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DETERMINANTS OF COMMERCIAL BANK PERFORMANCE: A CASE STUDY IN SELECTED EAST AFRICAN COUNTRIES

BY:

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DECLARATION

I, Yonas Gashaw declare that this thesis is my original work, prepared under the guidance of Dr. Temesgen Worku. I prepared, collected, analyzed and finished this thesis in accordance with all the scholarly ethical standards. All academic information used in this thesis has been acknowledged through citations. Additionally, I affirm that I have followed all rules governing academic honesty and integrity and that I have not created or manipulated any ideas or data in my work. This thesis is being submitted in partial fulfilment of Addis Ababa University's Master of accounting and finance requirement. I further confirm that this thesis has not been submitted either in part or in full to any other higher learning institution for the purpose of earning any degree.

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Statement of Certification

This is to certify that this study, "DETERMINANTS OF COMMERCIAL BANK PERFORMANCE: A CASE STUDY IN SELECTED EAST AFRICAN COUNTRIES", undertaken by Yonas Gashaw for the partial fulfillment of Masters of accounting and finance at Addis Ababa University, is an original work and not submitted earlier for any degree either at this University or any other University, and has been supervised in accordance with university policies, and the student has my permission to submit it for evaluation.

Research Advisor: Dr. Temesgen Worku

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Date 24/07/2024

DETERMINANTS OF COMMERCIAL BANK PERFORMANCE: A CASE STUDY IN SELECTED EAST AFRICAN COUNTRIES

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Approval Sheet

As members of the Board of Examining for the Final master of accounting and finance thesis Defiance, we certify that we have read and assessed the study prepared by Yonas Gashaw entitled DETERMINANTS OF COMMERCIAL BANK PERFORMANCE: A CASE STUDY IN SELECTED EAST AFRICAN COUNTRIES", and we recommend that the thesis be accepted as satisfying the requirement for the Degree of Master of Art in Accounting and Finance.

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Acronym

CAR: Capital Adequacy Ratio

CI: Confidence Interval

FE: Fixed Effects (Regression Model)

F-stat: F-statistic (for testing overall significance of the regression model)

GDP: Gross Domestic Product

LDR: Loan to Deposit Ratio

NIM: Net interest margin

OLS: Ordinary Least Squares

P-value: Probability Value (used in hypothesis testing)

R-sq: R-squared (Coefficient of Determination)

Std. Err.: Standard Error

T-stat: t-statistic (for testing the significance of individual coefficients)

Abstract

The main objective of commercial banks is profit maximization because commercial banks are Business institutions established for generating profit. Hence, this study examines determinants of commercial banks performance case study in selected east African commercial banks. The data covered the period from 2018-2022 G.C. for the sample of selected fifty commercial banks. Quantitative research approach and explanatory research design were adopted in carrying out this research. Secondary data were collected from the selected fifty commercial banks using a purposive sampling technique and macro- economic data were collected from NBE and World Bank report while internal factor data were collected from audited financial statements. The study used both descriptive and inferential statistics. Mean and standard deviation were used as descriptive statistics, whereas correlation and panel regressions were used from inferential statistics using stata. The results of the regression analysis demonstrate that, while liquidity and bank size have considerable negative effects on NIM, inflation, the loan to deposit ratio, and income diversification have significant positive effects. This study suggests that banks can enhance their stability and performance by implementing several key strategies. Enhancing the loan-to-deposit ratio can improve asset utilization and profitability. Promoting income diversification allows banks to mitigate risks associated with reliance on a single income source. Prudent liquidity management ensures banks can meet short-term obligations without compromising financial health. Optimizing bank size can lead to economies of scale and better resource allocation. Monitoring inflation trends helps in adjusting interest rates and maintaining purchasing power. Lastly, policy support for economic stability, such as regulatory measures and fiscal policies, creates a conducive environment for sustainable banking operations.

Keywords: Commercial banks, bank performance, East Africa, profit maximization, income diversification, liquidity management, bank size, inflation trends, economic stability;

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CHAPTER ONE

INTRODUCTION

1.1 Background of the study

The banking sector is a vital component of the financial systems in developing countries. Financial performance of banks not only serves as an indicator of their profitability but also influences the overall economic growth rate of the country. The banking sector in east African countries is an essential component of the economy, contributing to GDP growth, creating job opportunities and promoting financial inclusion. The financial performance of banks serves as an important indicator of the overall health of the financial system in these countries. (Levine, 2005)

The banking industry in East Africa experienced significant growth over the past few years, with an increase in the number of banks and branches. However, the industry continues to face various challenges, including the low level of financial inclusion, inadequate regulations, and stiff competition (Beck, Senbet, & Simbanegavi, 2015; IMF, 2016; World Bank, 2020). Consequently, there is an urgent need to investigate the key determinants of banks' financial performance in East Africa to identify potential solutions that can enhance their profitability and sustainability (Allen et al., 2014; Kasekende, Bagyenda, & Brownbridge, 2011).

Numerous elements, including bank size, capital sufficiency, liquidity risk, credit risk, bank structure, inflation, economic growth, and others, have an impact on financial performance. While some of them affect profitability negatively, others might have a more favorable effect. Bank-specific factors (indigenous) as well as macroeconomic factors (exogenous) can affect banks' profitability (Athanasoglou, Brissimis, & Delis, 2008).

Bank earnings, as mentioned in Flamini et al. (2009), are a significant source of equity, particularly if they are reinvested back into the company. Safe banks should result from this, and as a result, big profits may help to maintain financial stability. However, excessive profitability is not always a good thing. According to Garcia-Herror et al. (2009), excessive profitability, particularly by big banks, may be a sign of market dominance. Because banks with significant market power may offer lower returns on deposits while charging higher interest rates on loans,

this could hinder financial intermediation. In turn, excessively poor profitability could deter private agents (depositors and shareholders) from conducting banking activities, which would prevent banks from attracting enough capital to function. Additionally, this can mean that only banks with low capital ratios serve as intermediaries for savings.

Alemayehu Geda (2006) contends that gathering resources—particularly local savings—and distributing them to possible investors is one of financial organizations' primary goals. Additionally, Bobakova (2003) proposes that any bank's primary objectives should be to maximize earnings, hold onto market share, and carry out additional business operations.

Commercial banks rely heavily on their profitability for long-term sustainability. This is primarily because profitability serves as the lifeblood of these institutions, enabling them to cover operational expenses incurred in the course of conducting their banking activities (Ongore and Kusa, 2013). These operational costs encompass a wide range of expenses, including but not limited to staffing, infrastructure maintenance, technology upgrades, and regulatory compliance.

Moreover, profitability plays a crucial role in rewarding the shareholders of commercial banks for their investment. It is through the generation of profits that shareholders receive dividends, providing them with a return on their investment (Ongore and Kusa, 2013). This dividend income serves as a powerful incentive for shareholders to continue investing in the bank, thereby ensuring a steady influx of capital. This, in turn, bolsters the bank's financial stability and enhances its ability to sustain operations over the long term.

