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DETERMINANTS OF ETHIOPIAN COMMERCIAL BANKS PROFITABILITY

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DETERMINANTS OF ETHIOPIAN COMMERCIAL BANKS PROFITABILITY

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Declaration

I, the undersigned, declare that this is my original work, prepared under the guidance of Dr. Habtamu Adane. All sources of materials used for the thesis have been dully acknowledged, the researcher further confirm that the thesis has not been submitted either in part or in full to any higher learning institution for the purpose of earning any degree.

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This is to certify that the thesis prepared by Yonas Lakew Sime, entitled: Determinants of Ethiopian Commercial Banks Profitability, submitted in partial fulfillment of the requirement for Master of Science in Financial Economics with the regulation of the University and meets the accepted standard with respect to originality and quality.

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List of Abbreviation and Acronyms

BSZ - Bank Size

CAR - Capital Adequacy Ratio

EFF - Efficiency Ratio

GDP - Gross Domestic Product

GLS - Generalized Least Squares

INF - Inflation

LDR - Loan to Deposit Ratio

LIQ - Liquidity Ratio

NBE - National Bank of Ethiopia

NIM - Net Interest Margin

OECD - Organization for Economic Cooperation and Development

ROE - Return of Equity

ROA - Return of Asset

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Abstract

This study investigates the factors influencing the profitability of commercial banks in Ethiopia, utilizing Generalized Least Squares (GLS) methods on unbalanced panel data from 16 banks over the period of 1998 to 2023. In this study Return on equity (ROE) is the dependent variable in the random effect model regression analysis. It looks at how ROE is related to a number of internal and external factors, such as bank size, liquidity ratio, efficiency ratio, capital adequacy, loan-to-deposit ratio, GDP, and inflation. The findings reveal that GDP, bank size, loan-to-deposit ratios, capital adequacy, and efficiency ratios positively and significantly impact the profitability of Ethiopian commercial banks. Conversely, liquidity does not show a statistically significant effect, while inflation negatively affects profitability. Based on these insights, the study recommends that Ethiopian commercial banks pursue strategic mergers to enhance size and profitability, optimize loan-to-deposit ratios, strengthen capital adequacy, implement effective cost management strategies, diversify revenue streams, and promote a stable economic environment to support GDP growth and mitigate inflation.

Key Words, Determinants, Profitability and Commercial Banks

CHAPTER ONE

1. INTRODUCTION

1.1. Background of the study

Financial institutions play a main role in facilitating the global economy's growth. As a part of the financial system, financial intermediaries handle complex financial instruments and markets, match supply and demand in the financial markets, facilitate payment, maintain market transparency, and carry out risk management and transfer tasks. The financial sector in Ethiopia is composed of banking businesses, insurance companies, microfinance institutions, saving and credit associations, and the informal financial sector (Zerayehu, 2013).

A bank operates as an institution that handles various financial and monetary transactions, including deposits, loan, investments, and currency exchanges. This sector plays several crucial roles, such as providing essential financial services to the economy, fostering economic growth, ensuring efficient allocation of resources, lowering transaction costs, generating liquidity, enabling economies of scale in investments, and distributing financial risks (Haiss & Sümegi, 2008). This industry must continue to function at a certain level because of the crucial role it plays.

The concept of performance holds immense significance for organizations, regardless of whether they operate for profit or as non-profit entities. Performance can be understood as a measure of how effectively a firm utilizes its resources to achieve its goals and objectives. Financial performance metrics are crucial for evaluating and comparing firms across industries, providing insights into operational efficiency, return on investment, and profitability, enabling informed decision-making. Additionally, identifying and classifying the various factors that influence performance is particularly important for banks and financial institutions. By recognizing the dominant determinants of performance, these organizations can implement strategies to manage and optimize these factors, ultimately enhancing their overall performance (Peter, 2013). Evans (2014) emphasizes that profits serve as the primary determinant of a business's viability, growth, and sustainability. In other words, Profit generation is crucial for a company's survival and competitiveness, emphasizing the importance of performance measurement and management for long-term success.

The financial system's primary function is to efficiently network funds from investors to borrowers, resulting in improved profitability, increased flow of funds, and better customer service. In developed countries, financial markets and the banking system run together, while

in developing countries, it’s slight in banks fill the gap among savers and borrowers, and providing profitable and safe funds. A well-functioning financial system is crucial for countries Economic health, especially in countries like Ethiopia (Samuel, 2015).

According to the National Bank of Ethiopia (NBE) report from 2022, the history of the Ethiopian banking system dates back to 1905, when the Bank of Abyssinia was established as the country's first bank. This marked the beginning of formal banking operations in Ethiopia, setting the stage for the development of the financial sector. However, a more organized and regulated framework wasn't established until the Monetary and Banking Proclamation of 1994, which made a big difference in the growth of the banking sector in Ethiopia. The 1994 proclamation in Ethiopia facilitated a competitive banking environment, enabling private banks and state-owned institutions. Ethiopia is home to 31 commercial banks as of 2023, including 29 private banks. This expansion reflects both the nation's changing financial sector and the rising demand for banking services.

Ethiopia's banking industry continues to be characterized by operational inefficiencies, a lack of competition, a noticeable market concentration toward the big government-owned commercial bank, and a lack of diversity in ownership structures, even with the recent changes (Lelisa, 2007). The low efficiency of Ethiopia's banking sector makes it abundantly evident that the country's financial institutions perform worse than those in more developed countries. Therefore, in the countries, it is crucial to examine the factors affecting bank performance to enhance the management of banking operations with the goal of promoting profitability and efficiency, (Abera, 2012).

1.2. Statement of the Problem

In the literature on corporate finance, the variables that affect profitability have been discussed and debated for a long time. Profit determinants are a fascinating topic because they are dynamic variables that can change over time based on the firm's operational environment in different locations (Flamini et al., 2009). In earlier studies, a wide range of variables that can affect a bank's profitability were investigated in both theoretical and empirical literature. Among those factors, money supply, GDP, inflation rate, and foreign exchange rate are examples of macroeconomic components. Bank-specific factors include capital structure, bank size, bank age, liquidity, operational efficiency, leverage, and income diversification. Furthermore, no single, widely accepted findings exists to determine what factors determine the profitability of the banking industry, as countries differ in terms of their financial, economic, and operating environments. Consequently, these findings indicate that

additional study is required to determine the macroeconomic and bank-specific variables affecting the profitability of commercial banks.

Several studies have examined the performance of Ethiopian banks. Belayneh (2011) emphasizes various bank-specific factors that significantly impact profitability, while Abebaw and Kapuer (2011) identify key determinants such as bank size, intermediation, capital strength, and expense management. More recent studies by Samuel (2015) and Isayas (2022) also highlight factors affecting bank profitability, but their findings differ in the specific variables they identify. Samuel emphasizes positive factors such as GDP, capital adequacy, and bank size, whereas Isayas finds a negative correlation between bank profitability and both firm size and inflation. These inconsistencies indicate a need for additional research to clarify the variables influencing the profitability of Ethiopian commercial banks.

Overall, the concerns raised above about bank profitability indicate that, previous studies have inadequately examined the various internal and external elements that contribute to improved performance. This gap in the literature highlights the necessity for a comprehensive analysis of these factors to gain clearer insights. The study emphasises the need for further research on the impact of internal and external factors on the Ethiopian banking sector's enhanced performance.

The study will analyse data from all banks operating in Ethiopia that were established before 2021, collecting extensive long-term data for each bank from its inception to 2023. By employing a long-term perspective and an unbalanced panel data approach, this study seeks to contribute valuable findings to the existing literature and enhance the understanding of the factors influencing the profitability of commercial banks in Ethiopia.

The goal of this study is to address the gap in knowledge regarding the factors that influence bank profitability in Ethiopia, including the limited sample size, short-term data, and a variety of factors with inconsistent results.

1.3. Objective of the Study

The primary aim of this study is to determine factors that influence the profitability of commercial banks in Ethiopia.

Specifically, this study attempted to assess the following specific objectives:

i. To identify and analyse the main determinant factors that influence the profitability of commercial banks in Ethiopia.
ii. To investigate how Ethiopian commercial banks can improve their financial performance by optimizing their strategies.

1.4. Research Question

This study is predicated on addressing the following research questions.

i. What are the main determinants factors influencing the profitability of Ethiopian commercial banks?
ii. How can Ethiopian commercial banks improve their financial performance by optimizing their strategies?

1.5. Hypothesis of the Study

This study's hypotheses are grounded in empirical findings regarding bank performance that have been established by researchers in the banking field over the years. As a result, based on pertinent theories and earlier empirical research, the following research hypotheses have been developed regarding the factor that determines bank profitability.

H1: Bank Size is significantly affects bank profitability in Ethiopia.

H2: Liquidity ratio is significantly affects bank profitability in Ethiopia.

H3: Capital Adequacy is significantly affects bank profitability in Ethiopia.

H4: Loan is significantly affects bank profitability in Ethiopia.

H5: Efficiency ratio is significantly affects bank profitability in Ethiopia.

H6: GDP growth rate significantly affect bank profitability in Ethiopia.

H7: Inflation is significantly affect bank profitability in Ethiopia.

1.6. Significance of the Study

The study is helpful in suggesting potential implications and demonstrating the relationship between the factors that determine Ethiopia Commercial Banks' profitability as determined by both traditional and risk-based approaches. Additionally, the study supports the method used by bank management to control and analyze financial data, the choice of preferred banks by depositors and borrowers, and the investment decisions of investors (shareholders).

1.7. Scope of the study

The scope of the study was focused on the factors of Bank Size, Liquidity ratio, Capital adequacy ratio, loan to deposit ratio and Non-interest income to Non-interest cost ratio as internal factors, and GDP growth rate and Inflation rate as an external determinants of Ethiopia Commercial Banks profitability in the period covering from 1998 - 2023. These variables are assumed to consider core operational activities of the commercial banks in order to attest the objective of the study. All Ethiopian commercial banks that are registered with the National Bank of Ethiopia (NBE) are the subject of this study.

However, because of insufficient audited financial data, the study does not include commercial banks founded after 2021. In order to make accurate inferences, samples of sixteen commercial banks were selected based on their performance history and stable financial records.

CHAPTER TWO

2. LITRATURE REVIEW

The theoretical and empirical data pertaining to the factors influencing commercial bank profitability are provided under this chapter. The discussion is organized into three distinct sections for clarity and depth of understanding. The first section focuses on the theoretical frameworks and models that have been developed to explain the profitability of commercial banks. This includes a review of key economic theories and financial models that provide insights into how banks generate profits and the underlying mechanisms that drive their financial performance.

Following this, the second section explores into the primary factors that influence the profitability of banks. This encompasses a range of elements, such as interest rates, operational efficiency, regulatory environment, market competition, and other internal and external variables that can affect a bank's bottom line. Finally, the third section presents empirical research findings on the topic. This includes an analysis of various studies and data that have examined the relationship between the identified factors and bank profitability. By synthesizing these empirical insights, we aim to provide a comprehensive understanding of how these elements interact and contribute to the financial success of commercial banks. This chapter aims to bring light on the many variables at work by offering a comprehensive analysis of commercial bank profitability. It does so by combining theoretical perspectives with empirical evidence.

2.1. Theoretical Literature Reviews

2.1.1. Overview of Banking Activity

Banking activity encompasses a wide range of financial services that facilitate the flow of money and credit within the economy. Banking involves accepting deposits from individuals and businesses, providing loans and credit, and earning profit by charging higher interest rates on securities and loans than liabilities. Banks make money through the asset transformation process, which involves selling liabilities with particular characteristics and using the proceeds to purchase assets with new characteristics. In order to maximize profits, this process entails managing all assets and liabilities through short-term and long-term lending. Banks also offer various services, including payment processing, wealth management, and foreign exchange transactions, which enhance their role as financial intermediaries.

