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**Liquidity Risk and Its Effects on financial performance: A case
study of selected Ethiopian private commercial banks**

By

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APPROVAL SHEET

**Liquidity Risk and Its Effects on financial performance: A case study of
selected Ethiopian private commercial banks**

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DECLARATION

I declare that this thesis entitled “Liquidity Risk and Its Effects on financial performance: A case study of selected Ethiopian private commercial banks,” my original work, prepared under the guidance of Hawlet Ahmed (PHD.), and that all sources of materials used for the study have been duly acknowledged. I have produced it independently except for the guidance and suggestions of the research advisor.

This study has not been submitted for credit toward any degree at this or any other university. It is offered for the partial fulfilment of Master’s degree in corporate finance specialty in investment management.

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CERTIFICATE

This is to certify that the thesis entitled “Liquidity Risk and Its Effects on financial performance: A case study of selected Ethiopian private commercial banks”, submitted to Addis Ababa University School of commerce for the granting of the Degree of Master of corporate finance specialty in investment management and is a record of research work carried out by Bethlehem Mulatu, under my guidance and supervision.

Therefore, I certify that no portion of this thesis has been submitted for credit toward a degree or diploma at any other university or institution.

Advisor

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Date

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List of Tables

TABLE 1 LIST OF SELECTED BANKS.....	25
TABLE 2 EVALUATION OF RESEARCH VARIABLES AND ANTICIPATED SIGNS.....	27
TABLE 3 DESCRIPTIVE STATISTICS OF DEPENDENT AND INDEPENDENT VARIABLE	29
TABLE 4 HAUSMAN TEST	35
TABLE 5 MULTICOLLINEARITY TEST (SOURCE –STATA OUTPUT)	36
TABLE 6 SERIAL CORRELATION.....	38
TABLE 7 HETEROSCEDASTICITY TEST	38
TABLE 8 RESEARCHERS COMPUTATION THROUGH STATA 17	40
TABLE 9 HYPOTHESIS TESTING.....	43

List of Acronyms

AIB: Awash international bank

BOA: Bank of Abyssinia

BS: Bank size

BCBS: Basel Committee on Banking Supervision

COOP: Cooperative bank of Oromia

CAP: Capital Adequacy

DB: Dashen Bank

DMBs: Deposit Money Banks

GDP: Gross Domestic Product

IR: Inflation rate

JSE- Johannesburg Stock Exchange

LIB: Lion international bank

LONG: Loan growth

NBE: National bank of Ethiopia

ROA: Return on asset

ROE: Return on equity

ZB: Zemen bank

ABSTRACT

This study investigated the impact of liquidity risk on the profitability of Ethiopian private commercial banks. The financial system in Ethiopia heavily relies on banks, which face significant liquidity challenges due to limited external investment options, regulatory constraints, and broader macroeconomic conditions. Unexpected and volatile withdrawals, high concentration of deposits, and non-performing loans exacerbate this risk, potentially destabilizing the banking sector and undermining economic development. An explanatory research design and a quantitative research approach were employed to understand the relationships between independent variables and the dependent variable (profitability). Secondary data, specifically panel data from audited financial statements of ten private commercial banks spanning 2015 to 2024, were collected from the National Bank of Ethiopia (NBE). Macroeconomic indicators like GDP growth and inflation rates were also sourced from the NBE. Descriptive analyses, correlation, and regression analysis using a panel data model were used, with a Hausman test guiding the choice between fixed-effects and random effects models. The study found that capital adequacy, GDP growth rate, loan growth, and bank size had a positive and statistically significant impact on bank profitability. Conversely, non-performing loans and net interest margin had a statistically insignificant and significant negative impact on profitability respectively. Inflation, however, was not found to explain the profitability of Ethiopian private commercial banks. The study recommended that key factors company size, loan growth ratio, GDP growth rate, capital adequacy, and net interest margin influencing profitability require full attention from bank owners and management. Ethiopian private commercial banks should also adjust their strategies to consider internal and external environments and liquidity concerns from economic dynamics to improve management efficiency. Strengthening capital adequacy and mitigating the impact of non-performing loans are crucial for sustained profitability.

Key Words: capital adequacy, Bank size, Net interest margin, Loan growth ratio, and profitability

Table of Contents

APPROVAL SHEET	ii
DECLARATION	iii
CERTIFICATE	iv
ACKNOWLEDGMENT.....	v
List of Tables	vi
ABSTRACT.....	viii
Chapter one	1
Introduction	1
1.1 Background of the study	1
1.2 Problem Statement	3
1.3. Research Questions	4
1.4 Objectives of the Study	5
1.4.1 General objective of the study	5
1.4.2 The Specific objectives of the study are:.....	5
1.5 Hypotheses of the Study.....	5
1.6. Scope and Limitation of the study.....	6
1.7. Significance of the study	6
1.8. Organization of the study	6
Chapter Two.....	7
Literature Review.....	7

2.1 Theoretical literature review	7
2.1.1 Banks Liquidity Risk	7
2.1.2 Determinants of Bank Liquidity	8
2.1.3 Bank Specific Liquidity Determinants	9
2.1.4 Macroeconomic Liquidity Determinant	10
2.1.5 Bank Liquidity Management	11
2.1.6 Liquidity Management Theories	12
2.1.7 Banks profitability Determinants.....	13
2.1.8 Liquidity Management strategies	15
2.2 Empirical Literature Review	16
2.2.1 Related Empirical studies outside Ethiopia	16
2.2.2 Empirical studies in Ethiopia.....	18
2.2.3 Summary and Literature Gap	21
2.3 Conceptual Framework	21
Chapter Three.....	23
Research design and Methodology	23
3.1. Introduction	23
3.2. Description of the study area.....	23
3.3. Research design.....	23
3.4. Research Approach	24
3.5. Population and sampling techniques	24
3.6. Data Type and Source	25
3.7. Methods of Data Analysis	26

3.8 Descriptions and Measurement of Study Variables	26
3.9 Model Specification	27
CHAPTER FOUR.....	29
DATA PRESENTATION AND ANALYSIS	29
4.1 Descriptive statistics of the Findings	29
4.2 Correlation result analysis	32
4.3 Basic assumption, Model Selection and Diagnostics Tests	35
4.3.1 Hausman Test	35
4.3.2 Multicollinearity Test	36
4.3.3 Serial (Auto) correlation Test	37
4.3.4 Heteroscedasticity Test.....	38
4.4 Regression Analysis and Discussions	40
4.4.1 Bank Size	41
4.4.2 Non-performing Loan.....	41
4.4.3 Net interest margin	41
4.4.4 Capital Adequacy	42
4.4.5 Loan Growth.....	42
4.4.6 GDP Growth Rate	42
4.4.7 Inflation rate	43
4.5 Hypothesis Testing.....	43
CHAPTER FIVE	44
SUMMARY, CONCLUSION AND RECOMMENDATION	44
5.1 summary of findings.....	44

5.2 Conclusions	46
5.3 Recommendations	46
5.4 Future Direction of Research	48
References	49

Chapter one

Introduction

1.1 Background of the study

Financial organizations such as banks play a crucial role in the economy by transferring funds from economically strong to economically weaker entities. Banks can lend money, accept deposits, transfer money locally or internationally, and act as a paying agency (Simene, 2012). According to the NBE report (June 2024), there are 32 banks operating in Ethiopia, with private banks holding approximately 60% of the market share. Of these, DBE and CBE are state-owned, and the other 30 are privately owned.

In Ethiopia, the banking sector has seen significant growth due to heightened economic activity and an increasing need for financial services. The primary function of bank is liquidity creation however, it also a major source of vulnerability (Boubaker, 2020). Nonetheless, the sector encounters obstacles such as difficulties in attracting deposits, restricted lending capacity, insufficient infrastructure, and a shortage of market information. This decrease in bank liquidity has made it more difficult for banks to provide essential services to their customers (Enedale, 2021). This situation has hindered businesses from securing loans, which has hampered investment and economic development.

(Belete, 2015) defines liquidity as the ability of a bank to fund increases in assets and meet obligations as they come due without incurring unacceptable losses. Liquidity is a critical part of the risk management strategies of banks. A study of liquidity is important to both internal and external analysts because of its close relationship with the day-to-day operations of a business (Obilor, 2013). Banks must maintain the highest level of liquidity possible in order to optimize their profits and satisfy their obligations (BCBS, 2008). During periods of financial difficulty, banks might encounter a liquidity crisis, making it challenging for them to fulfill their short-term commitments.

Liquidity and profitability serve as indicators of the financial stability and health of the banking sector. Profitability is a measure of a firm's efficiency (Khan, 1998). (Weston, 1989) described

profitability as the net result of a large number of policies and decisions. A lack of liquidity leads to disruptions in the smooth functioning of the system and settlement failures, which reduces the efficiency and reliability of the payment system, affecting peer participants and their clients (NBE,2024).

For Ethiopian commercial banks, liquidity risk is a critical issue. Liquidity risk refers to the risk encountered by financial institutions in fulfilling short-term obligations due to insufficient cash or an inability to convert liquid assets to cash. Liquidity risk in private commercial banks in Ethiopia is characterized by an inadequate capital base, a high loan-to-deposit ratio, and limited diversification of assets (Alemayehu, 2018). The report by KPMG examines the liquidity risk faced by U.S. companies that went public in 2020 and 2021. A segment of these companies faces the potential of depleting their cash reserves within the next two years because of limited funding opportunities and substantial operating losses. The report examines the financial status of these businesses and outlines approaches such as debt restructuring, equity financing, and asset liquidation to alleviate their liquidity challenges.

Liquidity risk can occur due to a significant concentration of deposits and abrupt withdrawals by a small number of major depositors. Liquidity risk arises when the money supply cannot meet the demand for unexpected loans due to a lack of funds (Baral, 2005). Commercial banks that rely on a narrow range of deposits are at risk of facing liquidity problems. The disparity between assets and liabilities, along with funding shortfalls, contributes to liquidity risk within the banking industry. Banks face an asset-liability maturity mismatch when they collect short-term deposits and use them for long-term investments.

At the end of 2024, over half of the deposits in the banking sector were held by just 0.4% of depositors and state-owned enterprises. This indicates that the deposit concentration is a more significant issue among public sector entities than private ones. Consequently, certain banks may encounter liquidity shortages at the transaction level in real time. The high concentration of deposits combined with the disparity in maturity between deposits and loans results in liquidity risks for private commercial banks in Ethiopia.

(Blome, 2001) revealed that while problems with non-performing loans (NPLs) can impact all industries, financial institutions with large loan portfolios such as commercial banks and mortgage financing companies are the most severely affected. Furthermore, a bank's capacity to extend credit is hampered by a sizable NPL portfolio. Liquidity issues arise because a high level of non-performing loans may cause depositors and foreign investors to lose faith in the bank, which could lead to a bank run. The banking sector is expected to maintain a sound liquidity and profitability position. The report by NBE examines that the Ethiopian commercial banking sector is highly sensitive to liquidity risk and indicates that the banking industry had also become more sensitive by the end of June 2024 than in the previous year. This research aims to examine the liquidity problem in relation to profitability, focusing on the liquidity risk faced by private commercial banks in Ethiopia.