By effectively managing profitability, commercial banks not only ensure their own survival but also contribute to the broader stability of the financial system. A financially robust banking sector is better equipped to withstand economic downturns and shocks, thereby safeguarding the interests of depositors, borrowers, and other stakeholders. Ultimately, the sustainability of commercial banks hinges on their ability to generate profits consistently and prudently allocate them to support ongoing operations and future growth initiatives. It's crucial to understand that businesses typically continue operating with the expectation of generating profits from their activities. Consequently, if management determines that achieving this goal is not feasible, their only recourse is often to cease operations and exit the business to prevent incurring losses (Ayanda, Christopher, & Mudashiru, 2013). Ongore and Kusa (2013) emphasize that profit

stands as the paramount objective for commercial banks, with all strategies and activities geared toward attaining this overarching goal.

They made it clear, although, that this does not imply that commercial banks or any other type of business organization are not driven by other purposes and aims; rather, they are driven by objectives like social as well as economic advantages.

Profitability, as defined by Ayanda (2013), is the capacity of an organization to sustain its profits over time. Similarly, according to Podder (2012), a commercial bank's profitability reflects its efficiency in generating earnings. This aspect of profitability extends beyond the individual organization, significantly impacting the broader economy.

Researchers highlight that the profitability of commercial entities contributes to a country's economic development by enabling reinvestment of profits into the business, thereby creating additional employment opportunities and generating increased tax revenue through income and corporate taxes (Ayanda et al., 2013). Additionally, profitability leads to enhanced wealth for investors through higher dividends, ultimately improving the overall quality of life and living standards within the country (Ongore and Kusa, 2013).

1.2 Statement of the problem

It is crucial for the banking sector to establish a secure, effective, and dependable infrastructure that improves the efficiency of monetary policy and widen public access to financial services in order for East African countries to realize its aim of becoming a middle-income country. The banking sector is a key financial service sector supporting development plans through intermediating movement of funds from surplus unit to those who are in need of it and supporting financial and economic policies. Banks facilitate smooth money transfers between individuals and businesses, economic growth, and the creation of jobs through loans and investments. In essence, a community's banks serve as its economic engine (Hoenig, 2010).

When it comes to the payment system and/or other functions, one bank has strong connections with other banks. The performance of other banks and the nation's economy as a whole are also impacted by the failure of a single bank, in addition to its shareholders and depositors. One of the

best example is the global recession that occurred by the failure of banking business. Therefore, the performance of banks must be of great importance to the government of any nation.

For a bank to continue operating, for its shareholders to get fair returns, and for management as it ensures that solid decisions are made even in the setting of a hazardous economic climate, profitability is essential.

Because it fortifies its capital position and enhances future profitability through the deployment of retained earnings, profitability acts as a hedge against unforeseen losses.

In addition to generating profit, a healthy and successful banking industry is better equipped to endure possible risks and add to the stability of the financial system. According to the Harker and Zenios (1998) analysis, a bank's performance depends on its environment, strategic decisions, and strategy execution. As a result, the performance of such banks' competitive strategies and other managerial practices might ensure that their profitability differs from other banks operating in a comparable macroeconomic setting. Consequently, the bank's size, asset growth, risk management quality, market share, capital structure, and concentration index may all be considered as comparative advantages. Therefore, in empirical studies, key explanatory factors of banks' performance should be extracted. Because of this, academic research, bank management, and bank supervisors are all interested in learning more about the factors that affect bank performance.

Previous studies have primarily focused on individual countries within East Africa or other developing regions, such as Ethiopia, Kenya, and Tunisia, examining various factors influencing bank profitability. For instance, studies like Rao and Tekeste (2012) and Ongore and Gemechu (2013) have explored internal determinants like capital adequacy and asset quality, while others such as Kapur and Abebaw (2012) have highlighted differences in performance between public and private banks within specific national contexts. However, there remains a notable gap in the literature regarding a comprehensive, cross-country analysis covering multiple East African nations using recent data spanning from 2018 to 2022. This study seeks to address this gap by investigating the relationship between macroeconomic and bank-specific factors and the profitability of commercial banks across five East African countries. By analyzing data from up to fifty banks, including both public and private institutions, this research aims to identify key

drivers of profitability such as size, capital adequacy, loan to deposit ratio, risk management practices, income diversification, and the impact of inflation and economic growth. Through this comprehensive approach, the study aims to contribute significantly to the understanding of banking sector dynamics in East Africa, thereby informing policy makers, bank management, and academics about strategies to enhance financial stability and promote sustainable economic growth in the region.

1.3 Research Questions

The following are the basic research questions that this paper aims to answer:

- What are the firm specific factors that influence the financial performance of commercial banks in East Africa?
- What are the macroeconomic factors that have an impact on the financial performance of commercial banks in East Africa?

1.4 Objective of the Study

The broad objective of this study is examining the impact of bank-specific, and macroeconomic bank profitability determinants in East African commercial banks.

1.4.1 Specific objectives

Specifically, this study addresses the following objectives;

1. To investigate how firm-specific factors affect East African commercial banks' performance
2. To evaluate the macroeconomic factors which influence the financial performance of the commercial banks in east Africa

1.5 Significance of the study

The significance of this study is considerable..

- It can be used as feedback for the central banks as well as commercial banks in East Africa mainly in Ethiopia to improve their area of weaknesses;
- It can serve as a resource for anyone interested in conducting study in the field;

- It might be helpful for the discovery of the performance measures for East African commercial banks in relation to those factors the researcher employed in profitability measurements.

1.6 Scope of the study

This study aims to investigate the determinants of financial performance in East African banks for the period 2018 to 2022, with a particular focus on **Kenya, Uganda, Tanzania, Rwanda and Ethiopia.**

Selecting the years 2018 to 2022 for this study on East African banking sector profitability offers significant advantages. This timeframe ensures the analysis incorporates recent economic conditions, regulatory changes, and recovery efforts post-global financial crisis. By focusing on these years, the study aims to provide timely insights into how macroeconomic factors and bank-specific dynamics influence profitability across five East African countries. This approach not only facilitates a comparative analysis but also enables the assessment of the effectiveness of recent monetary and fiscal policies in enhancing financial stability and economic growth in the region.

Therefore, measuring performance (profitability) is limited to one indicator- net interest margin, and seven explanatory variables. The study limits the number of variables to seven since most literature concentrates on these factors and data availability. For example, credit risk is not included in the study because data on non-performing loans and loan loss provisions are confidential.

1.7 Limitation of the Study

This study aims to investigate the factors influencing liquidity in East African commercial banks using a quantitative approach with secondary data. Constraints in time, resources, and data availability limited the scope of the study to a sample of fifty selected commercial banks. The inclusion of all commercial banks across East Africa was hindered by data availability and time constraints, posing challenges to achieving comprehensive generalization of findings regarding factors affecting profitability in the region. Additionally, variations in regulatory frameworks among the countries studied may have impacted the uniformity and comparability of data."