Banks use liabilities to acquire funds to purchase income-generating assets, which enable them to become profitable. Among these assets, loans and securities stand out as the primary sources of bank profits. Loans, which banks issue to individuals and businesses, typically yield interest income over time. Securities, such as bonds or stocks, also provide returns through interest or dividends, albeit they tend to be less liquid than other assets, meaning they cannot be easily converted to cash without a potential loss in value. Bank capital is crucial in the financial ecosystem, acting as a buffer against asset declines and ensuring banks remain solvent and able to meet their obligations. Banks must decide on capital levels to avoid failure, influence returns to equity holders, and comply with regulatory requirements. High capitals levels help avoid occupational hazards, while certain amounts influence returns (Van Ommeren 2011). The banking model relies on the intricate balance of liabilities, income-generating assets, and capital to drive profitability and manage risk.

Bank profitability is a critical measure of a bank's financial health and its ability to generate returns for shareholders. Stability in the banking industry is largely dependent on durable and sustainable profitability. It is influenced by a variety of factors, including the bank's management of interest income, non-interest income, and operating expenses. Additionally, external factors such as economic conditions, regulatory changes, and competitive pressures also play significant roles in shaping profitability. Measuring bank profitability involves various financial metrics that provide insights into a bank's performance and operational efficiency. Progressive Net Income helps us understand the health of the bank, but it suffers from a significant flaw in that it does not adjust for the bank's size, making it difficult to compare the bank's performance to that of other poorly performing banks. One key measure of bank profitability that takes into consideration the size of the bank is the return on assets (ROA), which is computed by dividing the total net income of the bank by the total value of its assets. ROA is a helpful measure of how well a bank manager is carrying out their responsibilities since it demonstrates how well the bank's resources are being used to generate profits. Another profitability metric that focuses on how much the bank is making on its equity investment is return on equity (ROE), which is calculated by the net income per equity capital (Guru et al., 2009).

Furthermore, the net interest margin (NIM), which represents the difference between interest income and interest expenses, is another often-used indicator of bank profitability. If the bank can raise money with low-interest liabilities and buy assets that generate significant interest income, or if it can generate significant income from its assets and incur little expense on its liabilities, then the bank will likely have a high net interest margin and be extremely

profitable. If the interest cost on the bank's liabilities rises relative to the interest earned on its assets, the net interest margin will drop and the bank's profitability will be negatively impacted.

2.1.2. **Theories of Bank Profitability**

Studies into the profitability of banks began in the late 1970s and early 1980s. The Market Power theories and Efficiency Structure theories are the first two industrial organization models applied in this study In adding, the theory of balanced portfolio subsequently brought to the analysis of bank profitability a greater awareness of itself (Atemnkeng & Joshph, 2006).

Studies into the profitability of banks have its roots in the late 1970s and early 1980s, a period marked by significant changes in the financial landscape and the emergence of various economic theories. Among these, the Market Power theories and the Efficiency Structure theories emerged as the first two industrial organization models applied to the banking sector. Market Power theories suggest that banks with greater control over their pricing and market share can achieve higher profitability, as they can set interest rates and fees that maximize their returns. Conversely, Efficiency Structure theories emphasize the importance of operational efficiency, positing that banks that manage their resources effectively can reduce costs and enhance profitability (Athanasoglou et al. 2006).

In addition to these foundational theories, the concept of a balanced portfolio was introduced to the analysis of bank profitability, further enriching the discourse around this topic. The theory of balanced portfolio highlights the significance of diversifying assets and liabilities to mitigate risk and enhance returns. This approach advocates for a strategic allocation of resources, allowing banks to optimize their financial performance while navigating the complexities of the market. As researchers like Atemnkeng and Joshph (2006) have noted, incorporating a balanced portfolio perspective into the analysis of bank profitability has led to a deeper understanding of how banks can achieve financial stability and growth. Consequently, a detailed discussion of each of the above mentioned theories and other theories relating to bank profitability and its determinant is provided in the following section.

2.1.2.1. ***Market Power Theory***

According to the market power hypothesis, a bank's performance is largely determined by the way the banking industry is structured. According to this theory, the degree of concentration within the banking sector can influence the ability of banks to set prices, manage costs, and ultimately generate profits. High concentration allows larger banks to control pricing, while fragmented markets may reduce prices and reduce profit margins, potentially increasing

profitability. However, this concentration can lead to variations in performance among banks, with larger institutions benefiting disproportionately. This theory is divided into the Relative Market Power (RMP) and Structure-Conduct-Performance (SCP) models (Tregenna 2009).

i. ***Structure-Conduct-Performance model***

Mason's Structure-Conduct-Performance model, developed in the 1930s and 1940s, significantly influenced organizational studies. It implies that market concentration in the banking industry boosts profitability because of the possibility of gaining market dominance. Banks can increase their profits by offering high lending rates and low deposit rates, which hurts customers. The model suggests that market structure affects banking performance, while seller and buyer behavior determines market performance in industries.

ii. ***Relative Market Power Model***

Shepherd (1983) developed the RMP model, which suggests that market shares have an impact on banking performance and that market power is acquired by large banks through product differentiation. Because of this, market shares and bank performance have a positive correlation (Berger, 1995). The RMP model does not account for the impact of concentration on the performance of small banks, which is where the SCP model differs.

2.1.2.2. ***Efficiency Structure Theory***

According to the Efficiency Structure Hypothesis, banks that use resources more efficiently than others are able to generate large profits. According to this theory, the bank will either select a production plan that maximizes profits given the prices of its inputs and outputs or lowers costs given its output mix and input prices. According to this theory, banks that make large profits are the most effective, and the variations in bank profits are explained by the efficiency of the point. The Scale Efficiency Hypothesis and the X-efficiency model are two distinct models that further develop the market power hypothesis in the context of banking. These models aid in the explanation of how banks can maximize their profitability and operational performance in relation to the market structure in which they function.

i. ***X-efficiency model***

In 1966, Leibensteinen presented the idea of Efficiency-X, which defined the difference between the optimal and actual efficiency. According to the X-efficiency model, a bank's capacity to set prices may therefore result from both market dominance and the efficient use of its resources in the provision of services and the realization of profits. Inefficient resource distribution leads to Efficiency-X, with efficient firms being more profitable due to lower costs. However, concentration does not necessarily correlate with bank performance.

ii. ***Scale Efficiency Hypothesis***

The Scale Efficiency Hypothesis, often referred to as the "Economies of Scale Theory," posits that larger organizations, including banks, can achieve significant cost advantages by optimizing their production processes and outputs. The Scale Efficiency Hypothesis suggests that as a bank expands its operations, it can spread fixed costs more efficiently, reducing average unit costs and enhancing profitability. This efficiency can be achieved through improved technology systems, better-trained staff, and enhanced customer service.

2.1.2.3. ***The Balanced portfolio theory***

The balanced portfolio theory approach plays a crucial role in shaping bank profitability by emphasizing the importance of asset diversification (Atemnkeng & Joseph, 2006). This theory suggests that banks can enhance their financial performance by strategically managing a diverse range of assets, which helps to mitigate risks while maximizing potential returns. A balanced portfolio theory suggests that diversifying investments can create a more resilient financial structure. Bank management's policy decisions influence portfolio composition, based on expected returns, risks, and portfolio size. The desired portfolio composition is linked to market conditions, regulatory constraints, and financial health. Banks may choose a conservative approach during economic uncertainty or higher-yield investments in thriving economies. The theory emphasizes the dynamic relationship between asset diversification and bank profitability, requiring continuous assessment of market conditions, regulatory changes, and operational capabilities. This approach enhances immediate financial performance and positions banks for long-term stability and growth.

2.1.2.4. ***Risk Avoidance Hypothesis***

The Risk-Avoidance Hypothesis, initially proposed by John Kenneth Galbraith in 1967 and later expanded upon by Cave in 1970, offers a nuanced perspective on the behavior of banks operating in concentrated markets. This hypothesis posits that banks may prioritize risk reduction over maximizing monopoly profits by opting for safer, less aggressive portfolios. In concentrated markets, banks may choose to avoid risky investments for stability and financial uncertainty, avoiding potential defaults and market volatility. This is due to the inherent risks associated with aggressive lending and investment strategies. The Risk-Avoidance Hypothesis highlights the importance of understanding the strategic decisions made by banks within these markets, as the drive for stability and risk management can significantly influence profitability metrics. This perspective encourages further exploration of how banks'

balance competitive advantage with risk mitigation, providing valuable insights into the banking sector dynamics Clark (1986).

2.1.2.5. *CAMEL Model*

The CAMEL model is a widely used framework for evaluating the performance and stability of financial institutions, particularly banks. It assesses financial institutions based on five essential criteria: management, earnings, liquidity, asset quality, and capital sufficiency. Capital adequacy measures a bank's financial stability, asset quality evaluates loan portfolio risk, management quality evaluates leadership competence, earnings assess profitability and sustainability, and liquidity measures the institution's ability to meet short-term obligations and manage cash flow. These elements are employed to refocus financial institutions' operational precision, regulatory compliance, and financial performance institutions (Ferrouhi, 2014a).

The CAMELS approach is regarded as an essential technique to assess the performance and profitability of banks. Several studies that have assessed bank performance using the CAMEL method have discovered a strong correlation between ratings and efficiency scores. Banks can diagnose their financial condition and take proactive measures toward sustainability with the aid of the CAMEL model (Ferrouhi 2014**a**).

2.1.2.6. *Capital Asset Pricing Model (CAPM)*

The Capital Asset Pricing Model (CAPM) predicts the relationship between financial risk and expected return based on the risk-free rate and systematic risk premium. It evaluates investor compensation for additional risk. CAPM, developed by Sharpe (1964), considers fluctuations in securities due to general stock exchange index changes and specific company changes. Total portfolio risk is viewed as a function of both systematic and unsystematic risk; systematic risk influences market variables like laws and regulations, while unsystematic risk affects particular attributes of the market, such as employee productivity and management control.

2.1.3. **Determinants of Bank Profitability**

There are two main categories of factors that affect a bank's profitability: internal factors and external factors. Internal factors are elements that are directly impacted by the operational and management practices of the bank. They are also sometimes referred to as bank-specific determinants. These elements consist of the bank's asset management strategies, loan portfolio quality, cost efficiency, and general operational efficacy. For example, a bank's profitability is largely dependent on how well it manages its accounts, including loans and deposits. Strong credit policies, prudent capital allocation, and effective risk management are

other essential internal variables that have a big influence on financial performance. However, external factors are outside the bank's control and include industry-specific influences and macroeconomic conditions. These external determinants include economic indicators such as interest rates, inflation, and overall economic growth, which can affect demand for banking services and the profitability of financial products. For example, changes in legislation or regulatory requirements can influence how banks operate and their ability to generate profits.

2.1.3.1. *Internal determinants*

The term "internal determinants of bank performance" is defined broadly by Anna P. L. Vong and Hoi Si Chan (2008) as variables that are significantly shaped by a bank's management practices and monitoring decisions. These internal determinants are significant because they show the effectiveness of the bank's governance structures and operational strategies. These factors should be a key area of concentration for bank management since they can improve a bank's performance and profitability.

According to Dr. Devinaga Rasiah (2010), internal determinants can be broadly categorized into two distinct sub-categories: financial statement variables and non-financial statement variables. Financial statement variables include metrics directly derived from a bank's financial reports. On the other hand, non-financial statement variables encompass a range of qualitative factors that also influence bank performance but are not directly reflected in financial statements.

i. *Financial Statement Variables*

Financial statement variables, including balance sheet and profit & loss accounts, are crucial for determining commercial bank profitability. Asset management focuses on maximizing returns and liquidity, while liability management focuses on minimizing funding costs and achieving stability in available funds. These decisions are controllable by management and impact profitability. Contrarily, profit and loss statements, indicate operational performance and focus on interest income, expense, fee based services and none-interest operational cost. The most widely used metrics for determining bank profitability that are derived from financial statements are as follows:

Capital

Capital is a vital factor in measuring bank profitability, impacting regulatory compliance, risk management, and growth potential. A well-capitalized bank can navigate challenges more effectively, enhance profitability, and support long-term financial health. Capital can be defined as paid-up share capital or owners' equity available to funding to bank's business.

