	3.685588
2018	EB	0.028044	0.0172	0.246949	0.506907	0.87	0.262374	0.22	0.006188	3.811734
2019	EB	0.025711	0.0198	0.221051	0.536405	0.86	0.281895	0.2	0.00767	3.963861
2020	EB	0.020481	0.028	0.259589	0.643493	0.845	0.314824	0.16	0.011796	4.047898
2021	EB	0.017813	0.0273	0.202876	0.634327	0.835	0.391488	0.22	0.012845	4.165047
2022	EB	0.01974	0.0392	0.304927	0.625841	0.84	0.487818	0.14	0.012086	4.235756
2023	EB	0.027177	0.0406	0.229474	0.630288	0.85	0.535379	0.15	0.01826	4.357898
2024	EB	0.02	0.0357	0.228793	0.673859	0.88	0.562371	0.1405	0.0164	4.43