1.8 Organization of the study

This study is structured into five comprehensive chapters, each comprising distinct sections and sub-sections to ensure a thorough exploration of the research topic. Chapter one serves as the cornerstone, presenting the introductory framework for the entire paper. Chapter Two delves into a meticulous review of pertinent analytical and empirical studies, providing a robust foundation for the subsequent analysis. Chapter Three meticulously outlines the methodology employed in this study, elucidating the approach taken to gather and analyze data. In Chapter Four, the findings of the study are rigorously analyzed and discussed, shedding light on key insights gleaned from the research. Finally, Chapter Five encapsulates the study's conclusions and recommendations, offering valuable policy implications and delineating avenues for future research endeavors.

CHAPTER TWO

LITERATURE REVIEW

2.1 The Importance and Impact of Profitability in the Banking Sector

Profitability, a key financial metric, measures the extent to which a firm or business can generate income relative to its revenue, expenses, and other costs incurred during a specific period. It is often expressed in terms of profit margins, such as net profit margin, operating profit margin, and return on assets. High profitability indicates efficient management and a strong potential for growth and investment. As a fundamental indicator of financial health, profitability serves as a critical benchmark for investors, stakeholders, and management in assessing the operational success and viability of a company (Brealey, Myers, & Allen, 2019).

The importance of profitability extends beyond individual firms to the broader economy. Profitability drives business expansion, innovation, and employment, contributing to economic stability and growth. Profitable companies can reinvest their earnings into new projects, technologies, and human resources, fostering a cycle of growth and development. For investors, high profitability represents a lower risk and a higher potential for returns, making profitable firms more attractive for investment (Ross, Westerfield, & Jaffe, 2018). Furthermore, profitability ensures that businesses can meet their financial obligations, thereby reducing the risk of default and enhancing overall economic confidence.

In the banking sector, profitability is of paramount importance due to its direct impact on a bank's stability and capacity to lend. Profitability ensures that banks have sufficient capital buffers to absorb potential losses, meet regulatory capital requirements, and sustain long-term growth. It also affects a bank’s ability to offer competitive interest rates and develop new financial products and services. Profitability influences banks' capacity to expand their operations, enhance customer services, and invest in technological advancements, which are essential for maintaining a competitive edge in the financial industry (Berger, 1995).

In East African commercial banks, profitability is influenced by a combination of firm-specific factors, such as asset quality and management efficiency, and macroeconomic conditions,

including interest rates and economic growth. Understanding these factors is crucial for enhancing the financial performance and resilience of banks in the region. Research has shown that effective management practices, sound risk management, and favorable economic conditions contribute significantly to the profitability of banks (Athanasoglou, Brissimis, & Delis, 2008). By focusing on these areas, East African banks can improve their profitability, ensuring their ability to support economic development and financial stability in the region.

2.2 The Role of Banks

In addition to examining the subject of why banks exist, this paragraph explores the function of banks in the economy. The explanation is first extremely obvious and straightforward: banks serve as a middleman between those who have money to spare and people who don't need it. But there could be a more thorough explanation if we examine this question in more detail. According to Modigliani-Miller (1958), banking institutions are unnecessary in a perfect capital market since organizations may borrow and save money directly through the capital market. As a matter of fact, a perfect market does not exist; capital markets are distorted by transaction and monitoring expenses. The information asymmetry and the agency problem are additional issues that the financial markets face. The link between a principal and an agent—who is designated as the agent by the principle—is the foundation of agency theory. The agent will act in an opportunistic manner, especially if their interests contradict with those of the principal, according to assumptions underlying agency theory (Mitchell &Meacheam, 2011).In a larger sense, the agency problem relates to the divergent motivations of agents and principles. It also refers to the divergent incentives of borrowers and savers (Jensen &Meckling 1976). Borrowers are only held partially accountable in cases of financial difficulty, which suggests that they have incentives to change their behavior by accepting greater risk than savers are prepared to tolerate. For people, keeping track of the conduct of the borrowers is time-consuming, difficult, and expensive. Financial intermediation is often advantageous in inefficient markets because banks, as a result of economies of scale and scope, have lower monitoring and transaction costs than individuals.

The maturity transformation function is a crucial component of banking. Short-term funds made by depositors are converted by banks into long-term loans to borrowers. Banks might withstand daily withdrawals from depositors by retaining a portion of the short-term deposits in cash and liquid assets. The distinctive service provided by banks is long-term lending while ensuring the

liquidity of their obligations to depositors, who can withdraw their funds at any moment without experiencing a loss in nominal value (Schooner &Talyor 2010 cited in van Ommeren 2011).

Bank operations nowadays are more varied than ever. Recent decades have seen a rise in competitiveness and the emergence of new activities. Receiving deposits and granting credit in traditional banking has lost some of its significance. Since then, both the complexity of the balance sheet and that of risk management have expanded (van Greuning&Bratanovic 2009 cited in van Ommeren 2011). In addition to include liquidity, pricing, and credit risks in their operations, banks are increasingly exposed to market risks (e.g. risk associated with interest rates and currencies). To prevent bank failure or financial difficulty, one may presume that risk managers for banks adequately diversify these risks and actively watch borrowers' conduct. Yet, moral hazard concerns necessitate bank behavior monitoring in order to protect the continuity and stability of the banking industry.

2.3 Theories of bank profitability

In the late 1970s and early 1980s, the performance of banks was studied using two industrial organization models: the Efficiency Structure theory and the Market Power theory (Athanasoglou et al. 2006).

Consequently, in the parts that follow in this particular section, each of the aforementioned concepts as well as others relating to bank profitability and its drivers are discussed in detail..

The market power theories

According to Tregena (2009), the market power theory states that the sector's market structure has an impact on the efficiency of banks. Within the framework of market power theory, there are two distinct approaches: the Structure-Conduct-Performance (SCP) and Relative Market Power (RMP) hypotheses. According to the SCP technique, the degree of market concentration in the banking sector creates the possibility of bank domination, which might boost their profitability. No matter how efficient they are, banks in more concentrated markets are more likely than those in less concentrated markets to produce "abnormal profits" by raising lending rates and lowering deposit rates as a result of monopolistic or collusive practices (Tregenna 2009). Unlike the SCP, the RMP hypothesis claims that market share has an impact on bank

profitability. It is based on the false premise that the only banks that can influence pricing and increase profits are big ones that provide unique products. Their control of the market enables them to make profits that are not competitive (Tregenna 2009).

The efficiency theory

Conversely, the efficiency hypothesis posits that banks' substantial profits are attributable to their heightened efficiency. Two distinct approaches that come within the efficiency category are the Scale-efficiency and X-efficiency theories. According to the X-efficiency technique, companies that are more successful have lower expenditures because they are more efficient.

Although there is no correlation between market concentration and profitability, these companies often increase their market shares, which might lead to higher levels of market concentration (Athanasoglouet al. 2006).

Variations in production technology or management are not as important as economies of scale in the scale approach. Through economies of scale, larger enterprises may achieve lower unit costs and higher profits. According to Athanasoglou et al. (2006), this allows large companies to increase their market share, which might eventually result in more concentration and profitability.