1.2 Problem Statement

Banks serve as essential financial intermediaries, commonly mobilizing deposits from savers and extending loans to borrowers, thereby facilitating the efficient allocation of resources and contributing to economic growth. In Ethiopia, the financial system predominantly relies on banks, and the capital market remains underdeveloped, making private commercial banks essential to the economy. However, these banks face significant liquidity risk due to limited external investment options, regulatory constraints, and broader macroeconomic conditions (IMF, 2024).

Liquidity risk, in particular, has emerged as an urgent concern within the Ethiopian banking sector. This risk is often triggered by unexpected and volatile withdrawals from depositors during periods of financial instability. Moreover, the high concentration of deposits among a few large depositors in addition exacerbates this risk. As stated by the (IMF, 2024), banks with concentrated deposits are more susceptible to liquidity shortages, impairing their ability to fulfill short-term obligations.

Another factor contributing to liquidity constraints is the prevalence of non-performing loans (NPLs). Banks with high NPL ratios experience decreased credit capacity and a lack of stakeholder confidence, potentially leading to liquidity crises. In the Ethiopian context, this problem is intensified through regulatory necessities. The national financial institution of Ethiopia mandates that private banks make investments 20% in their new disbursement of loans in NBE-bills with a

five-year maturity, which significantly reduces liquidity by locking funds into long-term instruments (Anon., 2024).

Demand for loans additionally influences liquidity. When loan demand is high, banks may reduce their liquid asset holdings in favor of long-term, higher-yield lending. While potentially profitable, this practice will increase liquidity risk and may pressure banks to borrow from financial institutions at high interest rates, raising operational costs and reducing profitability (Roba&legass, 2024). Although several studies have examined factors of liquidity and profitability in Ethiopia, the findings remain mixed and context-specific. Some studies found that liquidity risk significantly affects bank overall performance and emphasized the compounding effect of NBE bill requirements and asset-liability mismatches. However, these studies often focused on limited periods or precise banks, and do not comprehensively explore the connection between liquidity risk and profitability throughout current years.

Given the evolving regulatory environment and the growing complexity of financial operations, a deeper and more up-to-date research is essential. The per period om 2016 to 2024 has seen significant change in economic policy and banking practices, making it an essential window for analysis. If liquidity risks aren't properly understood and managed, they may destabilize the banking sector and undermine its capacity to support economic development (IMF, 2024).Therefore, this study aims to investigate the impact of liquidity risk on the profitability of Ethiopian private commercial banks. It will do so by considering the recent macroeconomic and bank-specific environments and providing timely insights that enhance the current body of literature, while also offering actionable recommendations for policymakers and financial institutions.

1.3. Research Questions

1. How is the financial performance (ROA) of Ethiopian private commercial banks affected by liquidity risk?
2. How do bank specific factors influence Ethiopian private commercial bank's profitability?

3. How do Ethiopian private commercial bank's profitability impact by external factors (GDP and Inflation)?

1.4 Objectives of the Study

1.4.1 General objective of the study

The general objective of this study is to examine the effect of liquidity risk on the profitability of private commercial banks in Ethiopia.

1.4.2 The Specific objectives of the study are:

1. To investigate how financial performance (ROA) of Ethiopian private commercial banks affected by liquidity risk.
2. To examine bank-specific elements that influence Ethiopian private commercial banks' profitability.
3. To investigate how Ethiopian private commercial banks' profitability is impacted by external factors (GDP and Inflation).

1.5 Hypotheses of the Study

H1: Bank size has a significant effect on the profitability of private commercial banks in Ethiopia.

H2: Non performing loan has a significant effect on the profitability of private commercial banks in Ethiopia.

H3: Net interest margin has a significant effect on the profitability of private commercial banks in Ethiopia.

H4: Capital adequacy has a significant effect on the liquidity risk of private commercial banks in Ethiopia.

H5: Loan growth has a significant effect on the liquidity risk of private commercial banks in Ethiopia.

H6: GDP growth has a significant effect on the liquidity risk of private commercial banks in Ethiopia.

H7: Inflation has a significant effect on the liquidity risk of private commercial banks in Ethiopia.

1.6. Scope and Limitation of the study

The study focused on ten private commercial banks in Ethiopia, each with at least ten years of operational experience and registered with the National Bank of Ethiopia (NBE). This specific selection allowed the researchers to thoroughly investigate how liquidity risk affected profitability within these established financial institutions. To achieve this, the study utilized 10 years of audited financial statements, covering the period from 2015 to 2024. This extensive dataset provided a robust foundation for analyzing the relationship between liquidity risk and profitability over time. The study uses quantitative research approach to examine liquidity risk indicators and their effects on financial performance by using financial reports.

1.7. Significance of the study

The study identifies and draws conclusions about the effect liquidity risk on profitability of Ethiopian private commercial banks. The study had vital significance to show the bank-specific, industry - specific and macroeconomic determinants in what extent they affected the profitability of the commercial banks. It provides an opportunity to gain further awareness about variables which determines the liquidity of commercial banks in Ethiopia to all interesting stake holders in the area. The study can be used as a reference for commercial banks, regulatory bodies and the academic staff to focus and control over the variables that bring negative effects on liquidity and its impact on profitability.

1.8. Organization of the study

This study was structured into five chapters. The first chapter introduced the background of the study, outlined the problem statement, presented the hypothesis, and defined the research objectives, questions, and scope. In the second chapter, the study reviewed relevant literature, examining key theories and prior research. The third chapter detailed the methodology, explaining how the study was conducted. Next, the fourth chapter analyzed the data and discussed the findings. Finally, the fifth chapter brought everything together summarizing the key insights, drawing conclusions, and offering recommendations for future research or practice.

Chapter Two

Literature Review

2.1 Theoretical literature review

Financial institutions play an essential role in the economy of every nation. They serve as principal middlemen between persons possessing excess funds and others requiring capital for investments, including individuals and enterprises. (Moore, 2009) outlined that "a bank needs to hold liquid assets to meet the cash requirements of its customer. (Diamond, 1986) discussed that banks act as delegated monitors and ensure that firms use the resources allocated to them effectively. According to the theory of financial intermediation, one of the important roles that banks play in the economy is to provide liquidity by funding long term, illiquid assets with short term, liquid liabilities.

The degree to which a person or organization has cash on hand or assets that can be quickly turned into cash to meet short-term and immediate financial obligations is known as liquidity. The ability of a bank also refers to the ability to finance asset development and meet commitments as they fall due without suffering large losses

Liquidity risk arises from the fundamental role of banks in converting short-term deposits into long-term loans. Bank liquidity refers to a bank's ability to provide funds quickly and reasonably to fulfill its financial obligations or meet maturing commitments. According to (Zawadi, 2013) liquidity indicates the ability of the bank to meet its financial obligations in a timely and effective manner.

2.1.1 Banks Liquidity Risk

Liquidity risk refers to the challenge of ensuring enough liquidity to fulfill short-term obligations and other financial responsibilities. The risk that a bank may not have sufficient liquidity to meet its short-term obligation, which can lead to liquidity crises (Achary, 2013). For example, During the global financial crisis of 2007-2008, many banks and financial institutions had granted

substantial credit to subprime borrowers, who ultimately could not afford the mortgages they signed for. Due to these borrowers defaulting on their loans, banks faced significant financial losses. Many banks faced liquidity risk due to the collapse of the subprime mortgage market, leading to a sharp decline in asset value and resulting liquidity crises (Achary, 2013).

Liquidity risk in Ethiopian private commercial banks can stem from several reasons, including the government's requirement to buy government bonds and Treasury bills. This obligation to invest in government securities can limit the banks' capacity to lend and invest in more profitable opportunities. Maintaining a substantial quantity of Treasury bills can lessen the necessity for short-term borrowing in the interbank market. Treasury bill affects interbank liquidity and cost of borrowing (Krishanmurthy, 2012). Inflation increases the opportunity cost of holding liquidity and thus distorts the allocation of resources which require liquidity in transaction Central banks care about the welfare effects of changing the inflation target (Huybens, 1999). High inflation rate both domestically and internationally pose a further risk on the liquidity position of private commercial banks.

Liquidity risk presents a major challenge for the banking industry, as it enables banks to meet their financial obligations in both the short and long term. A bank's liquidity is crucial because it needs to have sufficient cash or other readily available assets to satisfy its commitments. The banking sector is a pivotal component of the economy, largely because economic intermediation relies significantly on banks. In performing this intermediation role, banks are subject to risks associated with liquidity. The primary function of bank is liquidity creation however, it also a major source of vulnerability. (Moussa & Boubaker, 2020).

2.1.2 Determinants of Bank Liquidity

Liquidity determinants are the elements that influence the ease with which an asset or security can be converted into cash without significantly impacting its price. These elements can vary across different markets and industries. The determinants of banks liquidity can be classified as Bank specific (unsystematic) determinant and macroeconomic (systematic) determinants of liquidity (Kinfe, 2019).

2.1.3 Bank Specific Liquidity Determinants

Bank specific liquidity determinants are internal factors that impact a bank's capacity to fulfill its short-term financial commitments and effectively manage liquidity.

Loan growth: The rise in the volume of loans that a bank provides to borrowers signifies growth in lending. A robust and consistent deposit foundation enhances both the capacity for lending and the liquidity of banks. According (Vodova, 2013) on liquidity of Hungary and Slovakia commercial banks and its determinants result shows that loan growth lower banks liquidity so liquidity risk increases with loan growth. Since loan is long term illiquid asset, increasing loan growth means holding large amount of illiquid asset in the loan portfolio of banks.

Capital adequacy: It assesses the adequacy of funds available to commercial banks for fulfilling their financial obligations and maintaining stability and confidence among shareholders. As (Richard, 2001) definition capital adequacy is the sufficient fund to absorb losses to protect depositors, creditors, and official institutions in the interest of maintaining banking system stability. Capital adequacy ratio is represented by the proportion of total contribution of the owners to risk asset.

Non-performing Loans: Non-performing loans refer to those where borrowers are not making scheduled payments on interest or principal. This scenario leads to reduced cash flow for banks and financial institutions, which may hinder their ability to lend to other customers and thus restrict liquidity. Any loan that is not up to date with regard to the repayment of both principal and interest, in breach of the terms of the loan agreement, is classified as non-performing. Non-performing loans are loans that are outstanding in both principal and interest for a long time contrary to the terms and conditions contained in the loan contract (Afza & Nazir, 2009). Therefore, the amount of non-performing loan measures the quality of bank assets (Chakraborty, 2008). The loan amount recorded as nonperforming should be the gross value of the loan as recorded on the balance sheet.

Bank size: It assesses the total ability of banks to perform the intermediary role. There will be an argument concerning to the size of bank, „too big to fail“ argument which indicated that large banks would benefit from an implicit guarantee, thus decrease their cost of funding and allows them to invest in riskier assets (Iannotta, 2007). (Vento, 2009), Large banks' "too big to fail" status

may encourage moral hazard behavior and excessive exposure to liquidity risk because it lowers funding costs and permits them to invest in riskier assets through implicit guarantees.

Asset quality: The quality of assets is a crucial element that influences the financial stability and efficiency of banks. A deterioration in asset quality can result in a heavy dependence on short-term borrowing, which subsequently decreases market liquidity. This connection leads to market disruptions and underscores the dangers of maturity mismatches. This indicates that a high asset quality ratio indicates that loans account for a large portion of the bank's assets, and that banks' performance will be impacted when loans default (Rahel, 2014).