Studies have repeatedly shown that banks with larger capital reserves typically outperform those with smaller capital levels. Because more capital serves as a safety net against future losses, improving financial stability and lowering the risk of insolvency, the relationship between capital adequacy and bank performance is crucial. Scholars have consistently shown a positive relationship between capital and profitability in the banking sector. Berger's 1995 study, Samy B. Naceur's 2003 research, Abreu and Mendes' 2001 study, Athanasoglou et al.'s 2005 analysis, and Ramlall's 2009 research all support this notion. Well-capitalized banks are more likely to engage in prudent risk-taking, leading to better financial outcomes. Javaid S. (2011) study further supports this notion, emphasizing the importance of sound capital management practices for sustainable growth and financial institution health.

Bank Size

The effect of bank size on profitability is frequently quantified through the measurement of total assets, as this metric serves as a key indicator of a bank's scale of operations. Larger banks, characterized by their substantial asset bases, are often better positioned to leverage economies of scale, which refers to the cost advantages that arise when a bank increases its level of production or service delivery. The relationship between bank size and profitability is often non-linear due to bureaucratic and operational complexities. To account for this, studies often use the logarithm of total assets as a metric for bank size. This approach allows for a more refined analysis and helps identify the threshold at which the benefits of size begin to wane, allowing for optimal bank size.

Several empirical studies have explored the relationship between bank size and the cost of raising capital, with findings suggesting that larger banks may indeed enjoy significant advantages in this area. Notably, researchers such as Indranarain Ramlall (2009), Devinaga Rasiah (2010), and Goddard et al. (2004) have provided evidence indicating that larger banks tend to incur lower costs when accessing capital markets. This phenomenon can be attributed to several factors, including enhanced credit ratings, increased investor confidence, and stronger bargaining power when negotiating financing terms. Because larger banks typically represent a lower risk to investors, they can secure funds at more favorable interest rates, ultimately leading to improved profitability.

Liquidity

Liquidity is a vital factor in measuring bank profitability, affecting the bank’s ability to meet obligations, interest income generation, and overall risk management. Balancing liquidity needs with profit maximization strategies is essential for sustaining profitability in dynamic financial environment. In other word, Bank liquidity refers to a bank's ability to meet

customer demand and provide advances through loans and overdrafts. It includes cash and equivalents like commercial paper. Insufficient liquidity can lead to bank failures, but holding liquid assets offers higher returns. Empirical studies have produced varying conclusions regarding the relationship between liquidity and profitability in the banking sector, highlighting the complexity of this dynamic. For instance, (Bourke 1989) identified a positive relationship between liquidity and profitability, suggesting that banks with higher liquidity levels are generally more profitable. Molyneux and Thornton (1992), on the other hand, came to a different conclusion and discovered a negative correlation between profitability and liquidity. Their research suggests that while having high liquidity can provide safety and stability; it may also indicate that a bank is holding excessive amounts of idle assets that are not generating sufficient returns.

Asset Composition

Total loans divided by total assets indicates the asset composition of a bank, showing the proportion of a bank's assets that are tied up in loans. When more deposits are converted into loans, banks can earn more money because they serve as middlemen between lenders and borrowers. Profits, however, may suffer from increased expenses associated with non-performing loans. One independent factor that influences how loans affect banks' profitability is their asset composition. A favorable correlation has been found by most banking area researchers, including Devinaga (Rasiah 2010) and (M. Abreu and Y. Mendes, 2002).

Deposit Fund

Commercial banks rely on public deposits for lending and interest income, making deposits the number one expense item in the banking sector. Deposits include current, fixed, and saving deposits. The best performing banks maintain high deposit accounts relative to their assets, increasing funds for investments and lending activities. The primary and least costly source of funding is deposits, which, provided there is enough demand for loans, have a positive effect on banking performance. But because deposit funding costs are high, a lack of loan demand could hurt earnings. A positive correlation has been found between deposit and profitability in several studies, including those by (Anna P. I. Yong and Hoi Si Chan, 2008).

Credit Risk

Credit risk is a critical measurement factor of bank profitability, influencing loan pricing, provisioning, and overall financial stability. Profitability is lowered by increased exposure to credit risk, indicating the need for better risk policy screening and monitoring. Consequently, banks would increase profitability by teaching credit risk screening and monitoring as well as such policies, as demonstrated by (Athanasoglou et al. 2005).

Market Share

Market share serves as a critical determinant of bank profitability, reflecting the extent to which a bank has captured a portion of the market for financial services. A larger market share in a bank indicates a stronger competitive position, allowing for economies of scale, lower operational costs, and enhanced profitability. This also leads to greater bargaining power with suppliers, increased customer loyalty, and higher revenue streams. However, profitability is not guaranteed by a high market share; factors like operational efficiency, risk management, and the competitive landscape also play crucial roles. According to certain empirical research, bank market share—defined as the proportion of a bank's loans over domestic credit in the nation—has a positive correlation with profitability (M. Abreu and V. Mendes, 2002).

ii. ***Non-Financial Statement Variable***

Non-financial statement variables encompass a variety of important factors that contribute to a company's overall performance and health. Among these factors is management quality, which is the ability and efficacy of the leadership group in directing the company toward its objectives. Furthermore, productivity and efficiency are important factors because they show how well resources are used to produce results and meet goals. The quantity of branches is another important factor that can indicate the market penetration and operational scope of the company.

Management Quality

Good management is crucial for a bank's profitability and stability. It has been demonstrated that competent management increases revenues and market shares (Athanasoglou et al., 2005).

Efficiency and Productivity

Indranarain Ramlall (2009) said higher efficiency levels lead to higher profits, and labor productivity growth positively affects profitability. Athanasoglou et al. (2005) provided empirical evidence demonstrating the positive and significant impact of labor productivity growth on bank profitability.

Bank Age

Bank age is an important determinant of profitability, as it often reflects a bank's experience, stability, and established reputation in the market. Older banks have a larger customer base, better market understanding, and stronger relationships, enhancing their ability to attract and retain clients. They also have developed risk management practices and operational efficiencies, but may face challenges like complacency or reluctance to innovate. Based on

empirical data, bank age is a positive determinant of profitability, with older banks typically expected to generate higher profits because of their established practices and reputation (Athanasoglou el aI. 2005). Several researchers indicate that bank age and profitability have a positive correlation based on their findings.

Number of Bank Branches

The number of branches can be an important factor in measuring a bank's profitability, but it is not the only metric to consider. While the number of branches can influence a bank's profitability, it is essential to consider it alongside other factors like operational efficiency, market trends, and customer preferences. Devinaga Rasiah (2010) finds out the number branch has no bearing on capture profitability.

2.1.3.2. ***External Determinants***

The factors that are outside management's control and hence external to a bank's operations are known as the external determinants of bank profitability. According to Athanasoglou et al. (2005), these elements are a reflection of the legal and economic framework that interferes with the smooth operation and performance of financial institutions. Commercial banks can incorporate flexibility into their operating plans to respond to changes in these factors, even though they have no control over these indirect factors (D. Rasiah, 2010). Macroeconomic variables and industry-specific factors are among the external factors that impact the profitability of commercial banks.

i. ***Industry Specific Determinants***

The main industry specific factors that determine a bank's profitability are ownership, regulation, and market concentration. These factors have been examined in a variety of empirical banking studies.

Ownership

Bank profitability is often influenced by ownership, with privately-owned banks often being more profitable than publicly-owned banks Athanasoglou *et al.*, (2005). However, because of tax breaks and preferential treatment, foreign-owned banks may be more profitable in developing nations and less profitable in industrialized nations (Aburime, 2008).

Regulation

Regulation plays a significant role in shaping a bank's profitability, affecting both its operations and strategic decisions. While regulation is essential for maintaining financial stability and protecting consumers, it can also impose constraints that affect a bank's profitability. Banks must navigate these regulations carefully, balancing compliance costs with the need to remain competitive and profitable in the market.

Concentration

Market concentration, a concept from the Structure-Conduct Performance Theory, suggests that it can lead to monopoly profits or collusion among firms. Market concentration and profitability are positively correlated in some studies, but negatively correlated in others (Molyneux & Thorton, 1992) and (Bourke, 1989).

ii. ***Macroeconomic Variables***

The financial services sector, which powers economic activity worldwide, is heavily dependent on banks. Macroeconomic variables play a critical role in determining bank profitability, influencing both the operational environment and the financial performance of banking institutions. Factors such as interest rates, inflation, and economic growth directly impact banks' ability to generate income. For instance, higher interest rates enhance profitability, while low rates reduce earnings. Economic growth boosts loan demand, while economic downturns cause higher default rates.

Economic Growth:

Economic growth is a crucial factor influencing bank profitability. Economic growth significantly influences bank profitability through increased loan demand, reduced default rates, and enhanced fee income. However, banks must remain alert to potential economic downturns, which can quickly reverse these benefits. In light of those benefits, economic growth as indicated by real GDP growth is predicted to have a favorable effect on bank profitability. US evidence (Neely & Wheelock, 1997), shows that bank performance is positively correlated to the countries per capita income.

Interest Rate:

Interest rates are a critical factor in determining bank profitability through their effects on net interest margins, loan and deposit dynamics, and investment strategies. Moreover, it is expected that profitability and the real interest rate will positively correlate. But, Banks must adeptly manage their interest rate risk to maintain profitability in varying economic environments, like in the lend-long and borrow-short argument.

Inflation

Inflation has been a less researched issue in bank profitability studies, but its impact depends on whether banks' operating costs raised quicker than the inflation rate. Inflation significantly impacts bank profitability through interest rate adjustments, net interest margins, loan demand, and operational costs. Inflation is predicted by bank management, and Banks need to navigate inflationary environments carefully to maintain profitability, employing effective risk management and cost-control strategies, as it shown in Perry (1992). Studies by Bourke

(1989) and Molyneux & Thorton (1992) showed a strong positive correlation between bank earnings and inflation.

Exchange rate

Exchange rates are a vital measurement factor for bank profitability, affecting transaction income, asset valuation, risk management, and competitive positioning. This influence of exchange rate is high for banks engaged in international operations or with foreign currency exposure. Banks must effectively manage their exposure to exchange rate fluctuations to sustain and enhance profitability in a globalized financial environment. Exchange rates have no effect on bank profitability in EU banks, according to Abreu & Mendes (2001), but they might not hold true in Ukraine because financial product pricing is solid.

2.2. Empirical Reviews

2.2.1. Studies in the group of Countries

Wilson and Williams (2000), analyze a sample of banks in France, Germany, Italy, and the UK from 1990 to 1996 in order to investigate the relationship between bank size and profitability. To evaluate the impact of size on profitability, they employ a range of metrics related to bank size, such as total assets, equity, and off-balance sheet value. Their models take into consideration various factors, including previous growth, bank type, and country of origin. According to the results, smaller banks in Italy typically grow more quickly than their larger counterparts. But in France, Germany and the UK, there is no discernible correlation between bank size and profitablity. Even in the absence of particular strategic advantages for individual banks, this points to a trend toward greater concentration in these banking systems.

Additional studies look at banks in different nations. Demirguc-Kunt and Huizinga (1999), for example, look into the variables influencing banks' interest margins in eighty countries, including developing nations, economies in transition, and OECD countries. Their results show a negative correlation between liquidity risk and return on assets (ROA) and a positive correlation between liquidity risk and net interest margins (NIM), as measured by the ratio of loans to total assets. Similarly, Bourke (1989) examines the factors that influence profitability on an internal and external level in twelve banks located in Europe, North America and Australia. According to his findings, ROA and the liquidity ratio—which is calculated as liquid assets divided by total assets—have a positive relationship.

Demirguc-Kunt, Laven, and Levine (2004) look into how national institutions, market structure, and bank regulations affect the net interest margins and overhead expenses of banks. Their research takes into consideration the unique features of each bank while analyzing data from more than 1,400 banks in 72 countries. The results show that higher

banking entry and activity regulations raise the cost of financial intermediation. In addition, bank margins and overhead expenses both benefit greatly from inflation. While there is a positive correlation between concentration and net interest margins, this relationship becomes less pronounced when inflation and regulatory obstacles to competition are taken into account. Furthermore, it is important to remember that bank regulations are a reflection of broader national views on competition and private property.