The balanced portfolio theory

The portfolio theory approach is the most relevant and important one when it comes to studies of bank performance (Nzongang & Atemnkeng 2006). According to the asset diversification Portfolio Balance Model, the best way for a wealth holder to hold each asset in their portfolio depends on the choices they make regarding policy, which are influenced by a number of variables such as the portfolio's size, the risks involved in owning each financial asset, and the rates of return on each investment. It implies that actions taken by bank management determine the planned diversity and composition of the portfolios of commercial banks. Moreover, the possibility for earning maximum profits is impacted by the management's assessment of a feasible set of assets and liabilities as well as the unit costs incurred by the bank in constructing each asset component (Nzongang & Atemnkeng, 2006).

Risk-return trade off theory,

In this regard, the equity to asset ratio is a significant balance sheet ratio that has drawn a lot of attention. The balance sheet structure may also have an impact on banks' profitability. Theoretical theories of this ratio posit varying signals of the profitability connection. The market value of a bank is unrelated to its capital structure, which includes both debt and equity financing, as per the Modigliani & Miller theorem (Modigliani & Miller 1958). There is no correlation between finance costs or profitability and the equity-to-asset ratio in this scenario. However, Modigliani & Miller's ideal market is distorted by transaction costs and information asymmetry, since the agency problem was already covered in this chapter. Therefore, there may be an explanation for a bad relationship when the ideal market does not hold true. According to financing theory, entities would only take on more risk when projected returns will grow; otherwise, taking on more risk has no advantages. Increasing risks may be achieved by increasing leverage and reducing the equity-to-asset ratio (raising leverage). The risk-return trade-off is the name given to this theoretical justification (van Ommeren 2011).

There are also theoretical explanations for the opposite relationship that a higher equityto-asset ratio has a positive effect on profitability. The signaling and bankruptcy cost theories serve as the foundation for these ideas. According to the first theory, a larger equity ratio indicates to the market that a bank is valuable (Berger 1995b). Banks with lower profitability are unable to generate this kind of signal since it would worsen their financial results. In this way a lower leverage, indicates that banks perform better than their competitors who cannot raise their equity without further deteriorating the profitability. The latter theory proposes that a bank should retain greater equity to avoid a time of suffering when bankruptcy costs are unexpectedly large (Berger 1995b).

2.4 Factors affecting bank profitability

Theoretically, internal and external variables make up the two primary groups of factors influencing bank profitability. The internal (bank-specific) aspects have associated with strategic decisions and internal effectiveness. Efficiency and portfolio theory are largely predicated on the idea that internal factors pertaining to managerial choices and internal efficiencies impact bank performance, as was said in the section above. These variables include things like bank capital,

bank size, asset quality, diversification of revenue, risk associated with liquidity, and operational efficiency (expenses management). However, the market power hypothesis makes the assumption that external market conditions determine bank profitability. The macroeconomic factors that can affect bank profitability include factors such as GDP, money supply growth, and inflation rate among others.

2.5 Bank performance

From a public or market perspective, improved bank performance enhances reputation and image. The performance of banks is heavily discussed in economic literature and is measured in terms of competition, concentration, efficiency, productivity, and profitability (Bikker and Bos, 2006). Earnings, effectiveness, risk-taking, and leverage continue to be the primary drivers of banks' performance (ECB, 2010). There isn't a comprehensive, widely used indicator of success for financial organizations like banks in the literature. As an alternative, several scholars have tried to quantify empirical variables impacting banks' performance using financial data. Profit is primarily what drives bank management. Profitability is a sign of the bank's capacity to compete in the banking industry and of the caliber of its management, assuring the stability of the banking system. Banks generate profit by borrowing funds at a cost from depositors and lending those funds to borrowers while charging customers for a variety of services. Profitability is the efficiency of banks at producing earnings and will be assessed by profitability measures (Hubbard, 2002)

There are three categories of factors that affect bank performance: macroeconomic, industry-specific, and bank-specific. Bank size, capital sufficiency, operational effectiveness, liquidity, loan deposit ratio, and income diversification are examples of bank-specific indicators. Bank-concentration and bank size system are the standard metrics for industry-specific representation employed in the various research. The important macroeconomic factors, however, also include inflation and GDP growth.

Bank Performance Indicators

Different bank performance indicator metrics have been reported in different literatures. In most banking literature, such as Rao&Tekeste (2012), Ongore and Gemechu (2013), Alper and Anbar (2011), Athanasoglou, et. al., (2005), Alexiou and Sofoklis (2009), and Sufian and Chong

(2008), one, two, or all three of the alternative metrics (ROA, ROE, and NIM) were most frequently utilized when examining the variables that affect the bank's performance. Based on annual accounting data, all three of these common metrics of profitability are examined in this study in a manner akin to that of (Ameur and Mhiri, 2013). Athanasoglou (2006), states that each ratio examines a different component of bank performance.

Return on Asset

Return on Assets (ROA) gauges overall profitability and illustrates how well an institution uses its total assets to create income, as well as the profit margin (Brealey et al., 2006). Net profit after tax is divided by total assets to determine ROA. This ratio, which shows the returns produced from the assets the company has, is perhaps the most significant when assessing the effectiveness and financial success of banks. In other words, it demonstrates how effectively the company's resources are employed to create profits. A greater ROA indicates that the firm is more efficient with its resources.

Return on Equity

The other financial measurement used to assess a bank's performance is its return on equity (ROE), which shows how profitable a bank was in relation to the total amount of invested shareholder equity or found on the balance sheet. It also indicates how well the bank's management was utilizing shareholder capital. The ratio of net profits to total equity is known as the return on equity. A company with a high return on equity is likely to be able to produce cash internally. Therefore, the greater the company's ability to generate profits and the more skillfully the management uses the capital of the shareholders, the higher the ROE.

The ratio of assets to equity (ROE) is the product of ROA and the equity multiplier, quantifying financial leverage. The equity multiplier represents the leverage or financing practices, or the debt-to-equity ratio that the bank management employed to support the bank, whereas the ROE–ROA connection essentially shows the basic tradeoff that banks confront between risk and return. Athanassoglou (2005) asserts that an ROE-based analysis overlooks the leverage concerns, which are typically caused by regulation. Nonetheless, Staikouras and Wood (2011) argue that ROE is a useful profitability statistic and that the off-balance sheet industry makes a

substantial contribution to the total profit of many European banks. The ROA denominator does not reflect the earnings from these ventures.

For two main reasons, ROA is the most appropriate metric for assessing bank profitability, according to Rivard and Thomas (1997). One explanation is that ROA is not skewed by large equity multipliers, and another is that ROA accounts for differences in the absolute amount of profits that might be associated to size (Guru et al., 1999).