Net interest Margin (NIM): The interest rate margin is the sum of interest paid by borrowers that forces liquidity holders to give up their funds. The liquidity preference hypothesis states that in order for lenders to make loans, they must offer high interest rates, which include the interest rate margin and liquidity premium. This theory's fundamental premise is that whereas borrowers often choose long-term loans, lenders of funds prefer short-term loans. Banks will be forced to lend more and maintain fewer liquid assets if interest rates and liquidity premiums rise. The difference between a borrower's gross cost to a bank and a depositor's net return is known as the interest rate margin (Brock, 2000). Net interest income is divided by total assets to determine the Net Interest Margin (NIM). It can also be calculated by dividing net interest income by the average amount of assets that generate interest.

2.1.4 Macroeconomic Liquidity Determinant

The economic and legal environment that influences an institution's operations and liquidity is indicated by external or macro determinants, which are elements unrelated to bank management. A bank's liquidity may be impacted by factors such as the inflation rate and GDP growth rate.

Inflation: Bank liquidity risk is impacted by changes in the inflation rate. (Oner, 2010) Inflation can be defined as the rate at which prices rise over a specific time period. In order to increase interest income, banks frequently choose to hold more illiquid assets as inflation rates rise. In response to a heightened percentage change in inflation, banks are more likely to issue loans to benefit from elevated interest rates. Depositors are inclined to invest in illiquid assets rather than

keeping their funds in bank accounts to safeguard against the erosion of their money's value. Consequently, banks receive fewer deposits, resulting in an increase in their financing shortfalls.

GDP Growth: s an important measure of a nation's economic performance. It reflects the pace at which a country's economic output is growing or shrinking over time. (Siaw, 2013) research suggests that GDP is the annual percentage change in GDP is a crucial macroeconomic indicator that affects a financial institution's profitability in any given economy. The change in GDP percentage from one-time frame to the next indicates the growth of a country's GDP. GDP serves as a macroeconomic element that influences the liquidity of banks. For which, Significant business operations problems or recessions impair borrowers' capacity to repay debts, which raises bank non-performing loans and ultimately leads to bank collapse,(Gavin & Hausmann, 1998).

2.1.5 Bank Liquidity Management

Commercial banks are institutions focused on generating profits that act as intermediaries between those in need of funds and those who have surplus money to lend. They collect temporarily available funds from both individuals and businesses and offer loans to those who require financial support. In this role, Banks are subject to a variety of hazards in the course of their business since they oversee the money of both individuals and different organizations. Consequently, risk is characterized as the potential for loss and is a crucial factor in any business's decision-making process.

It is true that firms must prioritize liquidity management, particularly in light of shifting financial and economic conditions. A corporation that practices effective liquidity management is able to pursue long-term growth goals while simultaneously meeting its short-term obligations. (Olin.J, 2001) explains that liquidity is the danger of not having enough cash and promptly sellable securities on hand to meet depositors' immediate obligations, particularly in times of economic hardship. Therefore, a bank may fail if it lacks the necessary money and liquidity to meet its obligations.

Effective liquidity management is essential to a business's financial health, which can subsequently boost the owner's equity or net worth. This is accomplished by managing cash flow effectively,

making certain that earnings are wisely reinvested while also delivering returns to shareholders. Maintaining working capital's liquidity in daily operations is essential to ensuring that it runs smoothly and fulfills its obligations (Eljelly, 2004).

2.1.6 Liquidity Management Theories

Several theories and frameworks have been developed to understand and manage liquidity effectively. Here are some key theories related to liquidity management:

Commercial Loan Theory: Claims that commercial banks can guarantee its liquidity by holding a collection of short-term loans, which can be turned into cash via standard business activities. As per (Machiraju, 2003) According to commercial loan theory, as long as assets are held in short-term loans that will be repaid in the regular course of business, commercial banks' liquidity will be guaranteed.

According to the theory, a commercial bank can preserve its liquidity by overseeing a group of short-term loans that can be quickly converted into cash through routine company operations. Furthermore, it assumes that the repayment from self-liquidating assets will sufficiently sustain liquidity. Nevertheless, this viewpoint fails to consider the possible adverse effects of seasonal deposit withdrawals and the necessity to accommodate credit demands on the liquidity position of the bank. As per (Botoe, 2011) This theory's fundamental premise is that short-term business loans will be preferred since they will be paid back with profits from the business deal, they were used to support.

Shift ability theory: It implies that by keeping liquidity reserves in credit instruments that are readily marketable in a secondary market, banks can successfully guard against significant deposit withdrawals. The notion that bank loans' ultimate liquidity depends on their ability to be shifted to the Federal Reserve Banks was added to the shift ability theory. According to (Machiraju, 2003), Shift ability theory is predicated on the idea that the assets held by the bank may either be transferred to the central bank, which is prepared to buy assets at a discount, or sold to other lenders or investors.

Anticipated income theory: According to the notion, rather of relying on collateral, liquidity can be attained by setting up loan repayments according to the borrower's projected future earnings. This idea emphasizes how the borrower's income and loan payments are related. It also suggests that a bank's liabilities may be impacted by the maturity composition of its loan and investment portfolio. (Botoe, 2011) Connect the projected income theory to term loans, which will become more and more significant, with suitable payback plans tailored to the borrower's expected income or cash flow. He explains how this banking policy structure will effectively meet company credit demands and allow for the unrestricted usage of loan commitments. According to this theory, a bank can efficiently manage its liquidity by appropriately planning and arranging the loan commitments it extends to clients. In this situation, if borrowers' repayment plans match their expected future conditions, liquidity can be maximized.

Liability Management Theory: According to the liability management hypothesis, banks might actively borrow money from the financial markets to cover loan disbursements and deposit withdrawals in order to satisfy their liquidity requirements. This strategy initially gained popularity in significant money markets before spreading throughout the American banking industry. Its roots are in the federal funds market's resurgence in the 1980s and the expanding usage of negotiable time deposits as important money market vehicles. In reality, U.S. banks frequently use the sale of loan participation certificates, the federal funds market, or the Eurodollar market to get liquidity. Liability management is the name given to this tactic over time (Mugenyah, 2015). In light of this, the anticipated income theory and the commercial loan theory are especially pertinent frameworks for study when looking at liquidity risk and how it affects financial performance.

2.1.7 Banks profitability Determinants

The survival, expansion, and existence of a business largely rely on the profits it can generate. It is indeed the case that an increase in profitability can significantly enhance shareholder value. Profitability indicates the capacity of a business organization to sustain its profits consistently over time. The nation's economic growth will undoubtedly be influenced by the organization's profitability. Commercial banks become profitable when their revenue exceeds their expenses and taxes. The fees they charge for services and the interest they receive on their asset accounts are their main sources of income. On the other hand, their biggest expense is interest paid on

obligations. Loans make up the majority of a bank's assets and generate the majority of its operational revenue. Most banks' portfolios are dominated by loans, which make up between 50 and 70 percent of total assets (Claudiu & Daniela, 2009).

To figure out if a bank is on solid ground and can meet its financial commitments, analysts take a good look at its financial health. They compare the bank's easily accessible funds and short-term investments against the debts it needs to pay off soon. The main method for this is looking at a 'snapshot' of these figures. For commercial banks, the most well-known and frequently used tool for this health check is the 'loan-to-deposit ratio' – which, in plain terms, shows how much of the money people have deposited is then loaned out by the bank

Loan to deposit ratio: The loan to deposit ratio is the most widely used and standard statistic, according to (Choudhry, 2011). It evaluates the relationship between consumer deposits and lending operations as well as the bank's capacity to maintain its financial stability. However, it fails to project future results or consider factors like the duration, volatility and concentration of funds. The bank either has a sizable loan portfolio or depends on non-deposit or acquired money to support its assets if the loan-to-deposit ratio is high. Managing liquidity within banks involves ensuring that sufficient liquid assets are available to meet the obligations owed to depositors. Banks that maintain liquidity, as well as those with higher loan exposure, generally experience greater growth in deposits.

Return on Assets (ROA): It is a ratio of total assets to income. It assesses how well the company's management can use its available assets to create revenue. It demonstrates how well the business uses its resources to produce revenue. A greater return on asset indicates that the business is making better use of its resources. A healthy and successful banking industry helps maintain the stability of the financial system and is more resilient to adverse shocks (Athanasoglou, n.d.). Banks' maximum profit potential and interest income increase with the volume of loans and advances they give their customers, but this can also affect the bank's liquidity. Consequently, banks need to strike a balance between liquidity and profitability.

Return on Equity (ROE): Return on equity assesses how profitable a business is in relation to the equity held by its shareholders. It shows how well management is generating profit from the

company's assets. Net income or profit after taxes is divided by the entire amount of common stock equity to get return on equity, or ROE. Another way to figure it out is to divide net income by the average amount of equity in common stock. However, (Sufian, 2011) measured ROE by dividing net income by average total common stock equity. The ability of a business to generate profits for each unit of shareholders' equity is indicated by a greater ROE. Because it indicates sound financial standing and competent management, investors typically seek out businesses with a steady and high return on equity.

2.1.8 Liquidity Management strategies

According to (Rose, 1999) There are three main approaches to addressing the issue of bank liquidity. The following are some tactics that seasoned liquidity managers have created to address liquidity issues:

Asset Liquidity Management (Asset Conversion) strategy the strategy involves providing liquidity through assets and highlights the significance of ensuring liquidity by primarily maintaining cash and assets that can be easily traded. The goal of the asset conversion strategy is to maintain liquidity in assets, primarily cash and marketable securities, so that they can be quickly converted into cash as needed to meet all obligations. This approach is usually used by small banks since it is thought to be a less hazardous way to manage liquidity than borrowing. Nevertheless, this approach has drawbacks because retaining liquidity in assets that must be sold has an opportunity cost.

Borrowed Liquidity Management (Liability) strategy The biggest banks in the sector have begun to borrow more money from the money market to acquire a larger percentage of their liquid assets. All anticipated liquidity needs are satisfied with the help of these borrowed cash. This approach involves acquiring immediately available funds to address all expected demands for liquidity. In contrast to holding liquid assets, this method involves borrowing liquid assets only when funds are actually required. However, there is a tendency for money market interest rates to fluctuate, along with the swift changes in credit availability.

Balanced Liquidity Management Strategy It entails keeping a segment of the anticipated liquidity demands in assets while securing other expected liquidity needs through pre-arranged lines of credit with correspondent banks or potential fund suppliers. Most banks choose a hybrid approach to their liquidity management strategy, combining asset management and liability management, due to the hazards of relying on borrowed liquidity and the costs of storing liquidity in assets.

2.2 Empirical Literature Review

2.2.1 Related Empirical studies outside Ethiopia

(Charmier, et al., 2018), Their research established the effect of liquidity, namely bank liquidity, on the performance of Ghanaian commercial banks. The amount, direction, and effect of bank liquidity on the profitability of Ghanaian commercial banks were all investigated in this study. Using data organized as a panel, the study will be based on a sample of 21 banks during a ten-year period from 2007 to 2016. Descriptive statistics, regression analysis, and correlation analysis will all be used to examine the data. According to the findings, commercial banks' average liquid asset to total asset ratio is 20%, and their liquid asset cover of all interest-bearing liabilities is 1.19. The results show a favorable relationship between liquidity and return on assets using both bank liquidity measurements. There is a somewhat positive link between return on equity and the ratios of liquid assets to total assets. Total interest-bearing liabilities, return on equity (ROE), and liquid assets will all have a slight negative correlation. The study found that net interest margin, bank size, capital adequacy ratio, foreign ownership, and bank profitability were positively correlated with the control variables. According to the study, banks must have a specific optimal level of liquid assets in order to increase profitability. Banks should therefore ascertain the liquidity threshold that will lower profitability.