Athanasoglou's 2006 study analyzes industry-related and macroeconomic factors in credit institutions in South Eastern Europe from 1998 to 2002 using an unbalanced panel data model. Annual macroeconomic and bank-level data from seven South Eastern European countries are used in the analysis.in the study Bank profitability is measured by return on equity and return on assets. Liquidity, credit risk, capital sufficiency, operating expenses, management capacity, size of banks, concentration, inflation and economic activity are among the independent variables examined. Models with fixed effects and random effects were used in the analysis. The results demonstrate that all bank-specific factors have a significant impact on profitability as predicted, with the exception of liquidity. Notably, the positive effect of concentration supports the Structure-Conduct-Performance hypothesis. There was no discernible correlation among bank reform and profitability, and the findings about macroeconomic factors were not entirely conclusive.

2.2.2. **Studies in single Countries**

The majority of research on bank performance is carried out in developed countries, like the United States. This is primarily because these economies have developed financial systems, large amounts of available data, and well-established regulatory frameworks. In contrast, there is a noticeable lack of studies examining bank performance in emerging countries, where financial systems are frequently still developing and may present different dynamics and challenges. To address this gap, many literatures work presentation divided into two sections based on the aforementioned analysis: the first section will delve into US evidence, highlighting key metrics, trends, and regulatory impacts on bank performance. The second section will explore studies conducted in emerging markets, examining the unique factors that influence bank performance in these regions, such as varying economic conditions, differing regulatory environments, and developmental challenges. By contrasting these two perspectives, we can gain a more comprehensive understanding of bank performance across different global contexts.

The empirical evidence presented in the United States comes from a study conducted by Angbazo in 1997, which closely examines the various factors that influence net interest

margins for banks. This research utilizes a dataset comprising information from U.S. banks over a substantial period, specifically between 1989 and 2003. In his analysis, Angbazo employs a pooled sample approach, which allows him to aggregate data across multiple banks and time periods to draw more generalized conclusions. The findings of the study reveal that several key variables are significantly associated with the bank interest spread, indicating how much banks can earn from their lending activities compared to the interest they pay on deposits.

Notably, the research identifies a positive correlation between the bank interest spread and several influential factors. First, default risk is highlighted, meaning that as the risk of borrowers defaulting on their loans increases, banks tend to raise their interest rates, thus widening the interest spread. Second, leverage is another important factor; banks that operate with higher levels of debt relative to their equity may also experience greater interest spreads due to the increased risk associated with their financial structure. The study also emphasizes the importance of the non-interest-bearing reserves' opportunity cost. This refers to the potential earnings banks forgo by holding reserves that do not generate interest, influencing their overall profitability. Lastly, management effectiveness is cited as a critical factor; banks with more capable management teams are likely to optimize their operations better and, as a result, achieve higher net interest margins. Overall, Angbazo's research provides valuable insights into the dynamics of bank interest margins in the U.S. banking sector, illustrating how various risks and management practices can significantly influence banks' financial performance during the specified time period.

The majority of research on the variables affecting bank performance in developing nations was carried out in Tunisia (Ben Naceur and Goaied, 2001) and Malaysia (Guru et al., 2002). Ben Naceur and Goaied (2001) investigate the variables that affected the performance of Tunisian banks between 1980 and 1995. They discovered that the best-performing banks have concentrated on raising capital and labor productivity, have kept their deposit account to asset ratio high, and have built up their equity. Guru et al. (2002), aim to provide useful advice for increasing the profitability of financial institutions by identifying the elements that lead to banks' effectiveness. The factors that determine profitability can be divided into two primary categories: external factors, which include ownership, firm size, and external economic conditions, and internal factors, which include liquidity, capital adequacy, and expense management. The findings showed that one of the most important elements in clarifying high bank profitability was efficient expense management. Furthermore, in terms

of macroeconomic variables, it was discovered that inflation had a favorable effect on bank performance and that a high interest rate was associated with lower bank profitability.

In South America, researcher Márcio I. Nakane (2002) conducts a comprehensive investigation into the various factors that influence the bank interest spread specifically in Brazil. The primary objective of this study is to identify the main drivers that affect these interest spreads within the Brazilian banking sector. To achieve this, Nakane employs sophisticated panel data techniques, which allow for a detailed analysis of various influencing factors over time. The study places a significant emphasis on several macroeconomic variables, including inflation rates, interest rate volatility, levels of economic activity, and indicators derived from the CAMEL model, which assesses the soundness of banks based on Capital adequacy, Asset quality, Management quality, Earnings, and Liquidity. A notable methodological approach utilized in this research is based on a two-step method devised by Ho and Saunders (1981). This approach is specifically designed to calculate the relative importance of both macroeconomic and microeconomic elements in determining the bank interest spread. According to Nakane's research findings; macroeconomic variables are largely responsible for explaining the behavior of bank interest spreads in Brazil. This indicates that broader economic factors play a crucial role in influencing how banks set their interest rates, thereby impacting the overall financial landscape in Brazil.

Chen et al. (2001) concentrate on a thorough examination of Taiwan's banking industry from 1993 to 1999 in their study carried out in Asia. Their main goal is to recognize and comprehend the different elements that affect the net interest margins (NIM) in Taiwanese banks' operations. One of the main conclusions of their study is that the net interest margins and the ratio of liquid assets to deposits are negatively correlated. This implies that net interest margins tend to decline as the ratio of liquid assets to deposits rises, underscoring a significant relationship within Taiwan's banking operations over the given time period.

In Africa, a significant study conducted by Ferrouhi (2014b) delves into the financial performance of banks in Morocco. The research aims to uncover the various variables that influence how effectively Moroccan banks operate financially, specifically examining the period from 2001 to 2012. A particular focus of the study is the relationship between liquidity risk and the financial outcomes of these banks. To assess this performance, the researcher utilizes four key financial ratios: Return on Assets (ROA), Return on Equity (ROE), Return on Average Assets (ROAA), and Net Interest Margin (NIM). Through this analysis, Ferrouhi identifies seven principal factors that significantly impact the financial performance of Moroccan banks. These factors include the liquidity ratio, which measures the bank's ability

to meet short-term obligations; the size of the bank; the square of the logarithm of total assets, which provides insights into the scale of operations; external funding as a percentage of total liabilities, indicating reliance on outside capital; the proportion of the bank's own capital within total assets; the level of foreign direct investments; the unemployment rate within the economy; and the potential for a financial crisis.

In a subsequent follow-up study conducted by Ferrouhi in 2017, the focus shifts to understanding the long-term factors that influence the performance of Moroccan commercial banks between 2005 and 2015. Utilizing the Johansen cointegration test, which helps to identify long-term equilibrium relationships among variables, the study reveals several key elements that affect these banks' sustained financial success. The findings indicate that deposits, both short- and long-term funding liquidity, the size of the bank, as well as both internal and external funding sources, deposit interest rates, and levels of foreign direct investments all play important roles in shaping the long-term performance of Moroccan banks. This comprehensive research sheds light on the complex interplay of various economic factors and their implications for the banking sector in Morocco.

2.2.3. **Studies conducted in Ethiopia**

Empirical evidence regarding the factors influencing the profitability of Ethiopian commercial banks is somewhat limited, particularly studies that comprehensively consider both internal and external factors. Existing research in this area has often overlooked the multifaceted nature of bank profitability. In the literature reviewed for this study, profitability is determined by a combination of various influences, categorized into three main groups: industry-specific factors, bank-specific factors, and macroeconomic factors. Industry-specific factors pertain to characteristics and conditions unique to the banking sector, such as competition levels and regulatory frameworks. Bank-specific factors include elements intrinsic to the individual banks themselves, such as management practices, operational efficiency, and capital structure. Lastly, macroeconomic factors encompass broader economic indicators, including inflation rates, economic growth, and overall financial stability, which can significantly affect the profitability of banks within the Ethiopian context.

Most studies examining bank profitability in Ethiopia tend to produce similar findings, although there are some variations among them. Some of these studies specifically focus on commercial banks, while others incorporate a broader range of factors or differ in the time periods of the data they analyze.

For example, studies carried out by a number of academics, such as Belayneh (2011), Amdemikael (2012), and Habtamu (2012), demonstrate the common patterns in Ethiopian

banks' profitability while also noting distinct differences that arise from the specific methodologies and data sets employed. Additionally, studies by Samuel in 2015, Moges in 2017, and Tesfahun in 2021 further contribute to the body of knowledge on this topic, each bringing unique insights that reflect the evolving landscape of the banking sector in Ethiopia. These studies collectively emphasize the importance of considering both internal and external factors affecting bank profitability. By analyzing different periods and incorporating various influences, researchers provide a richer understanding of the dynamics at play within the Ethiopian banking industry. Despite the similarities in outcomes, the nuances in each study underscore the complexity of the factors that drive profitability in this specific context.

Belayneh (2011) and Amdemikael (2012) conducted comprehensive analyses of the determinants of profitability among Ethiopian commercial banks, utilizing panel data from seven and eight banks, respectively, over periods from 2001 to 2010 and 2001 to 2011. Their studies contributed significantly to understanding the financial dynamics within the Ethiopian banking sector during a crucial period of economic reform and growth. Following this, Samuel (2015) furthered the exploration of this topic by examining factors impacting the profitability of commercial banks in Ethiopia, using panel data from eight banks from 2002 to 2013.

The findings from these studies collectively highlight several critical determinants that positively influence the profitability of Ethiopian commercial banks. Notably, bank size emerges as a key factor, with larger banks benefiting from economies of scale, which can lead to lower costs and improved efficiency. Capital adequacy also plays a vital role, as higher capital levels not only enhance a bank's ability to absorb losses but also foster trust among stakeholders, ultimately contributing to profitability. Additionally, the correlation between real GDP growth and bank profitability underscores the importance of a robust economic environment; as the economy expands; lending opportunities increase, leading to higher revenues for banks. Income diversification is another significant factor, as banks that diversify their income streams can mitigate risks associated with dependence on a single source of revenue, thus stabilizing their financial performance.

Conversely, the studies reveal that certain variables negatively impact bank profitability. Specifically, liquidity risk poses a significant challenge; banks that maintain high liquidity may incur higher costs and reduced profitability due to the lower returns on liquid assets. In a similar vein, operational efficiency is critical; process inefficiencies can result in higher operational expenses, which immediately reduce profit margins. Interestingly, Samuel's study notes that the relationship between inflation and bank profitability is statistically

insignificant; suggesting that, within the Ethiopian context during the specified period, inflation did not exert a meaningful influence on profitability outcomes. This finding may contrast with other global contexts where inflation is a critical factor affecting financial performance. Overall, the collective insights from Belayneh, Amdemikael, and Samuel enrich our understanding of the multifaceted relationships that govern bank profitability in Ethiopia, highlighting both opportunities and challenges within the sector.

Using data from the same time period, Moges (2017) and Fesha (2018) conducted detailed studies on the factors influencing commercial bank profitability in Ethiopia. Both researchers' utilized data from 2005 to 2016, Moges' study used panel data from thirteen commercial banks, while Birhanu's study used data from eight banks. Thiers study found that Ethiopian commercial banks' profitability is positively correlated with factors such as bank size, GDP growth, and capital adequacy. Bigger banks benefit from cost savings, scale economies, and enhanced competitive advantages. Strong GDP growth leads to improved lending opportunities and increased confidence, contributing to overall profitability. The studies highlight factors affecting profitability in banks, including funding costs, operational efficiency, and liquidity risk, which can negatively impact profit margins and asset returns.

Additionally, the growth of the banking industry itself was found to contribute to increased competition, which can negatively affect profitability. As new entrants enter the market and existing banks expand their services, the pressure to offer competitive rates and services can lead to thinner margins. Together, the findings from Moges and Fesha provide valuable insights into the multifaceted dynamics that shape bank profitability in Ethiopia, underscoring the importance of strategic management and operational efficiency in navigating the challenges and opportunities within the banking sector.