Net Interest Margin

Finally, the NIM variable's primary focus is on the profit generated by interest-related operations. Net interest income is calculated by dividing the total earning assets (which include foreign bank deposits, Treasury bills, other investments and bonds, various debtors and other debit balances, and total loan advances) by the total interest income. It calculates the difference between the interest revenue banks make and the interest they pay on borrowed money in relation to the total value of their interest-earning assets. In other words, NIM calculates the difference between the interest income the bank earns from securities and loans and the interest it pays on the money it borrows, all based on the average amount of assets that create earned revenue for the bank during that time period. The NIM focuses on the profit made on lending, investing, and funding operations, whereas the ROA evaluates the profit gained on assets and indicates how successfully bank management employs the bank's actual investment resources. It shows the cost of bank intermediation services as well as the effectiveness of the bank. A higher net interest margin boosts the bank's stability and profitability. However, higher net interest margins may indicate riskier lending practices together with significant loan loss provisions..

The issue with financial ratios, especially ROA and ROE, is that equity and asset total values may fluctuate over time, making it inappropriate to compute the ratios using simply the balance at the conclusion of stock or asset operations. Therefore, to record changes in assets over the fiscal year, average values of consecutive year-end balance sheet numbers are often utilized. NIM (net interest margin) is therefore, utilized to evaluate the profitability of East African commercial banks in the study, following in the footsteps of other research (Kosmidou, 2008; Dietrich and Wanzenried, 2009) and accounting for the profitability indicators of commercial banks.

2.5.1 Bank Specific Variables

Bank Size

Logarism of total assets is used to calculate bank size. Size is taken into account in the regression as an equivalent of bank size to account for any potential cost savings brought about by economies of scale. Divergent relationships between profitability and size are found in the literature. Large banks likely profit from having a more varied investment portfolio than smaller banks do.

A favorable correlation between bank size and profitability is anticipated because diversification lowers risks and economies of scale boost operational efficiency by minimizing expenses (Rao & Tekeste, 2012 and Alper & Anbar, 2011). However, as bank branches diversify, for example, operating costs might increase and the variable can have unfavorable impacts. Sufian and Chong, 2008; Ameur and Mhiri, 2013. Theoretically, one cannot predict how a bank's growth would affect its profitability (Ongore and Kusa, 2013; Dietricha and Wanzenriedb, 2009). According to scholarly research, the predicted sign of the bank size coefficient is therefore uncertain. To reflect the possible non-linear influence of size, this research employed the logarithm of total asset, much as Athanasoglou et al. (2008) Alexiou and Sofoklis (2009).

Capital Adequacy Ratio (CAR)

The equity-to-asset ratio, or capital adequacy, measures a bank's financial strength or capital structure. It is one of the special factors unique to each bank that influences the bank's profitability. A high capital adequacy ratio boosts depositor safety in uncertain macroeconomic times by demonstrating the bank's internal resilience to losses during a crisis. A bank with a larger equity to asset ratio would often require less outside funding, hence a large amount of equity is believed to lessen bank risk and raise a bank's creditworthiness in decreasing its funding cost. Lower capital ratios in the banking industry, however, are indicative of more risk and leverage, which raises the cost of borrowing. Regressions examining the relationship between profitability and bank capitalization include the CAR variable (Dietricha and Wanzenriedb, 2009). It is favorably correlated with profitability, according to most research findings. (Ameur and Mhiri, 2013, Ongore and Gemechu, 2013, Athanasoglou et al, 2005; Sufian and Chong, 2008; Rao & Tekeste, 2012). Ayanda ET al. (2013), among others, on the other hand, reported

adverse relationships. The diluting effect is anticipated to provide a negative association, particularly when compared to ROE.

Liquidity Risk

An indicator of liquidity is the ratio of assets that are solvent to the total assets. Commercial banks must maintain a minimum amount of liquid assets in addition to maintaining a cash reserve with the Central Bank, as inadequate liquidity is a primary cause of bank failures. When commercial banks struggle to handle high demand (withdrawals), they may have a liquidity imbalance. Banks could be compelled to borrow more money or sell off some of their liquid assets in such a scenario. Short-term borrowing is typically expensive, and the revenue lost from the sale of liquid assets will typically have a negative impact on profitability. However, the profitability of banks with excess liquidity may also be negatively impacted by idle money and reduced returns on liquid assets. Liquidity, then, may have both positive and bad effects, and managing it is yet another crucial factor that affects how profitable commercial banks can be (Rasiah, 2010).

Income diversification (DIV)

Non-interest income is an additional source of revenue apart from loan earnings. One important source of revenue for banks is non-interest income from off-balance sheet sources like letters of credit (Rasiah, 2010). As a stand-in for income diversification onto non-traditional activities, the regression analysis uses the ratio of non-interest income over average assets. Service fees, commissions, guarantee fees, net profit from the sale of investment securities, and foreign exchange profit are examples of non-interest income. By diversifying their sources of revenue, bankers have discovered a potential way to improve the income statement. It is anticipated that the variable will show a positive correlation with bank profitability.

Loan to Deposit Ratio (LDR)

Since loans represent a bank's main business, they are the most significant performance indicators in the bank financial statements. Presuming all other factors remain constant, the profitability will increase with the rate at which deposits are converted into loans. For that reason, it is anticipated that the loan deposit ratio and bank profitability will positively correlate.

Conversely, if an increase in loans results in an increase in financing needs, the loan ratio may have a negative effect on the profitability of the bank (Alexiou and Sofoklis, 2009; Ana et al., 2011).

2.5.2 Macroeconomic Determinants

GDP

Banks do not increase at the same rate as the GDP throughout time. GDP growth is expected to have a beneficial impact on bank profitability, according to the research on the link between economic growth and financial sector profitability (Demirguc-Kunt and Huizinga, 1999; Bikker and Bos, 2006; Athanasoglou et al., 2006). Because of this, we anticipate a positive correlation between GDP growth and bank profitability as long as loan demand is rising or falling during cyclical upswings or downswings.

BenNaceur and Goaid (2005), however, contend that GDP growth is neither a reliable indicator of the sophisticated technology used in the banking industry or of the regulations governing it. On the other hand, Staikouras and Wood (2003) discover that while the level of interest rate has a favorable influence on bank performance, the variability of interest rate and GDP growth have a negative impact on two of their three macroeconomic indicators.

Inflation (INF):

Inflation is the overall pace at which prices for goods and services are increasing and, consequently, buying power is declining. It is also known as the persistent rate of depreciation of the purchasing power of a unit of local currency over time. Continually compounding rate basis (differences in natural logarithms) or as an annual percentage rise as seen in the Consumer Price Index are used to quantify this (CPI). A certain amount of inflation is an unavoidable part of life. Excessive rates of inflation have a detrimental effect on actual economic growth, which further impairs the state of the economy as a whole.

One of the microeconomic determinants is inflation, which is assessed by the annual nation inflation rate and is used to illustrate changes in the overall level of prices or inflationary circumstances in the economy. In Europe, there is a negative correlation between the rate of inflation and bank profitability, as shown by Abreu and Mendes (2000). Similarly, from 1995 to

2005, inflation had a detrimental impact on Tunisian bank profitability, according to Ayadi and Boujelbene (2012). Similarly, Demirguc-Kunt and Huizinga (1999) opine that high capital ratio banks in developing nations typically have lower profitability in inflationary markets.