(Adesina & Olatise, 2020) This study looked at how the performance of the ten (10) manufacturing companies that were chosen for the five-year period 2012–2016 was affected by their liquidity management. The yearly accounts and reports of these companies will be the source of secondary data. The data will be analyzed using regression, correlation, and descriptive statistics. The study found that whereas quick and cash ratios have a positive but negligible link with ROA, current

ratios have a negative and significant impact on the profitability (ROA) of the chosen enterprises. Therefore, it is advised that in order to increase the profitability of Nigerian manufacturing companies, special attention be given to liquidity management.

(LiMei, et al., 2020) , Imagine trying to figure out what makes banks more or less profitable. That's what this study did for commercial banks in South Africa, specifically looking at how credit risk (like the danger of loans not being repaid), operational hiccups, and liquidity risk (the risk of not having enough ready cash) play a role. The researchers gathered data from banks listed on the Johannesburg Stock Exchange (JSE) for the years 2012 to 2018 and used a sophisticated analysis tool (Smart PLS-SEM) to connect the dots. So, what did they find? Interestingly, both credit risk factors (like the amount of bad loans, the bank's capital buffer, and loan costs) and liquidity risk factors (like how much quick cash the bank has) were clearly and positively tied to the banks' profitability (measured by standard indicators like ROA, ROE, and NIM). This means that managing these risks effectively seems to go hand-in-hand with better profits. The takeaway advice for the banks was to be proactive in managing their operational risks. This includes smart moves like spreading out their investments to boost returns, tightening up their internal and external operations, and possibly being more cautious about how quickly they increase their lending."

(Moore, 2010) Researchers wanted to understand what happens to banks' cash reserves in Latin America and the Caribbean when a financial crisis hits. They were curious about how the banks' ability to meet immediate demands (their 'liquidity') changes during these tough times. The study aimed to pinpoint the main things that influence bank liquidity and to see if the way banks manage their cash during a crisis actually makes sense given the overall economic situation. Using a common statistical method (regression analysis), they found some key things. For instance, big swings in the ratio of cash banks hold compared to deposits, and changes in short-term money market interest rates, both had a strong negative impact on liquidity – meaning as these went up, liquidity tended to go down. Interestingly, in about half the countries they looked at, bank liquidity moved in the opposite direction to the general economy. This suggests that when the economy was doing poorly, banks often got extra cautious and held onto more spare cash than usual.

The study conducted by (Haliru, et al., 2024) sought to investigate how liquidity management affected the financial performance of quoted Deposit Money Banks (DMBs) in Nigeria. It also examined how the capital adequacy, operational cost, and current ratios affected the return on assets of Nigerian listed DMBs. The study will be conducted using an ex post facto research design. The 2011–2020 timeframe was the focus of the investigation. The information will be gathered from each of the twelve (12) Nigerian deposit money banks' individual financial reports. Ordinary least square regression analysis will be used to examine the panel data, and the results will demonstrate that the capital adequacy ratio and operational cost ratio significantly increased return on assets. To lower credit risk and make sure they are safeguarded against non-performing loans, the report advised banks to maintain their capital sufficiency. As a result, banks with adequate capital have less bad credit and are therefore more profitable.

2.2.2 Empirical studies in Ethiopia

Various scholars in Ethiopia will carry out some connected investigations. In particular, (Soliyana, 2021) The goal of the study was to evaluate how liquidity affected the financial performance of a few Ethiopian private banks. Examining the impact of liquidity on the financial performance of particular private commercial banks is the primary goal of this study. Eight banks in total will be specifically chosen based on their operational duration as a selection criterion, and the annual audited financial report covering the years 2010–2019 will be examined using an explanatory research design, multiple linear regression analysis, and Pearson correlation. The results of this study demonstrate that liquidity indicators have a statistically significant impact on the financial performance of a subset of private commercial banks. ROA and ROE are the dependent variables in this study, while liquidity risk, market concentration, capitalization, asset quality, operational efficiency, and inflation are the independent variables. According to the study, all commercial banks must maintain an optimal level of liquidity in order to thrive in the industry. They can do this by strengthening their capital structure by going after very good capital adequacy management, developing sound asset quality management by applying good follow-up on loan structures, and creating strong follow-up that helps them maximize their operational efficiency by controlling costs and maintaining the desired profit even in unexpected circumstances. Since the

banking industry's existence, survival, and profitability depend on maintaining the desired and greatest level of liquidity under all circumstances,

(Kinfu, 2019) conducted a study on factors determining liquidity risk and the purpose of this study is to identify the factors that influence liquidity risk in private commercial banks in Ethiopia. Based on an empirical examination of the literature, the paper finds certain macroeconomic and bank-specific factors that affect the liquidity risk of private commercial banks in Ethiopia. Thirteen private commercial banks' financial statements from 2000 to 2017 were sampled for the study using unbalanced panel data. According to the report, the main factors influencing liquidity risk in Ethiopian private commercial banks between 2000 and 2017 will be loan growth, return on asset, loan growth, operational inefficiencies, lending interest rates, and money supply growth. Therefore, concentrating on these indicators and taking the appropriate action could lower the likelihood of liquidity risk in Ethiopian private commercial banks.

Conversely, (Yared, 2021), The ratio of non-interest expense to total revenue had a negative and substantial impact, while capital adequacy (CAP), GDP, and inflation rate had positive and significant effects. However, the analysis demonstrates that the loan to deposit ratio and the current asset to total asset ratio have a slight but favorable impact on banks' liquidity. Furthermore, there was an inverse link and negligible impact on the ROA of the chosen commercial banks between the liquid asset to deposit ratio and the liquid assets to net current liabilities ratio (Quick ratio). The study uses a quantitative approach and analyzes panel data from thirteen banks from 2000 to 2017 (Kinfu, 2019). The study comes to the conclusion that the liquidity risk of Ethiopian commercial banks is greatly influenced by both macroeconomic and bank-specific factors.

(Eyob, 2019) examined how Ethiopian commercial banks' financial performance is affected by liquidity risk. Examining how liquidity risk affects Ethiopian commercial banks' financial performance is the goal of this study. In balance Nine commercial banks' data for the sampled covered period from 2007 to 2016 will be subjected to fixed effect panel regression, along with secondary data. The study chooses and examines eight elements that impact Ethiopian commercial banks' financial performance. According to the results of panel data regression analysis, the financial performance of Ethiopian commercial banks was negatively and statistically significantly impacted by the liquidity coverage ratio, net stable funding ratio, loan to deposit ratio, and non-

performing loans. The cash reserve ratio, the percentage of nonperforming loans compared to total bank loans, the CPI, and the GDP growth rate all had negative but statistically negligible effects on Ethiopian commercial banks' financial performance throughout the test period. As a result, Ethiopian commercial banks' financial performance will be adversely affected by liquidity risk. Lastly, the study suggests that in order to make a lot of money, a bank's management should put its tied-up deposits and money on the market in the form of loans or other investments. They should also create new credit products such as consumer loans, mortgage loans, vehicle loans, and employee loans.

(Fanos, 2020) examine the effects of NBE regulations on Ethiopia's private commercial banks' profitability and liquidity. The thesis uses a quantitative approach, employing multiple linear regression models on panel data from seven private commercial banks between 2008 and 2017. Key regulatory variables analyzed include capital adequacy, reserve requirements, and NBE bill purchase requirements. According to the study, reserve requirements have a favorable effect on liquidity, while capital adequacy has a negative impact on profitability. The consequences of other regulations are negligible. Seven private commercial banks in Ethiopia were chosen as the study's limited sample because they are older than the other banks and are therefore likely to have more expertise managing liquidity issues and optimizing profitability. But it's possible that the study's conclusions won't apply to other private commercial banks.

(Berhanu, 2021) conducted a study on the effect of liquidity risk on the financial performance of nine Ethiopian private commercial banks from 2011 to 2019 found that liquidity risk positively affected their financial performance. Using a descriptive research design and quantitative approach with panel data analysis, the study measured financial performance by Return on Asset (ROA). It revealed that financing gap ratio, liquid asset to total asset ratio, cash reserve ratio, and bank size had a statistically significant impact on ROA, with all but bank size showing a positive relationship. While total loan to total asset ratio and GDP growth rate had a positive relationship, their impact was not statistically significant. The study concluded that banks should maintain sufficient liquidity, monitor asset quality, and identify optimal liquid asset holdings by balancing costs and benefits

2.2.3 Summary and Literature Gap

Liquidity is essential for all businesses, particularly in the banking sector, where the primary goal is to generate liquidity on both the asset and liability sides of financial statements, according to the theoretical and empirical analysis that has been presented. Additionally, studies show that a variety of factors, including the bank's distinctive characteristics, general macroeconomic conditions, and regulatory restrictions, can influence a bank's liquidity.

The global financial crisis that began in the middle of 2007 brought to light how important liquidity is to the functioning of the banking sector and financial markets. The financial crisis showed how quickly liquidity may be depleted and how long a shortage of liquidity can last. Extreme pressure on the banking industry led central banks to step in and support money market activities as well as, in certain cases, individual institutions.

Although several aspects of liquidity and liquidity management have been studied in the past, there are still gaps in our understanding of these issues, especially in light of recent market developments, regulatory changes, and economic upheavals. The relationship between liquidity and profitability was the subject of conflicting research; some studies found a positive correlation, while others found no association at all. Numerous studies have looked at macroeconomic and bank-specific factors that affect the liquidity of commercial banks, but they frequently failed to include the effects of recent regulatory changes and economic conditions. By examining the ways in which liquidity issues affected Ethiopian commercial banks' financial performance and taking into account the country's changing economic environment, this study sought to close such disparities.