Recently, studies conducted by Isayas (2022) and Wondwossen (2018) have explored the impact of both bank-specific and macroeconomic factors on commercial bank profitability in Ethiopia, offering insights into key determinants that shape financial performance in this dynamic sector. Both researchers utilized panel data but focused on different sets of banks over varying time periods. Isayas examined 14 banks from 2008 to 2019, while Wondwossen analyzed data from seven banks spanning 2006 to 2016. Isayas and Wondwossen's studies reveal that liquidity ratio, management efficiency, and leverage are key determinants of bank profitability, enhancing customer confidence and attracting deposits. Wondwossen's study shows a positive correlation between inflation and profitability, suggesting banks may benefit from rising prices. However, Isayas' findings show GDP growth positively influences profitability, highlighting the complex relationship between economic indicators and banking

performance. The studies reveal that bank size and firm age do not significantly impact profitability in Ethiopia, challenging common assumptions about their influence on financial performance.

With reference to bank ownership, Habtamu (2012) and Tesfahun (2021) used panel data to examine the variables that affect the profitability of Ethiopian private commercial banks. The two studies evaluated bank profitability using ROA and ROE. Between 2002 and 2011, a balanced panel data of seven Ethiopian commercial banks was studied by Habtamu, and between 2014 and 2019, a balanced panel data of sixteen Ethiopian commercial banks was analyzed by Tesfahun. Based on the research, banks' profitability is highly influenced by a number of factors, including capital adequacy, firm size, non-interest income, and cost of operating income, bank size, and liquidity ratio. However, there was no discernible link between inflation and bank profitability and non-performing loans. RGDP had a positive effect on profitability in Habtamu's study, but a negative effect in Tesfahun's study.

2.3. Conceptual Framework

Several empirical studies show that a wide range of factors have a major impact on commercial banks' profitability. Building on this extensive literature review, the current study identifies several potential determinants that could influence bank profitability. These factors are classified as independent variables unique to each bank and include capital adequacy, loans, efficiency ratio, liquidity management, and bank size.

Capital adequacy is a critical measure of a bank's financial stability and its ability to absorb losses; higher capital ratios generally indicate a more resilient institution, which can enhance profitability by instilling confidence among investors and customers. **Loans**, as a primary source of revenue for banks, directly impact profitability; the volume and quality of loans extended can determine both interest income and the risk of default. The **efficiency ratio** serves as an indicator of operational performance, measuring a bank’s ability to manage its expenses relative to its income; a lower efficiency ratio signifies better management of costs.

Liquidity management is another vital aspect; effective liquidity management ensures that a bank can meet its short-term obligations while optimizing its asset allocation for maximum profitability.

Bank size may also play a role, as larger institutions often benefit from economies of scale, allowing them to spread fixed costs over a larger base and potentially offer more competitive interest rates.

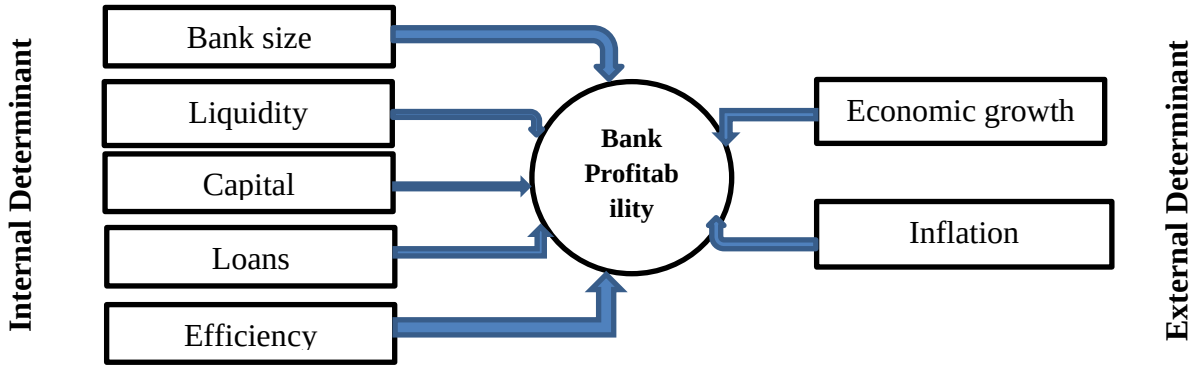
In addition to these bank-specific factors, the study also considers external macroeconomic variables such as **real GDP** and **inflation**. Real GDP growth is typically associated with

increased economic activity, leading to higher demand for bank services and improved loan performance, which can enhance profitability. Conversely, inflation can have mixed effects; while it may increase nominal interest rates and thus interest income, it can also lead to increased operational costs and reduced purchasing power, complicating its overall impact on profitability.

Return on Equity (ROE) will be the dependent variable in this analysis, and it will be used to gauge the profitability of commercial banks. ROE is a widely recognized financial metric that indicates how effectively a bank is utilizing its equity to generate profits. By exploring the relationships between these independent variables and ROE, this study aims to provide a comprehensive understanding of the factors that drive bank profitability in the current economic landscape.

Through this analysis, the study seeks to fill gaps in existing literature and offer actionable insights for bank management, policymakers, and stakeholders interested in improving financial performance within the banking sector.

Figure 1: Conceptual framework



CHAPTER THREE

3. RESEARCH METHODOLOGY

3.1. Research Design

The primary goal of this study is to determine the key variables that affect Ethiopia's commercial banks' profitability, a topic of increasing relevance in the context of the country's evolving financial landscape. Given the complexities and dynamics of the banking sector, a thorough understanding of the determinants of profitability is crucial for both practitioners and policymakers. To achieve this objective, the study utilized a quantitative approach, which allows for empirical analysis and the identification of patterns among various factors affecting bank performance. The decision to adopt a quantitative methodology stems from the need for rigorous statistical analysis to validate hypotheses related to bank profitability determinants.

The study employs an unbalanced panel data technique, which is particularly advantageous in this context, as it accommodates variations in the number of observations across different banks over time. This method enables a more flexible analysis of the data, capturing the unique circumstances and financial conditions of each institution. By leveraging panel data, the study can analyze both cross-sectional and time-series dimensions, providing a comprehensive view of how profitability is influenced by both bank-specific and macroeconomic factors.

3.2. Sampling Design

The sampling design for this study focuses on all commercial banks operating in Ethiopia that are registered with the National Bank of Ethiopia (NBE). As of 2023, there are thirty commercial banks actively engaged in banking operations across the country (NBE, 2023). This comprehensive approach ensures that the study captures a wide range of banking practices, strategies, and performance metrics across different institutions. However, it is important to note that the study excludes commercial banks established after 2021 due to their lack of adequate audited financial data. The inclusion of only those banks with sufficient historical data is crucial for conducting a robust analysis of profitability determinants. By focusing on banks that have been operating for a longer period, the study can draw more reliable conclusions based on stable financial records and performance history. As a result, samples of sixteen commercial banks were chosen. These include the Commercial Bank of Ethiopia, Bank of Abyssinia, Awash Bank, Dashen Bank, Nib International Bank, United Bank, Cooperative Bank of Oromia, Wegagen Bank, Zemen Bank, Lion Bank, Abay Bank,

Berhan Bank, Oromia Bank, Global Bank of Ethiopia, Enat Bank and Addis International Bank.

3.3. Methods of data Collection

In order to accomplish its goals and determine the variables affecting Ethiopian commercial banks' profitability, the study used secondary data sources. For bank-specific variables, the study will rely on audited financial statements from each bank, which provide reliable and standardized financial information necessary for accurate analysis. These statements include critical metrics such as balance sheets, income statements, and cash flow statements, which offer insights into the banks' financial health, operational efficiency, and overall performance. In addition to bank-specific data, macroeconomic data collected from reputable sources to contextualize the findings within the broader economic environment. This data will be sourced from reports and publications issued by the Ministry of Finance and Economic Development, as well as from the National Bank of Ethiopia. These institutions provide essential economic indicators, such as real GDP growth rates, inflation rates, interest rates, and other relevant macroeconomic variables that significantly impact the banking sector.

3.4. Methods of data analysis

This study employs a quantitative approach to analyze the factors influencing bank profitability in Ethiopia, utilizing data collected from commercial banks established before 2021. The study primarily based on panel data gathered through a structured document review process to achieve the broad research objective of understanding the factors influencing commercial bank profitability in Ethiopia. The primary data source includes financial statements from banks and macroeconomic indicators obtained from Ministry of Finance and Economic Development.

The analysis employs various econometric techniques to examine different banks over time, leveraging the strengths of panel data analysis. The dataset consists of financial performance metrics from commercial banks in Ethiopia, covering various periods and data sizes. The data collected from 16 banks over a 25 - year period (1998-2023). Key variables include return on assets (ROE) as the dependent variable, with independent variables including bank size, capital adequacy, liquidity, loan, efficiency, and macroeconomic factors such as GDP growth and inflation. In this study, an unbalanced panel data approach is utilized due to the varying operational histories of the banks included in the study. This method is particularly advantageous when the data does not span the same time frame for all entities, which is common in real-world scenarios where some banks may have recently entered the market and lack comprehensive historical data.

To understand general trends among the selected banks, a descriptive statistics analysis method is employed. Key statistical measures such as mean values and standard deviations are utilized to summarize and interpret the data effectively. The mean provides a clear picture of the average performance metrics among the banks for each variable of interest, while standard deviations quantify the variability of the data around the mean. In addition, a comprehensive approach to data analysis will be employed to evaluate the factors influencing bank profitability in Ethiopia. A multiple regression model will be utilized to assess the impact of both bank-specific and macroeconomic factors, controlling for potential confounders to ensure robust estimates. Given the panel nature of the data, both fixed effects and random effects models will be estimated, with the Hausman test applied to determine the most appropriate specification for the analysis. This methodology aims to provide a nuanced understanding of the dynamics affecting bank profitability.

3.5. Model Specification

Many studies assess bank profitability by employing various financial ratios, which provide valuable insights into the performance and efficiency of banking institutions. Among the most commonly used ratios are Return on Assets (ROA), Return on Equity (ROE), and Net Interest Margin (NIM). Return on Assets (ROA) measures a bank's efficiency in generating profits, and Return on Equity (ROE) measures a bank's efficiency in generating profits. Conversely, net interest margin, or NIM, represents the percentage of total loans and advances—which include deposits with foreign banks, Treasury bills, and other investments—that differ between interest income and interest expenses.

This study used ROE as a dependent variable to measure bank profit. ROE provides a clear indication of how effectively a bank is utilizing its equity to generate profits, making it highly relevant for investors who are interested in assessing the financial performance of their investments. Unlike other metrics, such as Return on Assets (ROA) or Net Interest Margin (NIM), which may not fully capture the impact of leverage or the specific interests of shareholders, ROE explicitly highlights the relationship between net income and equity.

The following econometric models were designed for this study in order to examine how determinant variables affect bank profitability.

$$ROE_{it} = \alpha + \beta_1 BSZ_{it} + \beta_2 LIQ_{it} + \beta_3 LDR_{it} + \beta_4 CAR_{it} + \beta_5 EFF_{it} + \beta_6 GDP_t + \beta_7 INF_t + \varepsilon_{it}$$

Whereas,

BSZ_{it} is the asset size of i^{th} bank at year t.

LIQ_{it} is the Liquidity position of i^{th} bank at year t.

LDR_{it} is loan to deposit ratio of i^{th} bank at year t.

CAR_{it} is the capital adequacy ratio of i^{th} bank at year t.

EFF_{it} is the operating efficiency of i^{th} bank at year t.

GDP_t is the Gross domestic product of country at year t.

INF_t is the inflation rate of country at year t.

ε_{it} is error term where *i* is cross sectional and *t* is time identifier.

3.6. Definition of Variables and Construction of Hypothesis

3.6.1. The dependent variable

To determine the variables affecting banks' profitability, different researchers have used a variety of proxy measures for bank profitability. The Return on Equity (ROE) has been chosen as the study's indicator of bank profitability.

Return on Assets (ROE)

The Return on Total Equity (ROE), a commonly used indicator of profitability, will be used as a dependent variable in this study to display the shareholders' earning-per-share equity ratio. ROE is calculated as net profit after tax divided by total equity.

3.6.2. Independent variables

Explanatory variables in this study were selected according to how they theoretically relate to the dependent variable.