2.6 Empirical Literature

The study "Determinants of Profitability of Commercial Banks in a Developing Country: Evidence from Ethiopia" was carried out by Rao and Tekeste (2012) using unbalanced panel data of Ethiopian commercial banks from 1999/00 to 2008/09. The return on average asset (ROA) of the banks was regressed in the study against seven internal and three external components, which represent indicators of bank profitability. The study's conclusion demonstrates that all of the internal factors used in the analysis—the equity to asset ratio, non-interest income to total income, bank size, and other factors—have a positive and significant impact on banks' profitability in Ethiopia. The loan loss reserve to total loans is found to have a negative impact on banks' profitability, albeit one that is statistically insignificant. Liquidity and operational efficiency also have a negative impact on banks' profitability. Nevertheless, it is shown that GDP, concentration, and inflation are not statistically important external influences. My study is different from the above one since it collects and analyzes data from five different countries in east Africa and takes a time frame of 2018 to 2022.

Using two public and six private commercial banks as a sample, Kapur and Abebaw (2012) undertake an empirical investigation on the effect of ownership structure on the performance of Ethiopian commercial banks between 2001 and 2008. The research employed both parametric and nonparametric tests to look at the link and identify the various performance attributions in their ownership patterns. According to the results, private sector banks outperformed their public counterparts in terms of profitability as shown by ROA and NIM. The researchers came to the conclusion that banks in the private sector are more adept at making profitable interest-earning investments and at efficiently utilizing their assets. In addition to being more profitable, private sector banks outperformed publicly owned banks in terms of credit management, which shows how well they assess and allocate resources to worthwhile initiatives. The study demonstrates that private banks are capable of covering unexpected operating losses, as evidenced by the much higher capital adequacy in the private sector, which is measured by the ratio of capital to net loans. However, compared to private sector banks, public banks were far better at cost

management strategies because they may maintain a lower cost-to-asset ratio. When it came to personnel, general, and noninterest expenditure management, public sector banks did better than private ones. On the other hand, there was no discernible difference in liquidity between public and private sector banks. My analysis differs from Kapur and Abebaw's because it has a broader reach, includes data from recent times, and incorporates up to fifty banks from five different countries.

In order to determine the explanatory determinants of banks' performance on 10 commercial banks in Tunisia between 1998 and 2011, Ameur and Mhiri (2013) took into account macroeconomic, industry-specific, and bank-specific factors. The empirical result of the GMM estimator approach indicates that banks have a high degree of performance persistence. The results therefore imply that the best management efficiency and bank capitalization have a favorable and noteworthy impact on the performance of Tunisian banks. On performance, however, concentration and bank size have a negative and huge impact. Though, other from inflation, which appears to have a negative impact on banks' net interest margin, macroeconomic variables have little bearing on how well banks operate.

Ongore and Gemechu (2013) estimated the factors influencing the financial performance of Kenyan commercial banks using panel data and a linear multiple regression model with generalized least squares. With the exception of the liquidity variable, their findings indicate that several criteria, including capital sufficiency, asset quality, and managerial efficiency, have a substantial impact on the performance of Kenyan commercial banks. It was shown that there was a negative association with asset quality but a positive correlation with capital sufficiency and management effectiveness for bank performance. On the other hand, the overall influence of macroeconomic factors was not evident, and there was no indication of a significant impact of ownership identity on the financial performance of commercial banks. Even if it turns out that GDP and performance metrics are negatively correlated, there is little evidence of this link. Multiple regression analysis was used by Azam and Siddiqui (2012) to examine both internal and external factors influencing the banking sector in Pakistan. The study compares the profitability of international and domestic banks and examines the factors that influence their profitability during the quarterly period of 2004 to 2010; it concludes that foreign banks have distinct profitability drivers and are more profitable than all domestic banks combined. Research results

show that foreign banks make more money in Pakistan than local banks do, and that their profitability is less affected by the macroeconomic environment of the country. They conclude that, with a few notable exceptions, locally owned commercial banks in Pakistan outperform foreign-controlled ones in terms of earnings per share at the profit volume level. Overall capital efficiency is better among Pakistani commercial banks under foreign ownership than among those under local administration.

In Alkhatib (2012), the financial performance of five Palestinian commercial banks listed on the Palestine Securities Exchange was to be experimentally examined. Three indicators have been used to quantify financial performance in this paper: return on assets, which is an internal indicator; Tobin's Q model, which is a market indicator based on price / book value of equity; and economic value add, which is an economic indicator based on price In order to determine the effects of bank size, credit risk, operational efficiency, and asset management on the financial performance indicated by the three indicators, the study used correlation and multiple regression analysis of annual time series data from 2005 to 2010. It also created a well-fitting regression model to forecast the financial performance of these banks in the future. The results suggest that while asset management and operational efficiency alone have a major influence on ROA, when combined with bank size and credit risk, they have a large additional impact on Tobin's Q and EVA.

San1 and Heng (2013) conducted a study to explore how specific factors related to banks—such as liquidity, credit, capital, operating expenses, and the size of commercial banks—affect their performance. The performance was assessed using return on average assets (ROAA) and return on average equity (ROAE). The findings indicate that these ratios impact the performance of banks in China and Malaysia differently, with the exception of credit and capital ratios. In particular, operating expenses ratios significantly influence the performance of Chinese banks but do not have the same effect on Malaysian banks, regardless of the performance measure used.

Alper and Anbar (2011) examined the factors influencing the profitability of commercial banks in Turkey from 2002 to 2010, focusing on both bank-specific and macroeconomic determinants. They used return on assets (ROA) and return on equity (ROE) as the dependent variables to analyze bank profitability. Their research found that asset size and non-interest income positively

and significantly affect bank profitability. Conversely, the size of the credit portfolio and non-performing loans negatively and significantly impact profitability. Among the macroeconomic variables, only the real interest rate positively affects bank performance. These findings suggest that Turkish banks can enhance their profitability by increasing their asset size and non-interest income, reducing the credit-to-asset ratio, and benefiting from higher real interest rates.

2.7 Conclusion and Knowledge Gap

Commercial banks are the cornerstone of all nations' financial systems and play a significant role in economic growth. Therefore, achieving this healthy and consistent profitability is a crucial concern. Effective asset and liability composition of commercial banks is essential for their stable financial performance, as the literature study covered in this chapter demonstrates.

Based on the above discussion and empirical review the researcher realized that there is a limited research papers on the area.

In addition, this research has a scope of east African level this makes it different and enables to compare, find out and investigate areas to improve across the countries in scope.

While many researchers focus on one country this research focuses on the portion of the continent Africa that will provide insights for banks as well countries.

Many of the researches focus on the country level bases this type of research can't be used to compare with other countries and recommend trends from other countries.