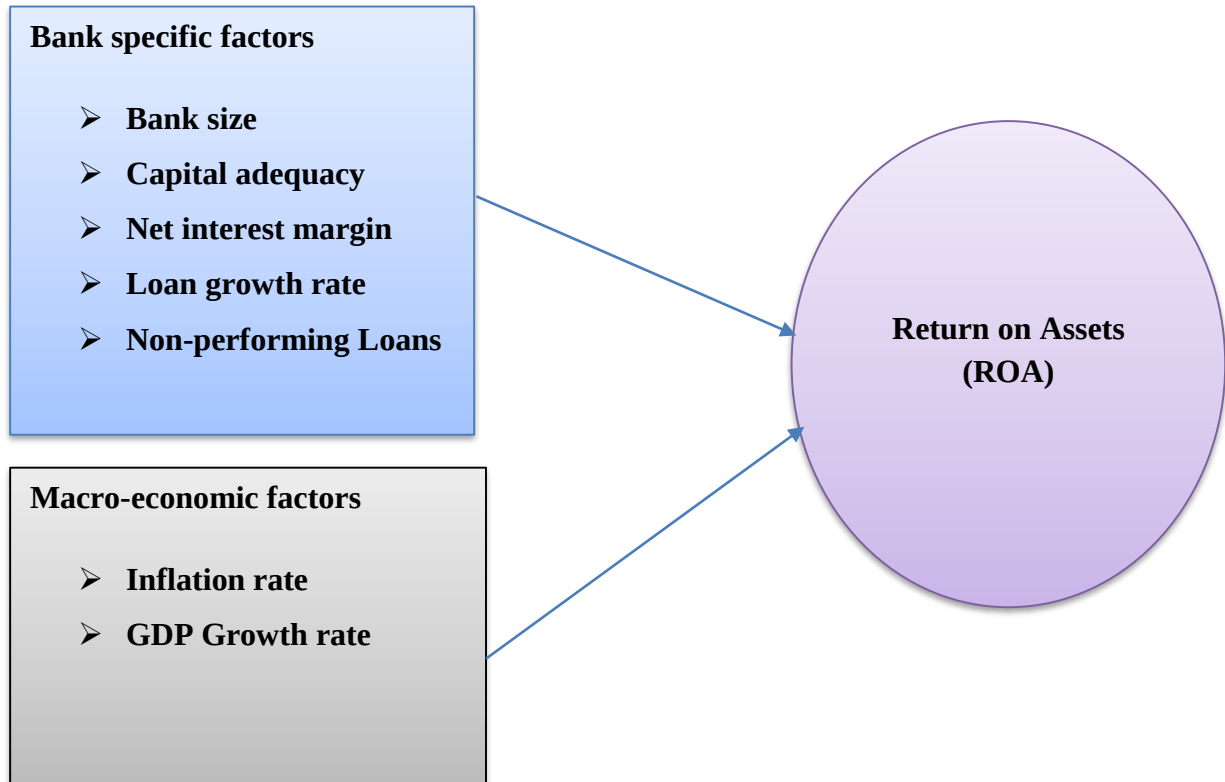
2.3 Conceptual Framework

The relationship between the independent and dependent variables is graphically depicted in the conceptual framework. Different theories explain how these variables interact, as was covered in the theoretical review. The profitability of Ethiopian private commercial banks as determined by Return on Assets (ROA) is the study's dependent variable. Both bank-specific elements and more

general macroeconomic influences are considered independent variables. This makes it easier to see how these banks' profits may be impacted by liquidity issues.

Independent variable

Dependent variables



Source: The researcher's compilation

Chapter Three

Research design and Methodology

3.1. Introduction

This chapter outlines the research methodology employed to investigate the effect of liquidity risk on the profitability of private commercial banks in Ethiopia. It details the research design, approach, population and sampling techniques, data collection and analysis methods.

3.2. Description of the study area

The study focused on private commercial banks in Ethiopia, which are vital financial organizations for the nation's economic growth. The specific study area comprised selected Ethiopian private commercial banks with at least ten years of operational experience.

3.3. Research design

The study adopted a mixed research design, incorporating both explanatory and descriptive approaches. According to (Kothari, 2004) a research design serves as a comprehensive plan for an empirical investigation, providing the structure for data collection, measurement, and analysis. The explanatory design was used to examine the cause-and-effect relationship between liquidity risk and profitability. Concurrently, a descriptive design was employed to provide a clear overview of the liquidity risks faced by private commercial banks in Ethiopia

A thorough plan for gathering data for an empirical investigation is called a research design. It provides the structure for gathering, calculating, and analyzing data. The creation of models, theories, hypotheses, instruments, measurement techniques, experimental control, variable manipulation, empirical data collecting, and data analysis are all goals of a research design (Kothari, 2004). As a result, the design describes the goals the researcher hopes to achieve by analyzing the hypothesis, which guides the ultimate interpretation of the results. An explanatory research design was used in the study to examine how the independent variable affected the dependent variable.

3.4. Research Approach

Quantitative research involves collecting numerical information that can be examined through mathematical techniques, as the formulated hypotheses need to be evaluated concerning the relationship among various variables (Creswell, 2003). This study adopted a quantitative research approach. Quantitative methods are particularly suitable here as the study aims to test hypotheses about the relationship between variables by using statistical techniques. Measurement is a critical component, creating the necessary link between empirical observations and the mathematical expression of these relationships. This approach is expected to facilitate the collection of relevant data and the evaluation of theoretical frameworks, thereby enhancing the understanding of the liquidity and profitability dynamics being examined.

3.5. Population and sampling techniques

The target population in research refers to the complete group of individuals, organizations, or events that share relevant characteristics and are of interest to the study. Essentially, it is the broader pool from which researchers select their sample.

For this study, the focus was on all licensed and actively operating private commercial banks in Ethiopia. These banks formed the core population from which data was drawn, covering the fiscal years from 2015 to 2024. By examining this group, the research aimed to capture meaningful insights into Ethiopia's private banking sector during this period.

A sample consists of a collection of items chosen from a population and serves as a representation of that entire population, functioning as a subset of it. The fundamental notion behind sampling is that by choosing a subset of a population, inferences about the full population can be made (Zikmund, 2003). To ensure data manageability and minimize bias, the study selected a sample of 10 banks using the purposive sampling technique. The primary selection criterion was the availability of at least ten years of audited annual financial statements for the period from 2015 to 2024.

Sample framework: A sampling frame is a list of all items in the population from which a sample is drawn (Zikmund, et al., 2009). For this study, the frame consisted of all licensed private

commercial banks in Ethiopia. A sampling frame essentially a list of potential candidates for selection was used to identify participants (Zikmund, et al., 2009). The research adopted a non-probability sampling approach, specifically purposive sampling, to intentionally select private commercial banks that best fit the study's objectives. Based on the criteria, the following ten banks were selected: Awash International Bank (AIB), Dashen Bank (DB), Bank of Abyssinia (BOA), Wegagen Bank, Nib International Bank (NIB), Cooperative Bank of Oromia (COOP), Lion International Bank (LIB), Oromia International Bank, Zemen Bank (ZB), and Abay Bank. These banks were chosen because they represent a substantial segment of Ethiopia's private banking sector in terms of asset size, market presence, and operational experience, making them well-suited for assessing liquidity risk patterns over time.

Table 1 **List of selected banks**

No.	Banks's name	Year of establishment (G.C)	Remarks
1	Awash Bank	1994	Bank
2	Dashen Bank	1995	Bank
3	Bank of Abyssinia	1996	Bank
4	Wegagen Bank	1997	Bank
5	Nib international Bank	1999	Bank
6	Cooperative Bank of Oromia	2004	Bank
7	Lion international bank	2006	Bank
8	Oromia International Bank	2008	Bank
9	Zemen bank	2008	Bank
10	Abay Bank	2010	Bank

Source: NBE as of December 31/ 2024

3.6. Data Type and Source

The research utilized secondary data collected from existing sources, specifically panel data that tracks multiple entities over several time periods. This approach allowed for an in-depth analysis

of how each entity evolved over the years. The study examined ten years' worth of audited financial statements including balance sheets and income statements from commercial banks, covering the period from 2015 to 2024. These records were obtained from the National Bank of Ethiopia (NBE), the country's financial regulatory body. Additionally, broader economic indicators such as GDP growth and inflation rates were also sourced from the NBE to account for external economic influences. By leveraging these reliable datasets, the study ensured a comprehensive and well-supported analysis.

3.7. Methods of Data Analysis

Secondary sources were used to gather the data. Panel data, a type of secondary data source, was used in this study. A dataset that contains observations of different entities monitored over a number of time periods is referred to as panel data. The monitoring of each entity over a number of time periods allowed for the analysis of changes over time within the same entity. The secondary data came from commercial banks' audited financial statements (income and balance sheets) for the years 2015–2024 GC.

Understand the data began with collecting it from diverse origins. The study brought in STATA 17, a software that helped to analyze the data closely. The study recognized that different data and different questions need different tools, so the study customized analytical methods accordingly. Without structured data in hand, especially the kind that follows the same subjects over a period (panel data), the study first painted a broad picture using simple descriptions like averages and typical variations. Following this, the study employed more sophisticated statistical tools, like correlation and regression, to explore the 'how' and 'why' uncovering potential relationships between different elements and gauging the strength of those connections.

3.8 Descriptions and Measurement of Study Variables

The study variables are explained and measured in this section. Bank size, loan growth, capital adequacy, non-performing loans, net interest margin, inflation, and GDP growth rate will all affect the study's dependent variable, banks' profitability (ROA). Data availability and its impact on their profitability, as noted in the literature, will be taken into consideration while selecting the

explanatory factors. The measurement of each variable will be calculated based on the nature of the variable as indicated (Table 2) below.

Table 2 Evaluation of research variables and anticipated signs

Name of Variables	Formula	Notation	Expected sign	Sources	Remarks
Profitability	Net Profit / <i>Total Assets</i>	ROA		Mohamed and Hazem (2015)	
Bank Size	Logarithm of total assets	BS	+	Mohamed and Hazem (2015)	
Non-performing Loans	provision for doubtful loans/ Total loan	NPL	+	Hasan (2013)	
Loan growth	Current year Loans - Previous year Loans previous year loan	LOG	-	Adam & Buckle (2000)	
Net interest margin	Net interest income/total asset rate	NIM	+	Pratheepan (2014)	
Capital Adequacy	Total Equity /Total Asset	CAP	+	Mohamed and Hazem (2015)	
GDP growth rate		GDP	+	Hasan (2013)	
Inflation Rate		IR	-	Alghusin (2010)	

3.9 Model Specification

Examining the connection between each explanatory variable and the profitability of private commercial banks (ROA) was the main goal in respect to the presented hypotheses. In order to achieve the main goal of the study, the researcher created an econometric model that contains the essential elements of the economic phenomenon in order to assess the dynamic and concurrent link between liquidity risk and bank profitability. A panel data model, which was thought to have benefits over cross-sectional and time series data methodologies, could be applied because of the kind of data that was accessible.

The study decided to use panel data for their study, which, as (Brooks, 2008) explained, involved pooling observations from various cross-sections over a stretch of time. A key steps was to conduct a Hausman test, which helped the researcher to choose between two common ways of analyzing such data: the fixed-effects model and the random-effects model. The decision between these two models hinged on what the Hausman test revealed. A p-value that came out as statistically significant (at their 5% threshold) meant they'd opt for the fixed effects model. If it wasn't significant, the random effects model was deemed more appropriate. While the statistical test was paramount, the resercher also acknowledged that, in line with (Gujarati, 2004), the relative ease of computation could sometimes play a part in guiding these methodological decisions

To evaluate the previously established research hypothesis, the following empirical model will be developed for this study.

$$ROA = \beta_0 + \beta_1 CS_{i,t} + \beta_2 NPL_{i,t} + \beta_3 CAP_{i,t} + \beta_4 LONG_{i,t} + \beta_5 NIM_{i,t} + \beta_6 IR_{i,t} + \beta_7 GDP_{i,t} + e_{i,t}$$

Where,

β_0 = intercept of the regression line

$\beta = 1, 2 \dots 8$ are parameters to be estimate

ROA = Profitability (Return on asset)

BS = company size

NPL = Non-performing Loans

CAP = Capital Adequacy

LONG= Loan growth

NIM = Net interest margin

IR = inflation rate

GDP = GDP growth

e = error term controlling for unit-specific residual in the model.

i = banks $i = 1 \dots 10$

t = The index of time periods and $t = 1 \dots 10$

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

In order to answer the main research questions, the study employed descriptive analyses, correlation and regression analysis as follows

4.1 Descriptive statistics of the Findings

The descriptive statistics summarized the data used in the regression model. This section starts by providing a statistical snapshot of both what the study sought to explain (the dependent variable) and the factors that influenced it (the independent variables). To do so, the study examined several independent variables, including Bank Size (BS), Capital Adequacy (CAP), Non-Performing Loan (NPL), Loan Growth, Net Interest Margin (NIM), GDP, and Inflation. The study used descriptive statistics to get a good handle on the basic characteristics of the data gathered from the study used descriptive statistics to understand the basic characteristics of the data collected from private commercial banks. The study presented these using frequency counts, and for numerical data, calculated the mean (average) and standard deviation.