Bank Size

The size of a bank is a significant determinant of its performance. In order to account for potential cost benefits related to a bank's size, the natural logarithm of book value of all assets is used as a proxy for measuring bank size (Sufian & Chong, 2008). The size of a bank, or its total asset value, affects its financial performance in a number of ways. When compared to smaller banks, larger banks are more efficient due to the benefit of economies of scale. Based on this, this study suggests that bank profitability is greatly and favorably impacted by bank size.

Liquidity

The ability of the company to meet short-term obligations with its liquid assets is gauged by liquidity ratios. The ratio of liquidity assets to total assets is presented in this study as measure of liquidity ratio. Companies that have more liquid assets have a lower failure rate because they can continue to make money even in difficult circumstances. A positive correlation has been observed between bank profit and the expectation that financial institutions, like banks, with more liquid assets will perform better than those with less liquid assets.

Capital adequacy

Capital adequacy is a financial institution's capacity to repay debts if individuals or organizations cannot repay borrowed funds. Banks' capacity to withstand losses is measured by the Capital Adequacy Ratio (CAR), which is the ratio of Capital to Risk Weighted Asset. The ability of the banks to settle their debts and manage operational and credit risks is standardized. A positive correlation between bank profitability and the capital adequacy ratio is anticipated in this study.

Loan to Deposit ratio

Loans are assets with risk and it is the largest segment of interest bearing assets. In this study, we use the proxy by total loan dividing to total deposits. It displays the percentage of the total deposit that is converted to loans. There is a positive correlation between bank performance and deposit conversion because, other things being equal, the more deposits that are converted into loans, the higher the level of profit. The study anticipates this outcome as well.

Efficiency Ratio

Efficiency ratios are used to assess how effectively banks operate in terms of producing non-interest revenue while keeping non-interest expenses under control. The nature of banks revenue and cost are coming from interest gain from debtor and interest paid to depositor respectively, however, this study uses the ratio of non-interest income to non-interest expense to measure operating efficiency of banks. It serves as a gauge of management's capacity to keep non-interest expenses under control in order to increase revenue through participation in non-interest income-generating activities. In the study it expects positive relation with banks profit.

Economic Growth

The real GDP growth rate is used to measure this, and it is thought to have a positive impact on banking profitability. A country's GDP is the total value of all finished goods and services produced there in a given year. In this study expects a favorable correlation between GDP and bank profitability.

Inflation

Through interest rate adjustments, net interest margins, loan demand, and operating costs, inflation has a major impact on bank profitability. A bank's profitability is affected by inflation rates when income rises more quickly than expenses, whereas a negative coefficient is anticipated when expenses rise more quickly than income. A negative relationship is anticipated in this study.

CHAPTER FOUR

4. RESULT AND DISCUSSIONS

4.1. Descriptive statistics

The results of the descriptive statistics pertaining to the independent and dependent variables used in this study, which was concentrated on a sample of banks, are presented in this part. These independent variables included the **GDP growth rate**, which reflects the overall economic performance; the **inflation rate**, indicating the rate at which the general level of prices for goods and services rises; **bank size**, measured through various metrics such as total assets; the **liquidity ratio**, which assesses the bank's ability to meet short-term obligations; the **loan to deposit ratio**, reflecting the proportion of loans given out compared to deposits held; the **efficiency ratio**, which measures the bank's operational efficiency; and the **capital adequacy ratio**, which evaluates a bank's capital in relation to its risks.

On the other hand, the Return on Equity (ROE) was the dependent variable examined in this investigation. ROE is a critical performance metric that measures the profitability of a bank relative to shareholders' equity, providing insights into how effectively the bank is generating profits from its equity capital. Together, these variables form the foundation of the analysis, allowing for a deeper understanding of the factors influencing bank performance within the sample.

Table 1 presents the findings related to the average return on equity (ROE) for the sample banks, which stands at an impressive 20.19%. This figure indicates that, on average, the banks in the study generate a return of 20 cents for every birr invested in their assets. However, it is important to note the variability within the data, as the ROE values ranged significantly from a minimum of -44.23% to a maximum of 77.71%. This broad range signifies that, while some banks experienced considerable profitability, others faced substantial losses. The negative return of -44.23% highlights instances where banks incurred losses that exceeded their equity, indicating challenging financial conditions for those institutions. Conversely, the maximum ROE of 77.71% reflects exceptional performance by some banks, showcasing their ability to generate significant profits relative to their equity.

Additionally, the standard deviation of 12.26% from the mean suggests a relatively low level of variability among the banks' returns. This low standard deviation indicates that the ROE values are clustered closely around the average, implying a level of consistency in performance across the chosen banks during the study period. Overall, the results provide valuable insights into the profitability and financial health of the banks analyzed, capturing

the wide spectrum of performance outcomes within the sample. The size of the banks was taken into consideration as one of the major components in the analysis of the explanatory variables in the study. The natural logarithm of the total assets owned by each bank was used to quantify this size, resulting in a logarithmic scale that makes comparisons between institutions of different sizes more meaningful. As shown in Table 1, it was discovered that the average value for this indicator of bank size was 8.96.

It's also critical to draw attention to the study's observed range of values. The sample consisted of smaller banks, as indicated by the minimum value of 4.33 and the maximum value of 14.08, which indicated the presence of much larger banks. This broad range demonstrates the variety of bank sizes that were considered in the investigation.

The bank size variable's standard deviation was determined to be 1.83. This figure suggests that although many banks are very similar to the average, there are also significant size variations among the institutions under investigation. It also shows a moderate degree of variability around the mean size.

Table 1 also illustrates that there is a considerable degree of variation among the sampled firms concerning their liquidity positions. This variation is highlighted by the average liquidity ratio, which is recorded at **28.62%**. This average indicates that, on the whole, these banks maintain a level of liquidity that allows them to cover approximately 28.62% of their short-term obligations with their liquid assets. The minimum liquidity ratio was noted to be **7.8%**, suggesting that some banks have relatively low liquidity positions, meaning they only have enough liquid assets to cover a small portion of their short-term liabilities. Conversely, the maximum liquidity ratio reached an impressive **93.80%**, indicating that certain banks are exceptionally well-capitalized in terms of liquid assets, allowing them to cover a high percentage of their obligations.

Additionally, the standard deviation for the liquidity ratio is calculated at **13.88**, which reflects a moderate level of variability in liquidity across the different banks. This standard deviation indicates that while many banks have liquidity ratios close to the average, there are notable differences among them. Overall, these findings highlight the varied liquidity management strategies employed by the sampled banks, revealing both conservative and aggressive approaches to maintaining liquidity in their operations.

The analysis of the Loan to Deposit ratio reveals that the average value stands at **67.48%**. This percentage reflects the relationship between the total loans issued by the banks and the total deposits they have received from their customers. Specifically, this average indicates

that, on average, the sampled banks are loaning out **67 cents** for every **1 birr** they receive in deposits.

To provide further context, it is noteworthy that there is a range of values observed within this ratio. The minimum recorded Loan to Deposit ratio was **20%**, suggesting that some banks are more conservative in their lending practices, loaning only 20 cents for every birr deposited. On the other end of the spectrum, the maximum value reached **128.57%**, indicating that certain banks are extending loans that exceed their total deposits, which may suggest aggressive lending strategies or reliance on other funding sources. These findings highlight the varying approaches taken by the banks in managing their liquidity and lending activities. The average ratio of **67.48%** indicates a balanced approach to lending, where banks are actively utilizing a significant portion of their deposits to generate loans while still maintaining a buffer for liquidity needs. Overall, this analysis provides valuable insights into the banks' operational strategies regarding their loan and deposit relationships.

A key indicator of a bank's stability and soundness financially is its capital adequacy ratio, also known as capital to risk-weighted assets. In this study, as shown in table 1, the average capital adequacy ratio among the sampled banks was found to be **42.12%**. This percentage reflects the banks' capacity to cover their risk-weighted assets with their capital, which is essential for ensuring that they can meet their financial obligations and absorb potential losses. However, it is crucial to consider the significant variability in this ratio, as indicated by a remarkably high standard deviation of **209.8** from the mean. This substantial standard deviation suggests that there is a wide range of capital adequacy ratios among the banks included in the analysis, highlighting considerable differences in their financial positions and risk management strategies.

In terms of the range of values observed, the minimum capital adequacy ratio was recorded at **9.69%**, indicating that some banks are operating with relatively low levels of capital compared to their risk-weighted assets. This could raise concerns about their ability to weather financial difficulties. Conversely, the maximum value reached an extraordinary **3733.3%**, which is indicative of a bank that is extremely well-capitalized relative to its risk exposure.

This finding implies that, on average, Ethiopian banks have a capital adequacy ratio of **42.12%**, suggesting that while they possess some capacity to repay their debts; this level may be considered insufficient. The low average indicates potential challenges in the banks' ability to effectively return the funds they have received, which could affect their overall stability and confidence among depositors and investors. Overall, the evidence suggests that more

research is necessary to determine whether these banks' capital management strategies can sufficiently support their operations and reduce risks.

Table 1: Descriptive statistic for dependent and explanatory variables

Variable	Observation	Mean	Std. dev.	Min.	Max.
ROE	314	20.19	12.26	-44.23	77.71
BSZ	314	8.96	1.83	4.33	14.08
LIQ	314	28.62	13.88	7.80	93.80
LDR	314	67.48	16.00	20.00	128.57
EFF	314	93.20	50.65	1.39	287.65
CAR	314	42.12	209.77	9.69	3733.43
GDP	314	8.16	3.31	-3.46	13.57
INF	314	15.31	11.22	-8.24	44.36

The efficiency ratio serves as an important measure for assessing the operational efficiency of banks, particularly regarding their capacity to generate non-interest income while effectively managing and controlling non-interest expenses. As it listed in table 1, in this study, the average efficiency ratio among the sampled banks was determined to be 93.20%. This statistic indicates that, on average, a considerable portion of the banks' resources is being allocated to cover expenses rather than being directed toward profit generation.

To gain a better understanding of this metric, it's essential to examine the range of efficiency ratios observed among the banks in the study. The lowest efficiency ratio recorded was **1.39%**, suggesting that some banks operate with very low efficiency, which may indicate difficulties in managing their expenses or generating adequate non-interest income. Conversely, the highest ratio reached **287.65%**, implying that certain banks are facing exceptionally high non-interest expenses in relation to their income, raising concerns about their long-term operational viability.

Moreover, the standard deviation for the efficiency ratio was determined to be **50.65**. This relatively high standard deviation signifies a considerable level of variability among the efficiency ratios of the sampled banks. It indicates that while many institutions may be grouped around the average, there are notable disparities in efficiency, with some banks performing significantly better or worse than their peers. In summary, these findings suggest that the average efficiency ratio of **93.20%** highlights ongoing challenges within the banking sector concerning cost management and income generation. The differences in efficiency

ratios imply that some banks may need to implement more effective strategies to control their non-interest expenses and improve their capacity to generate non-interest income. This observation emphasizes the critical role of operational efficiency in sustaining profitability and competitiveness within the banking industry.

Examining the macroeconomic factors during the research period, we find that the average real GDP growth rate was calculated to be 8.16%. This figure reflects a range of economic performance, with the growth rate experiencing fluctuations between a minimum of -3.46% and a maximum of 13.57%. These statistics indicate that, despite some periods of contraction, the overall trend points to economic growth throughout the timeframe under review. The standard deviation of 3.31 further highlights the variability of the growth rates, suggesting that while the economy generally expanded, there were notable deviations from the average.

In addition to GDP growth, the average inflation rate observed during this same period was 15.31%. This inflation rate also exhibited significant variability, as evidenced by a standard deviation of 11.22. The minimum recorded inflation rate was -8.24%, while the maximum soared to 44.36%. These figures illustrate the dynamic and sometimes volatile nature of inflation during the research period, indicating that the economic environment was marked by both challenges and opportunities.

4.2. Econometric Results

4.2.1. Correlation Analysis

The degree to which two or more variables are connected to one another is measured by correlation. According to Studenmund (2014), correlation values range from +1 to -1, with the sign denoting the direction in which the variables are associated. A perfect positive correlation is represented by a correlation coefficient of +1, and a perfect negative correlation is represented by a correlation coefficient of -1. On the other hand, a coefficient of 0 indicates no correlation between the variables. As illustrated in the correlation matrix analysis in Figure 2, the dependent variable—return on Equity (ROE)—shows a positive correlation with several key factors, including bank size (BSZ), efficiency (EFF), GDP, and inflation (INF). The correlation values for these relationships are 0.4451 for bank size, 0.5485 for efficiency, and 0.2335 for GDP, indicating varying degrees of strength in these associations.