2.8 Conceptual Framework

A conceptual framework, according to Camp (2001), is a structure that the researcher believes best describes how the subject of the study emerged spontaneously. It has to do with the concepts, important theories, and empirical research that structure and bolster the data that the researcher presents (Peshkin, 1993). It provides a description of how the researcher explored the study problem. The conceptual framework provides an integrative view on a topic under study, claim Liehr and Smith (1999). The conceptual framework clarifies the relationships between a study's main topics from a statistical perspective. To help give an image or visual representation of how concepts in a study connect to one another, it is organized logically (Grant &Osanloo,

2014). Lushe, Mennecke, and Townsend (2012) state that the framework makes it easier for the researcher to define and explain the concepts included in the study's topic. The main variables or constructs to be examined and the assumed relationships between them can be shown in a conceptual framework "graphically or in a narrative form," according to Miles and Huberman (1994, p. 18).

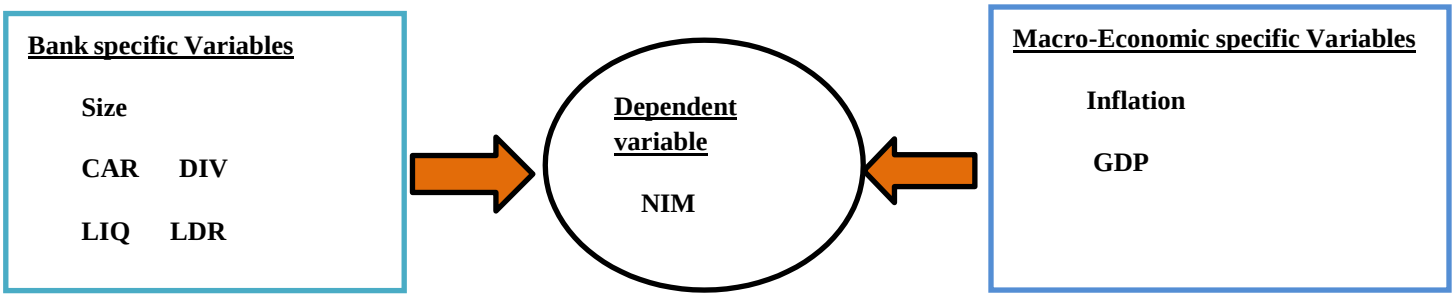

Figure 2.2 Conceptual framework

CHAPTER THREE

RESEARCH METHODOLOGY AND DESIGN

3.1 INTRODUCTION

Research Method: the main objective of this chapter is to go over the approaches used throughout the study to achieve its objectives. The exact procedures or methods used to find, select, process, and analyze information about a topic are known as research methodology. It is a means of outlining a researcher's intended method of investigation. Explanatory study methodology was used in a quantitative research strategy to investigate the cause and effect relationships between variables. Data for this study comprises only secondary data, audited financial statements particularly balance sheet and income statement or profit and loss statement, obtained from each selected commercial banks. The purpose of this chapter is to present the research approach, variables and hypotheses, and to briefly indicate what type of data used, from where data is collected, and how pertinent data is gathered and examined in order to fulfill the goals of the study.

3.2 Research Design

A research design outlines our approach to addressing the research questions. As described by Creswell (2009), it serves as a strategic framework for conducting research, guiding how empirical data are utilized to tackle the research problem. Key elements of a research design include defining study objectives, selecting a suitable research methodology, determining sample techniques or selection criteria, outlining data collection procedures, and specifying data analysis methods. Shona (2021) emphasizes that researchers critically evaluate existing data and information to inform their analysis. Research designs can be categorized into descriptive, explanatory, or exploratory types depending on their goals. Descriptive research focuses on describing and comparing people, groups, institutions, procedures, and materials to understand current conditions. In contrast, explanatory research seeks to establish causal relationships between variables. Given the aim of establishing causal links in this study, an explanatory research design was employed.

3.3 Research Approach

There are three main types of research methodologies: quantitative, qualitative, and mixed methods (Creswell, 2014). Creswell explains that a quantitative approach involves testing hypotheses through data collection and statistical analysis to confirm or disprove the hypotheses. This approach examines data from measuring attitudes using statistical techniques and assumption testing. In contrast, the qualitative method focuses on understanding the significance of a phenomenon from the participants' perspective and tracking it over time. A mixed-methods approach combines both quantitative and qualitative techniques, involving logical and theoretical bases. Data collection in mixed methods often involves observing participants' behavior during activities (Creswell, 2014). For this study, the quantitative research approach was deemed appropriate. The quantitative approach is based on the assumption that the characteristics of the social environment create an objective reality that is largely consistent over time and location (Gall, 1996). The general methodology involves describing and explaining this real-life feature by collecting numerical data on observable behaviors and subjecting this data to statistical analysis. This study requires such an approach. Quantitative studies also test theories a priori from existing knowledge by developing hypothetical relationships and proposed outcomes. To achieve this, the research approach uses a review of existing literature to deductively develop theories and hypotheses to be tested, transforming the research problem into specific variables (Yesegat, 2009). Quantitative research methodologies test the theoretically established link between variables using sample data, aiming to statistically generalize for the population under study. Due to the quantitative nature of the data and the researcher’s preference for secondary data, a quantitative research approach was adopted.

3.4 Population and Sampling Frame

The study's population includes all commercial banks operating in East Africa. According to the World Population Review, there are twenty-one countries in East Africa, and five of these were chosen for this research based on several criteria: representative coverage, ensuring the sample captures a broad range of banking performance determinants; diversity of economies, where the selected countries represent various economic environments, from more developed banking sectors in Kenya to emerging markets in Rwanda (BNR Economic Review, 2021, Vol. 18); and geographic distribution, including banks from different geographic areas within East Africa,

which allows the study to generalize findings to the entire region. Additionally, the countries' strategic importance was considered, focusing on economic significance, as these nations are key players in the East African Community (EAC), an intergovernmental organization aimed at economic integration (German Federal Ministry for Economic Cooperation and Development [BMZ], 2009-2014), and financial hub status, particularly Kenya, which serves as a financial hub in East Africa (Smith, 2021), influencing banking practices and performance metrics in neighboring countries. Lastly, the availability of data was a crucial factor, with these countries generally having more accessible and reliable financial data, essential for robust research, and relatively well-established regulatory environments, allowing for better comparison and analysis of banking performance. From these five countries, the researcher selected 50 commercial banks.

3.5 Sampling Technique

The researcher used purposive (judgmental) sampling for this study, a non-probabilistic sampling technique. According to Saunders, Lewis, and Thornhill (2012), purposive sampling involves selecting elements for the sample based on the researcher's judgment. This technique is used when the population size is large, to select members of a specialized, difficult-to-reach population, and to identify specific types of respondents for in-depth investigation. Considering the need for full data access for the selected time period, the large population size, and time and resource constraints, purposive sampling was used.

3.6 Sample Size

For this study, fifty commercial banks were selected based on specific criteria. Firstly, the banks had to be commercial banks operating in the selected East African countries: Kenya, Uganda, Tanzania, Rwanda, and Ethiopia. Secondly, there had to be adequate and reliable data available on their official websites.

3.7 Source and Tools/Instruments of Data Collection

Data gathered from the website of each bank is a major source for this study. It is a secondary type and includes annual financial statements of all banks. Additionally, data from the banker, World Bank, National bank of Ethiopia and other reports were used.