Table 3 Descriptive Statistics of Dependent and Independent Variable

Variables	Observations	Mean	St.d	Minimum	Maximum
ROA	100	.0501284	.439998	-.0419	.3736
BS	100	5.759625	2.047436	2.5065	9.5262
LONG	100	5.602855	3.960189	.9538	25.9026
CAP	100	.2077505	.1173275	.372	.5118
NPL	100	.9324667	.4172132	.0001	2.3854
NIM	100	.5797382	.2282273	.1182	.9177
GDP	100	9.3825	1.73276	6.05	12.55
IF	100	13.59833	7.642483	6.62	32.01

(Source: Financial statement and own computation through STATA 17)

As indicated in Table 3, the banks in the study sample had a mean Return on Assets (ROA) of 5%. This signifies that, on average, for every 1 Birr of assets, the banks generated 0.05 Birr (5 cents) in profit after tax. The data shows considerable performance variation: the most profitable bank achieved an ROA of 37.36%, while the least profitable bank incurred a loss, with an ROA of -4.19%.

The standard deviation for ROA was 4.39%, which is relatively low. This suggests that the profitability of the sampled banks did not vary drastically and was clustered around the mean. While performance was generally consistent, the existence of both highly profitable banks and loss-making ones indicates that a key challenge for some private commercial banks in Ethiopia is optimizing asset utilization to improve returns.

Table 3 indicates that the average bank size, likely measured as the natural logarithm of total assets, was 5.75. This logarithmic transformation is a standard practice to normalize the data and reduce the effect of outliers. The observed range was significant, with a minimum value of 2.50 and a maximum of 9.52, reflecting substantial differences in the scale of operations across the sampled banks.

On average, the commercial banks' loan portfolios grew by 5.6% annually. This figure points to a steady expansion of lending activities across the sector. However, strategies varied widely, with a maximum loan growth rate of 25.9% and a minimum of 0.95%. This wide dispersion suggests that some banks pursued aggressive growth strategies, while others were more conservative in expanding their loan books. The standard deviation of 3.9%, while seemingly small, still points to diverse approaches in managing portfolio growth and risk among the banks.

Capital adequacy, a critical measure of a bank's ability to absorb unexpected losses, averaged 20.77% for the sample. This mean suggests that, on average, the banks maintained a healthy capital buffer. The range was broad, from a low of 3.72% to a high of 51.18%, indicating significant differences in individual banks' risk appetites and capital management policies. The standard deviation of 11.73% is relatively high, confirming this notable variation in capital reserves held to protect against financial risks.

As indicated in Table 3, The average NPL stood at a significant 93.24%, with a standard deviation of 41.72%. This high standard deviation means there's a considerable variation in NPLs across the selected Ethiopian Private Commercial Banks. In simpler terms, the NPL figures in these banks deviate quite a bit from the average. It suggested that, on average, these banks hold 93.24 cents in current assets for every 1 Birr of their non-performing loans. The large standard deviation of 41.72% indicates that this "asset coverage" for NPLs varies greatly among banks, likely due to differences in their operational success and how long they've been in business. The study saw a massive range in NPLs, from a tiny 0.01% at the minimum to a staggering 238.54% at the maximum. This wide spread suggests a crucial point that Ethiopian Private Commercial Banks with more liquid assets tend to be more profitable than those with less liquid assets. It also clearly highlights the significant differences in NPL levels among the companies operating in Ethiopia that examined in this study.

The average Net Interest Margin (NIM) for the banks was 57.97%. This indicates that the banks earned, on average, nearly 0.58 Birr for every 1 Birr of interest-earning assets after accounting for interest expenses. This strong average points to a profitable core lending business. The standard deviation of 22.82% reveals significant variation in efficiency, suggesting that some banks are far more effective at managing interest income and expenses than others. The wide range, from a low of 11.82% to a high of 91.77%, underscores the stark difference in the profitability of primary banking operations among the institutions.

During the study period, the Ethiopian economy experienced robust average annual growth of 9.38%. This strong economic environment is generally conducive to banking operations, as it supports loan repayment capacity and increases demand for credit. The low standard deviation of 1.73% indicates that this economic growth was relatively stable and consistent from year to year. While there were fluctuations, with a minimum growth rate of 6.05% and a maximum of 12.55%, even the lowest rate is considered healthy, suggesting a predictable and favorable macroeconomic backdrop for the banks.

According to the data Ethiopia's average inflation rate over the study period was a comparatively high 13.60%. Prices for products and services were often rising quickly due to high inflation. This can have two negative effects on banks: it can reduce the actual value of their assets and loans, and it frequently forces the central bank to modify its policies, which has an immediate impact on bank operations. Inflation's standard deviation was approximately 7.64%. This figure, which is rather large, indicates that the rate of inflation was not constant and varied greatly from year to year.

Businesses, especially private commercial banks, were thus forced to deal with both lower and significantly greater inflationary time significant Inflation rates varied greatly, ranging from 6.62% at the lowest to 32.01% at the highest. This wide disparity demonstrates that inflation was, in fact, highly erratic, making it difficult and frequently unpredictable for Ethiopian private commercial banks to operate. For these banks to stay stable and profitable in such a setting, it is imperative that they manage their assets and liabilities well.

4.2 Correlation result analysis

The study was essentially measuring how two things are connected. As (Field, 2009) puts it, it's a way to figure out the extent to which two or more variables are related to each other. To do this, the study used the Pearson product-moment correlation, which is one of the most common ways to look at relationships between two variables.

The correlation coefficient (r) as a score that ranges from +1 to -1.

- A score of 0, it means there's absolutely no linear relationship between the two variables, as Brooks (2008) points out. They aren't moving together in a straight line at all.
- A score of +1 means there's a perfectly positive relationship. When one variable goes up, the other goes up by the exact same amount.
- Conversely, a score of -1 means there's a perfectly negative relationship. When one variable goes up, the other goes down by the exact same amount.

Variables	ROA	BS	LONG	CAP	NPL	NIM	GDP	IF
ROA	1.0000							
BS	0.6935 0.0000	1.0000						
LONG	-0.4975 0.0000	-0.502 0.0000	1.0000					
CAP	0.6205 0.0000	0.6550 0.0000	-0.8040 0.0000	1.0000				
NPL	0.2705 0.0001	0.2199 0.0016	-0.1037 0.1398	0.1468 0.0361	1.0000			
NIM	-0.6549 0.0000	-0.6671 0.0000	0.6087 0.0000	-0.6141 0.0000	-0.5685 0.0000	1.0000		
GDP	0.0847 0.2283	0.0877 0.2121	0.0022 0.9755	-0.0337 0.6326	0.3300 0.0000	-0.2386 0.0006	1.0000	
IF	-0.0768 0.2748	-0.0541 0.4425	0.0219 0.7560	-0.0322 0.6476	0.0823 0.2417	-0.0401 0.5694	-0.2023 0.0037	1.0000

Table. 4 Correlation coefficient matrix variables

Correlation is all about figuring out how strongly two or more variables are linked to each other. With a sample size, around 100 observations, a correlation coefficient of about 0.20 or higher is generally considered statistically significant at the 5% level. This means the study can be reasonably confident that the relationship we're seeing isn't just due to random chance.

The correlation matrix (Table 4) provides a good preview of the likely relationships between the variables in this study. The results show that the correlations between pairs of variables range from a strong negative relationship of $r = -0.6549$ all the way to a strong positive one of $r = +0.6975$. Many of these relationships are statistically significant at both the 1% and 5% levels, giving us valuable insights into how these factors interact within Ethiopian Private Commercial Banks.

The study found that there is strong relationship between Bank size and profitability with $r=0.6935$. This relationship is highly significant, meaning it's very unlikely to be just a coincidence. This indicated that in Ethiopia, larger private commercial banks tend to be more profitable. It seems that as these banks grow in size, their ability to generate profit generally goes up.

The study also observed a moderately strong negative connection ($r = -0.4975$) between how fast banks grow their loans and their profitability. This relationship is statistically significant, meaning it's unlikely to be random. This finding suggests something quite interesting: when Ethiopian Private Commercial Banks expand their loans at a faster rate, their profitability tends to decrease. It's possible that this rapid expansion might come with increased risks or perhaps less efficient lending practices that ultimately impact their bottom line.

The study found a positive correlation of 0.6205 between capital adequacy and ROA, which is statistically significant (meaning it's very unlikely to be random, with a p-value less than 0.01). Basically, this means that banks that have more money set aside as capital tend to make more money. It really drives home the point that having a solid financial cushion is super important for a bank's bottom line. The correlation also showed that banks with a stronger capital base meaning they have more money set aside to cover unexpected losses tend to be more profitable. It highlights the importance of having a robust financial cushion for overall success.

The number of non-performing loans and ROA, or the quantity of bad loans a bank has and its profitability, showed a weakly positive association of 0.2705. It is vital to emphasize that this is not a strong correlation, even if the result is statistically significant ($p < 0.01$). The study found a negative connection of -0.6549, which is statistically significant (meaning it's highly unlikely to be random, with a p-value less than 0.01). It suggested that banks that place an excessive amount of emphasis on obtaining large interest margins typically have lower total earnings. It raises the question of whether pursuing those large margins could inadvertently cause them to use their assets less effectively or even result in other unintended issues that reduce their overall earnings.

The association between bank profitability (ROA) and overall economic growth (GDP) was found to be quite poor ($r = 0.0847$). It wasn't statistically significant, which is more essential. This means that, given the study's p-value of 0.2283. It seems like the broader economy isn't directly dictating

their bottom line in a straightforward way. Similarly, inflation doesn't have a big, direct impact on how profitable banks are (ROA). The study saw a weak correlation of -0.0768, and that wasn't statistically significant (with a p-value of 0.2748). So, just like with overall economic growth, it seems that neither inflation nor GDP are strong, direct drivers of bank profitability.

4.3 Basic assumption, Model Selection and Diagnostics Tests

The study run diagnostic tests to be sure the study findings were the real deal. the tests were presented in the following sections.