Figure 2: Correlation matrix analysis result

	ROE	BSZ	LIQ	LDR	CAR	EFF	GDP	INF
ROE	1.0000							
BSZ	0.4451	1.0000						
LIQ	-0.0990	-0.6111	1.0000					
LDR	-0.2435	-0.1582	-0.3887	1.0000				
CAR	-0.4152	-0.5036	0.4337	-0.1545	1.0000			
EFF	0.5485	-0.1197	0.4504	-0.4123	0.0249	1.0000		
GDP	0.2335	-0.0825	0.2726	-0.3204	0.2673	0.3702	1.0000	
INF	0.0942	0.3849	-0.1304	0.0913	-0.0309	-0.0231	-0.0317	1.0000

The positive correlation between bank profitability and total asset size suggests that larger banks tend to have advantages that smaller banks may lack. Specifically, larger institutions can achieve economies of scale, which often leads to reduced costs per unit of service provided. Moreover, the ability of bank management to effectively control non-interest costs plays a significant role in driving revenue. When banks actively engage in non-interest income activities—such as fees from services and investment income—they can bolster their profit margins. This dynamic helps to explain the observed positive correlation between Return on Equity and the Efficiency Ratio. Furthermore, there is a strong positive correlation between GDP growth and bank profitability. This relationship suggests that during periods of strong economic expansion, banks typically experience an increase in their profits. A strong economy encourages lending and investment, which raises bank profits and income sources. The need for financial services is boosted by growing companies and more spending.

On the other hand, the analysis reveals a negative correlation between the dependent variable, Return on Equity (ROE), and two important ratios: The Loan-to-Deposit Ratio (LDR) and the Capital Adequacy Ratio (CAR). The correlation values for these relationships are -0.2435 and -0.1327, respectively. A negative correlation with the LDR indicates that as the proportion of loans to deposits increases, bank profitability may decline. This could be due to higher risk levels associated with aggressive lending practices, which might lead to increased loan defaults and, consequently, diminished returns. Similarly, the negative correlation with the CAR suggests that higher capital requirements may have an inverse effect on profitability. While maintaining adequate capital is essential for financial stability and regulatory compliance, excessively high capital ratios can limit the amount of capital available for lending and investment, thereby reducing potential profits.

Finally, it is noted that there is a statistically insignificant relationship, with a correlation coefficient near zero, between the dependent variables, namely inflation (INF), liquidity

(LIQ), and return on equity (ROE). This suggests that variations in inflation rates and liquidity do not significantly affect banks' return on equity.

4.2.2. **Diagnostic Test**

4.2.2.1. ***Test for Homoscedasticity Assumption***

When the variance of the error term in a regression model is inconsistent across all levels of the independent variable(s), it is known as Heteroscedasticity. In simpler terms, this means that the spread or dispersion of the errors varies, which can lead to inefficiencies in the estimation of the model parameters. To investigate the presence of heteroscedasticity in this study, the Modified Wald test was employed, specifically designed to assess group-wise heteroscedasticity. The testing process involves formulating two hypotheses: the null hypothesis posits that the variance of the error terms remains constant across observations, indicating no heteroscedasticity. The alternative hypothesis, on the other hand, contends that heteroscedasticity is present because there is a lack of constant variance. For this analysis, a significance level of 5% was established as the threshold for determining whether to reject the null hypothesis.

Table 2 : Output of Wald Test

Modified Wald test for group wise Heteroscedasticity	
Wald chi-square value	**839.73**
prob>chi-squere	**0.000**

Note: H0: homoscedasticity or constant variance

In this study, upon conducting the test, we observed a chi-square value of 839.37, along with a corresponding probability value (prob>chi) of 0.000, as detailed in Table 2. These results provide compelling evidence against the null hypothesis, allowing us to reject it confidently. This rejection indicates that the model indeed exhibits heteroscedasticity, meaning that the error variance is not constant across the dataset. Given the presence of heteroscedasticity, it is essential to adopt appropriate statistical techniques to address this issue. Consequently, we conclude that utilizing robust standard errors is necessary. This approach will help mitigate the impact of heteroscedasticity on our estimates, ensuring that the results of the analysis remain reliable and valid. By applying robust standard errors, we can obtain more accurate inference regarding the relationships modeled, ultimately enhancing the overall integrity of the study’s findings.

4.2.2.2. *Test for Assumption of Autocorrelation*

It is assumed that there is no correlation between the error term in one period and the error term in another. As stated in Brooks (2008), this is predicated on the idea that there is no covariance between the error components across time (or cross-sectional, for that kind of data). Autocorrelation, also known as serial correlation, occurs when the residuals (or errors) from one observation are correlated with the residuals from another observation, which can lead to biased estimates and invalid statistical inferences. In our analysis, we employed the Wooldridge (2002) test to investigate the potential presence of an autocorrelation problem within our panel data models. To formally assess this issue, we established the null hypothesis (H0) as stating that there is no first-order autocorrelation present in the panel data. The results of the Wooldridge test are presented in Table 3, where we observed an F-value of 20.57 alongside a probability value (prob > F) of 0.0003. These findings are statistically significant at the 0.05% significance level, indicating a strong likelihood that the null hypothesis can be rejected. The significant F-value suggests that there is indeed evidence of serial correlation in our panel data models. Given this outcome, we conclude that the presence of autocorrelation necessitates a careful approach to our analysis. Therefore, to address this issue effectively, we will employ robust standard errors in our estimations. Utilizing robust standard errors will help to account for the autocorrelation in the error terms, thereby enhancing the reliability of our results. The adjustment is crucial for our model to provide valid inferences about the studied relationships, thereby enhancing the robustness of our findings.

Table 3: Output of Wooldridge Test

Wooldridge Test for Autocorrelation	
F- value	**20.48**
prob>F	**0.0003**

Note: H0: no first order autocorrelation

4.2.2.3. *Unit root Test*

The term "stationary" in time series analysis describes a statistical characteristic of a variable that maintains its mean, variance, and autocorrelation structure remain constant over time. We use a unit root test, which is especially useful when examining unbalanced panel data, to determine whether the variables in our model display stationarity. Specifically, we utilize Fisher-type tests that are based on the Augmented Dickey-Fuller method. The Fisher-type unit-root test generates a test statistic, which is commonly represented as Chi-squared, along

with a corresponding p-value that helps us assess the significance of our findings. In this framework, the null hypothesis posits that all panels within our dataset contain a unit root, indicating non-stationary. The alternative theory, on the other hand, contends that at least one of the panels is stationary.

Table 4 : Output of Fisher-type unit-root Test

Fisher-type unit-root Test	**Inverse chi^2 P**		**Inverse normal Z**		**Inverse logit L***		**Modified Inverse-chi^2 P**	
	Statistic	**P-value**	**Statistic**	**P-value**	**Statistic**	**P-value**	**Statistic**	**P-value**
ROE, lags(0)	212.19	0.000	-10.626	0.000	-14.116	0.000	21.608	0.000
BSZ, lags(0)	174.74	0.000	-6.624	0.000	-9.449	0.000	17.608	0.000
LIQ, lags(0)	75.708	0.000	-2.287	0.011	-3.42	0.0005	5.057	0.000
LDR, lags (0)	27.633	0.002	1.949	0.032	1.375	0.0138	-0.772	0.009
EFF, lags (0)	39.344	0.0243	-1.208	0.013	-1.205	0.015	0.648	0.025
CAR, lags(0)	422.23	0.000	-14.29	0.000	-28.74	0.000	47.06	0.000
GDP, lags (0)	100.91	0.000	-4.832	0.000	-5.83	0.000	8.114	0.000
INF, lags (0)	61.71	0.002	-2.396	0.008	-2.234	0.014	3.36	0.0004

Note: H0: All panels contain unit roots

H1: At least one panel is stationary

Upon conducting the test, we observe that the p-value obtained is less than 5%, which is significantly lower than our predetermined significance level, as it shown in Table 4. This enables us to confidently reject the null hypothesis, which leads us to the conclusion that our unbalanced dataset exhibits stationarity in at least one panel.

4.2.3. **Model Specification Test Using Hausman Test**

We use the Hausman test, created by Hausman (1978), to compare the various model types and decide which model is best suited for the study. The Hausman test is a crucial statistical tool used to determine the appropriate model specification for panel data analysis, specifically when deciding between fixed effects and random effects models. The alternative hypothesis (H1) contends that there is a significant difference, while the null hypothesis (H0)

typically asserts that there is no significant difference between the observed and expected frequencies. We can reject the null hypothesis and determine that there is a significant difference between the observed and expected frequencies if the p-value is smaller than the selected significance level. On the other hand, we can accept the null hypothesis and come to the conclusion that there is no significant difference if the p-value is higher than the significance level.

The Hausman test results, as presented in Table 5 (Appendix I), show a Chi-square value of 11.24 with a corresponding prob>chi2 value of 0.0812. Since this p-value is greater than the 0.05 significance level, we do not reject the null hypothesis of the Hausman test. This implies that there is no significant difference between the estimates obtained from the fixed effects and random effects models for our study. Consequently, we can conclude that the random effects model is appropriate for this analysis, suggesting that the unobserved individual effects are not correlated with the explanatory variables. This finding supports the validity of using a random effects approach in our modeling, providing a more efficient estimation of parameters while accounting for the potential variability across panels.

4.2.4. **Result of the Regression Analysis**

A detailed summary of the results of the regression analysis that was performed on the bank's profitability as the dependent variable and seven other independent variables is given in this section. To find important predictors that influence the bank's financial performance, we statistically look at the correlations between these independent variables and the profitability measure. Random-effects Generalized Least Squares (GLS) is a statistical method used to analyse this studies unbalanced panel data, which consists of observations across multiple entities (such as individuals or firms) over time, but with varying numbers of observations for each entity. In addition, Random-effects Generalized Least Squares (GLS) technique is an efficient estimator that considers individual-specific effects and potential error terms, especially in unbalanced panels with missing data points.

When analysing unbalanced panel data, the z-statistic is frequently used in Random-effects Generalized Least Squares (GLS) to evaluate the significance of estimated coefficients. The p-value associated with the z-statistic indicates the probability obtaining a z-satistics as extreme as observed value, under the null hypypotsesis. If the p-value is smaller than the selected significance level, the relationship is considered statistically significant and the null hypothesis is rejected. In another way for Significance levels the larger absolute value of z-statistic is the stronger the statistical significance of the relationship.

The regression outputs in show that the constant term's intercept, or β0, can have a positive or negative value. The expected value of the dependent variable is represented by this value when all other independent variables, including the error term, equal zero Studenmund (2014). In a similar manner, the beta coefficients, or slopes, may be positive or negative, denoting the nature of their association with dependent variable. When the independent variable rises, a positive sign indicates that the dependent variable will also rise. A negative sign suggests that the dependent variable will likewise decrease when the independent variable does. The slope coefficient determines how a 1% increase in the regulator will affect the profitability of commercial banks assuming all other factors remain constant.

In a Random-effects Generalized Least Squares (GLS) model, the chi-square value is used to assess the overall fit of the model, this also known as the Wald chi-square statistic. In addition, at the 5% level of significance, the chi-square value indicating the combined or overall significance of all independent variables is statistically significant in explaining the variation in ROE, which measures the profitability of Ethiopia's commercial banks.