4.3.1 Hausman Test

Table 4 Hausman Test

Variables	----- Coefficients-----			
	(b) F	(B) r	(b-B) Difference	Sqrt (diag (V_b-V_B)) S.E.
BS	.0137045	.0078297	.0058748	.0025159
LONG	.0020206	.001131	.0008896	.0009474
CAP	2677217	.113642	.1540797	.0525108
NPL	-.010787	-.0028776	-.0079094	.0040751
NIM	-.0716029	-.0572115	-.0143914	.0167224
GDP	-.0002241	-.0002918	.0000678	.0003417
IF	-.0001819	-.0003545	.0001726	

Based on xtreg (Source –STATA output)

b = consistent under Ho and Ha

B = inconsistent under Ha, efficient under Ho

Test: Ho: non-systematic difference in coefficients

$(b-B)'[(V_b-V_B)^{-1}] = \chi^2(7)$ (b-B) = 21.40 Prob> $\chi^2 = 0.0032$ (V_b-V_B is not positive definite)

To select the appropriate panel data model, the study had to choose between two primary approaches: Fixed Effects (FE) and Random Effects (RE) models. The Hausman test was employed to make this determination. The Fixed Effects (FE) model is robust, providing consistent

estimates even when unobserved, bank-specific characteristics (e.g., management culture, risk appetite) are correlated with the independent variables. In contrast, the Random Effects (RE) model is more efficient (produces more precise estimates) but relies on the critical assumption that these unobserved effects are *not* correlated with the independent variables. If this assumption is violated, the RE model produces inconsistent and biased results.

The Hausman test was performed to test this assumption. With 7 degrees of freedom, the test yielded a chi-squared statistic of 21.40 and a corresponding p-value of 0.0032. Since this p-value is well below the standard significance level of 0.05, the null hypothesis (that the Random Effects model is appropriate) was rejected. This result indicates a systematic correlation between the unobserved bank-specific attributes and the model's repressor. Therefore, the Fixed Effects model was selected as the most suitable and reliable specification for this analysis.

.4.3.2 Multicollinearity Test

Variables	VIF	I/VIF
NIM	3.86	0.259175
CAP	3.79	0.263980
LONG	3.35	0.298165
BS	2.37	0.421060
NPL	1.87	0.533786
GDP	1.24	0.803753
IF	1.09	0.919418
Mean VIF	2.51	

Table 5 Multicollinearity Test (Source –STATA output)

In statistics, especially when we're trying to figure out how different factors influence an outcome, the study run into trouble when those factors or predictors are highly correlated with each other. When they're too intertwined, the model struggles and makes it really difficult for the model to precisely figure out how much each individual variable is actually contributing.

To test for multicollinearity, this study calculated the Variance Inflation Factors (VIFs) and their corresponding tolerance for each independent variable they were using. The software output would then usually list these VIFs alongside their tolerance which is the reciprocal of the VIF ($1/\text{VIF}$). If VIF is 1, there's absolutely no multicollinearity in the model. Generally, if VIF is below 5, multicollinearity isn't an issue you need to worry about. If the VIF values are between 5 and 10, there may indicate a moderate level of multicollinearity that warrants further investigation. However, a VIF exceeding 10 is a strong indicator of severe multicollinearity that must be addressed.

The tolerance value, calculated as the reciprocal of the VIF ($1/\text{VIF}$), provides a complementary measure of multicollinearity. In contrast to VIF, a high tolerance value (approaching 1) is desirable, as it signifies a low degree of correlation among the independent variables.

As shown in Table 6, the diagnostic tests confirmed that multicollinearity was not a concern for this model. All individual Variance Inflation Factor (VIF) values were low. The highest VIF was 3.86 for the Net Interest Margin (NIM) variable, a value well below the commonly accepted threshold of 5. Furthermore, the mean VIF of 2.51 provides additional evidence of low inter-correlation among predictors.

These results indicate that the independent variables were sufficiently distinct from one another. This ensures that the model can produce stable and reliable estimates of the individual effect of each predictor on bank profitability.

4.3.3 Serial (Auto) correlation Test

Robust Born and Breitung (2016) HR-test for heteroscedasticity as a post estimation Panel
var: COID

Time var: YEAR

Variable	HR-stat	p-value	N	max T	balance?
-0.83		0.409	10	10	balanced

Notes: Under H_0 , $HR \sim N(0,1)$

H_0 : No first-order serial correlation.

H_a : Some first order serial correlation.

Table 6 serial correlation

The serial correlation assumption is concerned on the errors are linearly independent of one another (uncorrelated with one another). It is stated that they are auto correlated if the errors are correlated with one another. If there is serial correlation in the error term, the correlation should higher than 0.9 with the dependent variable (Wooldridge, 2002). But, the result of the study was correlated at 1% and at 5% significance level ranging from $r = -0.6549$ to $+ 0.6975$ as shown in table 5 above. Therefore, to ensure validity of the statistical results, studies which include a regression on panel data therefore adjust the standard errors of the coefficient estimates there is no autocorrelation problem in study.

The Robust Born and Breitung (2016) HR-test for serial correlation yields an HR-statistic of -0.83 and a p-value of 0.409 . Under the null hypothesis (H_0), there is no first-order serial correlation, and $HR \sim N(0,1)$. The alternative hypothesis (H_a) suggests some first-order serial correlation. Since the p-value (0.409) is significantly greater than common significance levels (e.g., 0.01 , 0.05 , or 0.10), the study failed to reject the null hypothesis. The HR-test indicated no statistically significant evidence of first-order serial correlation in the panel data. This finding was consistent with the study's statement that it had adjusted the standard errors of the coefficient estimates to address potential autocorrelation issues and ultimately found no such problem.

4.3.4 Heteroscedasticity Test

Table 7 Heteroscedasticity Test

Modified Wald test for group wise heteroscedasticity in fixed effect regression model
$H_0: \sigma(i)^2 = \sigma^2$ for all i
$\chi^2(10) = 1.2e+05$
$\text{Prob} > \chi^2 = 0.0000$

(Source –STATA output 17)

Another statistical hurdle the researchers had to consider was something called 'heteroscedasticity.' This term really just described a situation where the 'spread' or variability of the model's errors

(the differences between predicted and actual values) wasn't consistent across all levels of their independent variables. If this variability did change meaning the errors were more spread out for some values of the predictors and less for others it was a sign of heteroscedasticity.

Fortunately, there were established methods to sniff out heteroscedasticity, with tests like the Breach-Pagan test. These tests essentially examined the standard errors that came out of the initial regression results to see if problematic patterns existed.

The Breusch-Pagan test was used to weigh up two possibilities. The first, or 'null hypothesis,' was the ideal scenario: that the error variances were all nicely equal (a state called 'homoscedasticity'). The second, or 'alternative hypothesis,' suggested the opposite: that the error variances weren't equal and actually changed based on one or more of the variables in the model, indicating heteroscedasticity. This unevenness in error spread could crop up for various reasons, such as issues with how data was measured, the model itself not being the best fit, or even because there were different subgroups within the data that behaved in distinct ways.

When the study looked at their own findings, which they presented in Table 8, the probability value from their chi-square statistic was less than 0.05. This was a clear indicator. It meant they had to discard the idea that the variance was constant (the null hypothesis), and they could do so with confidence at the 5% significance level. In simple terms, this told them that heteroscedasticity was indeed present in the residuals of their model.

When the study ran the Breusch-Pagan test, the results showed an F-statistic of 39.47 with 7 and 9 degrees of freedom, and the probability associated with this (often shown as 'Prob > chi2' or 'Prob > F' in statistical outputs) was 0.0000. The study was looking at this in the context of a 5 percent confidence level. Since this probability of 0.0000 was clearly much smaller than their 5 percent threshold, that heteroscedasticity was indeed a feature of their data, although in this specific situation, it wasn't seen as a major stumbling block. Nevertheless, this finding clearly indicated that the data didn't meet the ideal condition of homoscedasticity where error variances are equal.

4.4 Regression Analysis and Discussions

The study used panel data model techniques to forecast dependent variable values from independent variables. This approach is beneficial because panel data combines both time series (observations over time for the same unit) and cross-sectional (observations across different units at a given time) dimensions. The study also utilized the Hausman specification test at a 5% significance level to make this model choice, implying that they followed the standard econometric practice of comparing the efficiency and consistency of the FE and RE estimators to determine the most appropriate model for their data. The model choice utilized here was based on computational convenience by the STATA version 17.

Table 8 Researchers Computation through STATA 17

Fixed-effects (within) regression			Number of Obs = 100		
Group variable: COID			Number of groups = 10		
R-sq: within = 0.1637			Obs per group: min = 10		
between = 0.8539			Av g = 7.0		
overall = 0.5562			max = 10		
			F (7,9) = 39.47		
corr (u_i, Xb) = -0.8879			Probability > F = 0.00		
(Std. Err. adjusted for 10 clusters in COID)					
Robust					
ROA	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]
CS	.01370	.0029316	4.67	0.000	.0074898 .0199191
LONG	.00202	.0007629	2.65	0.018	.0004033 .0036379
CAP	.26772	.1061954	2.52	0.023	.0425975 .492846
NPL	-.01078	.0067817	-1.59	0.031	-.0251636 .0035896
NIM	-.07160	.0279578	-2.56	0.021	-.1308708 -.012335
GDP	.02024	.0011535	0.19	0.048	-.0026695 .0022213
IF	-.00018	.000212	-0.86	0.404	-.0006313 .0002675
_cons	-.03959	.0344956	-1.15	0.268	-.1127263 .0335283
sigma	.03114254				
sigma_e	.02738758				
rho	.56389126 (fraction of variance due to u_i)				

Source from –STATA software output 17

(Table 9) showed that the dependent variable was affected by the independent variables taken together. Within the variables, the R squared was 16.37%. However, the R squared between the variables was 85.39%, meaning that the six independent variables (company size, loan growth

ratio, GDP growth rate, non-performing loan, capital adequacy, and net interest margin) can account for 85.39% of the variation in the dependent variable of profitability/ROA.

This indicates that six independent variables identified the major determinants of the dependent variable, accounting for 85.39 percent of the total, whereas the remaining 14.61 percent of determinants were not explained in this study.

4.4.1 Bank Size

The result of the study indicated that company size regression result of this study revealed that there was a significant and positive relationship between company size and profitability of in Private Commercial Banks in Ethiopia with a regression coefficient of (Coef. = .0137, and p-value of 0.000). This indicates that company size has been considered as an important variable in clarifying banks' profitability. According to (Yisau, 2013) studies the effects of size on banks' profitability and the conclusions of the study that the impacts of size on profitability can be positive and this general idea seemed to resonate with what (Indranarain, 2009). In his view, there was a clear positive link: the bigger the bank, the more profitable it tended to be. It was predicted that the size of banks would significantly improve profitability in this research field.

4.4.2 Non-performing Loan

As the empirical finding indicates in Table 9 above, Non-performing Loan (NPL) on profitability has been found to have a negative relationship with its (Coef. = -0.01078, p-value = 0.031). However, since its 95% confidence interval (-0.0251636 to 0.0035896) includes zero, this negative relationship is not statistically significant at the 95% confidence level in this study. Therefore, while the direction aligns with the hypothesis that non-performing loans may reduce profitability, the evidence is insufficient to conclude a statistically significant impact. The outcome runs counter to the findings of Samuel & Abdulateef (2016), Endale (2015), and Nwakaeg (2014), who found a statistically insignificant negative association between profitability and non-performing loans

4.4.3 Net interest margin

The data in Table 9 showed that the net interest margin had a coefficient of -0.07160, with a p-value of 0.021. Since the p-value is less than 0.05, the relationship between net interest margin and

financial profitability (ROA) is negative and statistically significant at the 5% level. This indicates that higher net interest margins were associated with lower financial profitability (ROA), and the relationship was statistically significant. These findings aligned with earlier studies by Meaza M. (2014), Kalkidan (2016), and Malik (2011) who also found that private commercial banks with wider net interest margins experienced reduced profitability. The consistency across these studies suggested that increasing interest margins did not necessarily improve financial performance.