Table 6 : Output of Random-Effects GLS regression Test

Random-Effects GLS regression				
Variable	Coefficient	Robust Std. Err.	Z - statistics	Prob. of Z
BSZ	3.9927	0.4879	8.18	0.000 ***
LIQ	-0.03189	0.0769	-0.41	0.679
LDR	0.13052	0.0423	3.09	0.002 ***
EFF	0.16437	0.0207	7.93	0.000 ***
CAR	0.00376	0.0019	1.97	0.048 **
GDP	0.32077	0.1282	2.50	0.012 **
INF	-0.14656	0.0367	-3.99	0.000 ***
_Cons	-39.4045	7.9077	-4.98	0.000 ***
Within R-squared	0.539			
Between R -squared	0.738		Wald chi2(7)	1120.11
Overall R-squared	0.600		Prob > chi2	0.0000
Note	*** , Indicates Significant at 1%*			
	** , Significant at 5%*			

The following is the statistical framework that was utilized to predict the independent variables' outcomes based on the GLS model regression outputs:

ROE = -39.404 + 3.993 BSZ - 0.032 LIQ + 0.131 LDR + 0.0037 CAR + 0.164 EFF + 0.321 GDP - 0.146 INF + εit

4.2.4.1. ***Discussion of the Regression Result***

Return on Equity (ROE), a key indicator of commercial bank profitability, is examined in this section along with the effects of independent factors. The results are compared with initial

hypotheses to validate findings and identify discrepancies. The results of the regression were examined in relation to the hypothesis that was anticipated and previous studies.

Bank Size (BSZ)

As showed in table 6, Bank Size, measured by logarithm of total asset variable in the GLS regression results for Ethiopian commercial banks reveals significant insights into its impact on profitability, as indicated by the coefficient value and p-value. The coefficient of 3.9927 suggests that, holding other factors constant, an increase in bank size is associated with an approximate increase of 3.99 units in the Return on Equity (ROE). This positive relationship implies that larger banks tend to exhibit greater profitability, potentially due to their ability to extend loans and advances, engage in riskier activities and enhanced operational capabilities. Furthermore, the p-value of 0.000 indicates a highly statistically significant relationship, providing strong evidence to reject the null hypothesis that posits no effect of bank size on profitability. Furthermore, the economies of scale theory—which holds that larger companies have a cost advantage over smaller ones—is supported by the positive correlation between size and profitability, which implies that mergers in Ethiopian banking could result in higher profits. In an unstable economic climate, merging banks can draw in more clients and boost earnings because a bank's size directly affects its standing and dependability.

The findings of Goddard et al. (2004) in European banks, Indranarain R. (2009) in Taiwanese banks, Devinaga Rasiah (2010) in Malaysia, and Ferrouhi (2017) in Moroccan banks are all consistent with the result of positive relation between bank size and profitability. Studies on Ethiopian bank profitability, including those by Amdemikael (2012), Samuel (2015), Moges (2017), Wondwossen (2018), Tesfahun (2019), and Isayas (2022), have also found evidence supporting the positive relationship between bank size and profitability.

Liquidity Ratio (LIQ)

Liquidity position is measured by the ratio of the liquidity asset to total asset. In table 6, the coefficient of -0.032 indicates that an increase in the liquidity ratio is associated with a decrease in profitability, specifically a reduction of approximately 0.032 units in Return on Equity (ROE) for each unit increase in liquidity ratio. However, the p-value of 0.679 is significantly greater than the conventional significance level of 0.05, indicating that this relationship is not statistically significant. This means that we do not have sufficient evidence to conclude that liquidity ratio has a meaningful impact on profitability in this Ethiopian commercial Banks.

Loan to Deposit Ratio

The percentage of a bank's loans financed by its deposits, or the loan to deposit ratio, has a statistically significant and positive correlation with the profitability of banks. Strong evidence that the loan-to-deposit ratio has a significant impact on bank profitability is indicated by the p value of 0.002 being statistically significant at the 5% level of confidence and the coefficient 0.131 showing that, all other things being equal, a higher loan-to-deposit ratio is associated with higher bank profitability, as it shown in table 6. A higher loan-to-deposit ratio typically means that a bank is making larger loans against its deposits, which may result in increased interest income and even higher profits. A higher LDR indicates that the bank is making better use of its deposit base to produce assets that yield interest, which can enhance profitability and performance in general.

In summary, the positive relationship between loans to deposit ratio and bank profitability driven by the ability of banks to generate higher interest income from loans funded by deposits, leveraging their deposit base. However, banks need to manage their LDR within prudent levels to maintain a balance between profitability and risk. This finding aligns with the research conducted by banking experts, including Devinaga Rasiah (2010), S. Chaudhary (2009), M. Abreu and Y. Mendes (2002), Athanasoglou et al. (2006), Abreu & Mendes (2000), Sehrish et al. (2011), and Moges (2017), which all demonstrate a positive correlation between loan amount and profitability.

Capital adequacy ratio

According to the result of Random-effects GLS regression in table 6, Capital adequacy ratio is positively related with ROE and statistically significant at 5%, the coefficients is 0.00376 and its p-value is 0.048. This indicates that, while keeping other independent variables constant, return on equity (ROE) increases by 0.376 for every 1% increase in capital adequacy (CAR). This is consistent with the notion that banks in a strong capital position are better able to seize business opportunities and have more time and flexibility to deal with problems that may arise from unforeseen losses. Furthermore, it implies that Ethiopian commercial banks with adequate capital have lower bankruptcy costs, which lowers funding costs and lessens the banks' dependency on outside funding, ultimately increasing the banks' profitability. The study supports previous research indicating a positive correlation between capital adequacy and financial institution profitability, as well as findings by Guru et al. (2002), Ferrouhi (2017), Amdemikael (2012), Fesha (2018) and Tesfahun (2019).

Efficiency Ratio

Another significant variable is Efficiency ratio which is Non-interest income to Non-interest expenses ratio found statistically significant and positively related with ROE, with coefficient value of 0.164 and p-value of 0.000, as it shown in table 6. This ratio evaluates the banks' capacity for revenue diversification and the level of cost control practiced by the management. It is thought that banks with better cost management would have higher returns because better cost control is indicated by higher ratios. Financial institutions in this operation mostly make money from non-interest sources like fee-based services. This positive relationship with profitability is consistent with the previous studies Angbazo (1997) in US Bank evidence, Athanasoglou (2005) in Greece Banks, Indranarain R. (2009) in Taiwan Banks, Moges (2017) in Ethiopian Banks.

Real Gross Domestic Product growth rate (GDP)

One macroeconomic variable used in the study to evaluate how the state of the economy influences the profitability of commercial banks is GDP growth rate. Table 6 shows, GDP and profitability have a positive correlation, and the p-value of 0.012 suggests that, at the significant level of 5%, GDP has a statistically significant impact on commercial bank profitability. The coefficient of 0.321 in the regression output signifies a positive relationship between GDP and Return on Equity (ROE) for Ethiopian commercial banks. Specifically, this coefficient suggests that for every one-unit increase in GDP, we can expect a corresponding increase of approximately 0.321 units in ROE, indicating that economic growth directly contributes to the profitability of banks.

Ethiopia's economic growth could boost its banking sector's profitability, as increased transactions, improved asset quality, and increased demand for financial services could lead to higher returns on equity, highlighting the interconnectedness of economic growth and financial sector performance. The finding is supported by researches of Athanasoglou (2005), Flamini, (2009), Demirguc-Kunt (2011), (Neely & Wheelock, 1997), Belayneh (2011), and Isayas (2022).

Inflation

According to the result of Random-effects GLS regression in table 6, the Inflation variable result of p-value of 0.000 suggest that there is strong evidence to reject the null hypothesis, meaning that inflation is indeed a significant factor affecting bank profits. The negative coefficient of -0.146 indicates that there is an inverse relationship between inflation and bank profitability. Specifically, for every one unit increase in inflation, bank profitability is expected to decrease by 0.146 units, all else being equal. This suggests that higher inflation

negatively impacts the ability to banks to generate profits. The study's results imply that inflation has a significant and adverse effect on bank profitability, highlighting the importance of managing inflationary pressures to maintain healthy profit levels in the banking sector. The findings of Samuel (2015) in Ethiopian banks evidence support this negative relationship between inflation and bank profitability.

CHAPTER FIVE

5. CONCLUSION AND RECOMMENDATION

5.1. Conclusion

The purpose of this study was to investigate the major variables that impacted the profitability of Ethiopian commercial banks from 1998 to 2023. The researchers used return on equity (ROE) as a regressed indicator of profitability in relation to several internal and external variables. The analysis's findings make it clear that a number of variables, including GDP, bank size, loan-to-deposit ratios, capital adequacy, efficiency ratios, and loan-to-deposit ratios, all positively and statistically significantly impact the profitability of Ethiopia's commercial banks. However, while liquidity has no statistically significant impact, inflation has a negative impact on profitability.

The study reveals a strong positive relationship between bank size and profitability in Ethiopian commercial banks, suggesting that larger banks benefit from economies of scale and that mergers can enhance profitability. The liquidity ratio, crucial for operational stability, did not significantly impact the profitability of Ethiopian banks, despite its importance. The loan-to-deposit ratio positively correlates with profitability, enabling banks to efficiently utilize deposits, increasing interest income and overall profitability, but prudent management is crucial to balance risk. The capital adequacy ratio positively impacts ROE, indicating banks with adequate capital can seize opportunities and mitigate risks, enhancing profitability. The efficiency ratio significantly influences profitability, emphasizing revenue diversification and cost control. The study found a positive correlation between GDP growth and bank profitability in Ethiopia, indicating that sustained economic development could enhance bank profitability. Inflation negatively impacts bank profitability, it emphasizing the need for effective inflation management to safeguard bank profitability.

5.2. Recommendation

Based on these findings, it is recommended that Ethiopian commercial banks consider strategic mergers to increase their size and enhance profitability. Additionally, banks should focus on optimizing their loan-to-deposit ratios while maintaining a balanced approach to risk management. Strengthening capital adequacy is also crucial for improving resilience and capturing growth opportunities.

Moreover, banks should implement efficient cost management practices to improve their efficiency ratios and diversify revenue streams beyond traditional interest income.

Policymakers should work towards fostering a stable economic environment to support GDP growth, while actively managing inflation to safeguard the profitability of the banking sector. These strategies collectively could help enhance the overall performance and stability of Ethiopian commercial banks in the long run.

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APPENDIX

Appendix –I (Table 5): Output of Huasman test Result

```
. hausman fe re

                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |       fe           re         Difference          S.E.
-------------+------------------------------------------------------------
         BSZ |     3.83679     4.042749       -.2059595        .1279158
         LDR |    .1690312     .1489061        .0201251        .0147684
         EFF |     .167786      .164012         .003774        .0045183
         CAR |     .003434     .0034161        .0000179        .0002611
         GDP |    .3239826     .3228197        .0011629        .0357094
         INF |    -.125744    -.1428726        .0171286        .0097012
------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(6) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =       11.24
                Prob>chi2 =      0.0812
```

Appendix-II: Regression Results for Determinants of Ethiopian Commercial Banks Profitability

```
. xtreg ROE BSZ LIQ LDR EFF CAR GDP INF, re robust

Random-effects GLS regression                   Number of obs     =       314
Group variable: bank_code                       Number of groups  =        17

R-sq:                                           Obs per group:
     within  = 0.5391                                         min =         9
     between = 0.7384                                         avg =      18.5
     overall = 0.6004                                         max =        26

                                                Wald chi2(7)      =   1120.11
corr(u_i, X)   = 0 (assumed)                    Prob > chi2       =    0.0000

                              (Std. Err. adjusted for 17 clusters in bank_code)
------------------------------------------------------------------------------
             |               Robust
         ROE |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         BSZ |    3.992708   .4879528     8.18   0.000     3.036338    4.949078
         LIQ |   -.0318893   .0769568    -0.41   0.679     -.182722    .1189433
         LDR |    .1305187   .0423039     3.09   0.002     .0476046    .2134328
         EFF |    .1643717   .0207198     7.93   0.000     .1237616    .2049817
         CAR |    .0037665   .0019083     1.97   0.048     .0000262    .0075067
         GDP |    .3207689    .128189     2.50   0.012      .069523    .5720148
         INF |   -.1465581   .0367605    -3.99   0.000    -.2186074   -.0745088
       _cons |   -39.40445   7.907721    -4.98   0.000     -54.9033    -23.9056
-------------+----------------------------------------------------------------
     sigma_u |   .63845362
     sigma_e |   7.4686689
         rho |   .00725455   (fraction of variance due to u_i)
------------------------------------------------------------------------------

.
```