4.4.4 Capital Adequacy

The analysis revealed a statistically significant positive relationship between Capital Adequacy (CAP) and financial profitability (ROA) in Ethiopian private commercial banks. The regression coefficient of 0.26772 indicated that, holding all other factors constant, a one-unit increase in capital adequacy was associated with a 0.26772-unit increase in ROA. This positive effect was confirmed by a p-value of 0.023 and a 95% confidence interval of [0.0425975, 0.492846]. The findings are consistent with previous research by Laidroo (2014), which found that capital sufficiency increased Ethiopian Private Commercial Banks' profitability.

4.4.5 Loan Growth

The results presented in Table 9 show that loan growth (LONG) had a statistically significant positive effect on profitability. With a coefficient of 0.00202 and a p-value of 0.018, the relationship is significant at the 5% level. This indicates that as loan growth rose, the profitability of Ethiopian Private Commercial Banks increased significantly, while holding other independent variables constant at their mean values. The analysis provided sufficient evidence to conclude that there is a positive relationship between loan growth and bank profitability in the Ethiopian context. These findings align with previous research by Tekeste (2016), who also found a statistically significant and positive link between loan growth and the profitability of Ethiopian Private Commercial Banks, supporting the regression results of this study.

4.4.6 GDP Growth Rate

The regression analysis indicated that GDP growth rate has a statistically significant positive impact on bank profitability (ROA). With a positive coefficient, the model suggests that, holding all other factors constant, an increase in the GDP growth rate is associated with a corresponding increase in the Return on Assets for private commercial banks in Ethiopia. This positive

relationship was confirmed to be statistically significant at the 5% significance level, implying that the observed effect is unlikely to be due to random chance.

4.4.7 Inflation rate

The regression analysis indicated that inflation (IF) had an estimated negative impact on bank profitability (ROA), with a coefficient of -0.00018. This suggested that, holding other factors constant, a one-unit increase in the inflation rate was associated with a very slight decrease in a bank's Return on Assets. However, this observed relationship was not statistically significant at the 5% confidence level. This was evidenced by a p-value of 0.404, which was substantially greater than 0.05. The outcome was consistent with earlier research by Mutunga (2014) and Ayadi & Boujelbene (2012), which found no significant correlation between inflation and profitability. Other studies, such as Abdulateef and Samuel (2016), posit that while inflation can potentially boost profitability, it may also have a negative impact if not managed effectively.

4.5 Hypothesis Testing

Table 9 Hypothesis Testing

Alternate Hypothesis	Description	Decision
H1	Bank size has a significant effect on the profitability of private commercial banks in Ethiopia	Supported
H2	Nonperforming loan has a significant effect on the liquidity risk of private commercial banks in Ethiopia.	Rejected
H3	Net interest margin has a significant effect on the liquidity risk of private commercial banks in Ethiopia	Supported
H4	Capital adequacy has a significant effect on the liquidity risk of private commercial banks in Ethiopia.	Supported
H5	Loan Growth has a significant effect on the profitability of private commercial banks in Ethiopia	Supported
H6	GDP growth has a significant effect on the liquidity risk of private commercial banks in Ethiopia	Rejected
H7	Inflation rate has a significant effect on the liquidity risk of private commercial banks in Ethiopia	Rejected

Source – Researcher's Computation through STATA 17

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

The study investigated the relationship between several independent variables and the dependent variable, ROA (Return on Assets), using panel data techniques. The dataset consisted of 10 companies (COID) over a ten-year period, resulting in a largely balanced panel with 10 observations per group for a total of 100 observations. Following the numerical analysis, this chapter presents a summary of the study's findings, main conclusions, and recommendations for future research.

5.1 summary of findings

The study employed the Hausman specification test at a 5% significance level to choose between fixed effects and random effects models. The strong negative correlation between the unobserved fixed effects and the predictors ($\text{corr}(u_i, Xb) = -0.8879$) strongly supported the choice of a Fixed Effects (FE) model, indicating that unobserved, time-invariant characteristics specific to each company were significantly correlated with the independent variables. This made the FE model more appropriate for consistent estimation. The Robust Born and Breitung (2016) HR-test for first-order serial correlation indicated no statistically significant evidence of serial correlation (p-value = 0.409). This suggested that the errors were linearly independent over time within each group, and the study's adjustment of standard errors for autocorrelation was effective, or the problem was not present in the first place.

The Modified Wald test for group Wise heteroscedasticity in the fixed effects model yielded a highly significant p-value (0.0000). This led to the strong rejection of the null hypothesis of homoscedasticity, meaning that heteroscedasticity was present in the model. The variance of the error terms was not constant across all company groups. Despite the presence of heteroscedasticity, the study appropriately addressed this issue by using robust standard errors clustered at the COID level. This adjustment ensures that the reported standard errors, and consequently the t-statistics and p-values, are reliable for statistical inference, even with heteroscedasticity and potential within-group correlation.

The overall fixed effects regression model was highly statistically significant, showing that the independent variables as a group explained a significant portion of the variation in ROA. The within R-squared of 0.1637 indicated that 16.37% of the variation in ROA within each company over time was explained by the independent variables. The between R-squared of 0.8539 suggested that the independent variables explained a large proportion of the variation in ROA *between* different companies.

The fixed effects regression analysis revealed specific relationships between the independent variables and Return on Assets (ROA). There was a statistically significant positive relationship between company size (CS) and ROA. Similarly, loan growth (LONG) exhibited a statistically significant positive relationship with ROA. Conversely, net interest margin (NIM) showed a statistically significant inverse (negative) relationship with ROA. However, despite their respective signs, the relationship between non-performing loans (NPL) and ROA was not statistically significant at the 95% confidence level (as their confidence intervals included zero).

According to National Bank of Ethiopia reports from June 2024, Ethiopia's real GDP has grown by an average of 9.38 percent over the past ten years, with a maximum of 12.55 percent and a minimum of 6.05 percent. Additionally, the data shows a small standard deviation of 1.73 for GDP. This suggests that Ethiopia's economic development from 2015 to 2024 remained rather stable, and the outcome was largely consistent with the government's economic growth report. The findings of this study's fixed effects regression model indicate that this stable GDP growth has a statistically significant impact on the Return on Assets (ROA). However, inflation had no statistically significant impact on the Return on Assets (ROA) of the companies analyzed within the model at the 95% confidence level. This suggests that company ROA was more significantly driven by internal, firm-specific factors rather than by the observed macroeconomic growth during the period.

5.2 Conclusions

The primary objective of this study was to examine the factors affecting the profitability of private commercial banks in Ethiopia. To achieve this, the study employed five bank-specific variables and two macroeconomic factors. The bank-specific indicators included Capital Adequacy (CAP), Bank Size (BS), Loan Growth, Non-Performing Loans (NPL), and Net Interest Margin (NIM), while the macroeconomic factors were Gross Domestic Product (GDP) and the inflation rate. The analysis was based on panel data collected from a sample of ten Ethiopian private commercial banks with at least ten years of operational history. Bank-specific data were extracted from the annual audited financial statements of these banks, while macroeconomic data were sourced from the National Bank of Ethiopia (NBE).

Despite the detection of heteroscedasticity, the use of robust standard errors clustered at the company level ensures the reliability and validity of the statistical inferences. Crucially, the HR-test indicates that there is no first-order serial correlation, which reinforces the model's robustness. The set of independent factors taken together explains a sizable amount of the variation in ROA, especially the fluctuation within companies over time, as the total model is highly statistically significant.

The study identified that bank size (BS), loan growth (LONG), capital adequacy (CAP), and net interest margin (NIM) significantly affect the financial performance (ROA) of Ethiopian private commercial banks. Conversely, non-performing loans (NPL) and Gross Domestic Product (GDP) showed a statistically significant effect on ROA at the 95% confidence level. Inflation (IF) showed statistically insignificant relationship with ROA.

5.3 Recommendations

Based on the study's findings, the following recommendations are provided.

- ✓ **Manage Company Size Strategically:** The analysis clearly shows a significant positive link between company size and profitability (ROA). This means that larger banks, achieved through strategic growth, tend to be more profitable. Management should therefore aggressively pursue sustainable expansion, focusing on initiatives that enhance economies

of scale and operational efficiency. Driving strategic growth isn't just about getting bigger; it's about leveraging size to unlock higher profitability and solidify the bank's market position.

- ✓ **Loan Expansion for Enhanced Profitability:** The research strongly indicates that thoughtfully managed loan growth is a key driver of bank profitability. The study revealed a statistically significant positive link between expanding loan portfolios and improved Return on Assets (ROA). This means that as Ethiopian private commercial banks strategically grow their lending activities, their profitability is likely to increase. However, this isn't a call for reckless expansion. To truly capitalize on this relationship, banks must intensify their focus on rigorous loan origination processes and robust risk management. By ensuring the quality of new loans and mitigating potential risks, banks can confidently translate increased lending into superior financial returns.
- ✓ **Optimize Net Interest Margin Management:** A statistically significant inverse (negative) relationship was found between net interest margin and ROA. This counter-intuitive finding implies that excessively high net interest margins, perhaps due to overly conservative lending or inefficient cost structures, might hinder overall profitability. Banks should scrutinize their pricing strategies, funding costs, and operational efficiencies to optimize NIM in a way that positively contributes to ROA, rather than detracting from it.
- ✓ **Strengthen Capital Adequacy:** Our rigorous analysis demonstrated a statistically significant positive relationship between Capital Adequacy (CAP) and Return on Assets (ROA). This finding underscores a critical truth for Ethiopian private commercial banks: robust capital buffers are not merely a regulatory compliance requirement, but a powerful engine for sustained profitability. It is therefore paramount that banks prioritize and strategically strengthen their capital adequacy. Beyond merely safeguarding against unforeseen shocks and ensuring financial stability, superior capital ratios empower banks to: absorb greater risks from lucrative lending opportunities, expand market share and pursue growth initiatives with confidence, command greater trust from depositors and investors, potentially lower funding costs, and enhance operational efficiency by reducing the need for costly external funding or restrictive covenants.

- ✓ **Mitigate Non-Performing Loans impact:** Economically and fundamentally, non-performing loans represent eroded asset quality, trapped capital, and a direct drain on a bank's resources and profitability. Their inherently negative impact on financial health is universally recognized. Therefore, Ethiopian private commercial banks must continue to implement and relentlessly refine robust credit risk management practices by proactively monitoring, using early warning systems, and identifying and addressing potential defaults before they escalate.

5.4 Future Direction of Research

This study has several limitations. The study was restricted to quantitative secondary data and did not employ a qualitative approach, such as conducting interviews. Further research should be conducted using a qualitative approach to gain a deeper understanding of the determinants of profitability for Ethiopian Private Commercial Banks. In addition, most scholars investigate this topic by focusing on either banking institution in general or Ethiopian private commercial banks specifically. Thus, it would be beneficial to integrate these two areas of focus in a comprehensive study. A future study should be designed to include more indicators, variables, and data to ensure a robust analysis of the relationship between liquidity and financial performance in non-financial sectors.

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