3.8 Methods of Data Analysis

When a researcher wants to make sense of a big amount of data and derive conclusions about variables related to any issue, quantitative methods of data analysis may truly help. This study employed STATA to describe the summary results in numerical terms with a predefined degree of confidence since user-friendly statistical tools such as Eviews, SAS, SPSS, and STATA are best suited for quantitative data analysis procedures.

3.9 Panel Data

According to Gujarati (2011), generally there are three types of data available for analysis: time series data, cross sectional data and pooled or panel data. Time series data as its name implies it is a set of observations collected at different times for one variable such as daily, monthly or yearly. Contemporarily cross sectional data is a data collected on one or more variables at one point in time. A type of data that has features of both time series and cross sectional data is called panel data; simply it is a type of data collected for many variables at different time periods.

The pooling of observations from several units (countries, banks, groups of individuals, etc.) on the same set of variables over a number of time periods is referred to as panel data. As a result, the researcher decided to do econometric modeling using a panel data analysis. A particular kind of pooled data called panel data is made up of observations made on the same cross-sectional or individual units throughout a number of time periods. Therefore, panel data include both time and space aspects. While using panel data has many advantages, it also has certain drawbacks. The benefit of utilizing panel data, as mentioned in Baltagi (2005), is that it manages individual heterogeneity, reduces collinearity across variables, and follows patterns in the data, which simple time-series and cross-sectional data cannot. Panel data are more suitable to examining the dynamics of change since they examine the repeating cross section of observations (Gujarati, 2009).

3.10 Ethical Consideration

The researcher first took into account ethical concerns that were relevant to each stage of the investigation and that were predicted, discussed, and documented in this thesis. The research's findings primarily benefit the banks that were the subject of the study and serve as informational

resources for others. Additionally, the researcher makes an effort to avoid manipulating or fabricating data, data gathering techniques, or copying other people's work. Lastly, took the greatest steps to prepare for ethical actions, such as taking on a meaningful professional role and internalizing awareness to ethical problems.

3.11 Econometric methodology

3.11.1 Empirical Specification and Estimation

This section introduces the methods used for the empirical analysis to identify the factors that affect performance East African Commercial banks. As a result, it is necessary to estimate the relationship shown below using panel data made up of data from fifty banks throughout the years 2018 to 2022.The model question is

$$Yit = \alpha + \beta Xit + \varepsilon it \quad \text{.....(1)}$$

In this case, α stands for the intercept, β1, β2….βn The regression coefficients for the explanatory variables X1, X2, and so on are represented by β therefore, the equation for Xn to estimate Yit may be expressed as follows:

$$Yit = \alpha i + \beta 1 BSit + \beta 2 Macroit + \varepsilon it \quad \text{.....(2)}$$

Where, Yit is an index of Performance represented by NIM, BS is symbol of bank specific variables, and Macro is symbol of macroeconomic variables they are thought to gauge performance level. ε is the error term, and αi is the unobserved macro and bank-specific time; invariant effect that permits variability in the means of the Yit series across banks.

3.12 Data Analysis Methods

The panel data used in the study was gathered through structured document inspection. To accomplish the study's goal, the data entered into the Stata program was examined using regression analysis and descriptive statistics. Regression analysis, which is the most crucial component of the analysis, helps to discover and determine variables' effects as well as establish relationships between dependent and independent variables. Descriptive analysis deals with the descriptions of variables. A variety of specification tests have been performed to verify the assumptions of the traditional linear regression model, and Pearson's correlation matrix test is

utilized to determine the link between each variable and the dependent variables: Tests for heteroskedasticity, autocorrelation, multicolinearity, and normality are conducted in conjunction with a fixed effect or random effect model test, depending on which is most suited for the analysis (Malhotra, 2007). In order to assess the impact of factors that affect the profitability of particular East African commercial banks, the study's Fixed Effects model was finally used. The effect of each explanatory variable on profitability assessed using the statistical significance of the 'βs' coefficient. Estimated coefficients were considered statistically significant using 1%, 5%, and 10% significance levels, a calculated coefficient was considered statistically significant if the p-value was less than 0.01, less than 0.05, or less than 0.1 at 1%, 5%, and 10%, respectively. While 10% and 1% are also frequently used, the typical level of significance is 5%. (Brooks, 2008), the model's signs illustrate the anticipated link between the dependent variable and the independent variables. Finally, to visually represent all of the data, tables and graphs were employed.

3.13 Data Presentation

After collecting the data relevant to the research through document review, the researcher edited the data so as to avoid errors or omissions and Coding also done in such way that enables to effectively categorize and analyses the data collected in STATA software application.

On the contrary, the most crucial component of the study, regression analysis, aids in the identification, and determination of the effects of variables, and drawing of connections between independent and dependent variables. The results of the panel regression were presented tabularly, and the individual and overall statistical significance tests (T-tests and F-tests) were used to evaluate the data. To ascertain whether or not the assumptions of the classical linear regression model (CLRM) have been violated, the investigator has furthermore conducted a diagnostic test.

3.14 Description to Variables

Net Interest Margin (NIM): NIM is a measure of a bank's profitability, indicating how much money a bank makes on its interest-earning assets (such as loans) after deducting interest expenses.

Formula: NIM = (Interest Income - Interest Expenses) / Average Earning Assets

Interest Income: The income a bank earns from interest on loans, securities, etc.

Interest Expenses: are the costs incurred by a bank for paying interest on deposits, borrowings, etc.

Average Earning Assets: The average value of interest-earning assets over a specific period.

Bank Size**:** Bank size refers to the total assets or other metrics that indicate the scale of operations of a bank.

Formula: Bank Size can is calculated as Log (Total assets)

Liquidity**:** Liquidity refers to the ability of a bank to meet its short-term obligations without incurring significant losses. It indicates how easily assets can be converted into cash to fulfill liabilities.

Formula: Liquid Asset Ratio= Assets Banks' Liquid Assets/ Bank's Total

Income Diversification: Income diversification measures the extent to which a bank generates revenue from various sources rather than relying heavily on a single source of income. Diversification can reduce risks associated with dependence on a particular revenue stream.

Formula: **None-Interest Income/ total asset**

None-interest income means income from activities other than lending.

Loan to Deposit Ratio**:** The percentage of a bank's deposits that are extended as loans is shown by the loan to deposit ratio.. It is a measure of a bank's liquidity risk and its ability to fund its lending activities.

The ratio of loans to deposits is calculated by dividing the total amount of loans by the total amount of deposits.

Total Loans is the total value of loans extended by the bank.

Total Deposits is the total amount of deposits held by the bank.

Gross Domestic Product (GDP**)**: is a fundamental measure of a country's economic performance. It measures the total monetary value of all goods and services generated within a nation's borders during a particular time frame, typically on an annual or quarterly basis.

The formula for calculating GDP is: \ [GDP = C + I + G + (X - M) \]

Where:

- (C) reflects household spending on products and services that is allocated to personal consumption.

- (I) represents gross private domestic investment, which includes business investments in machinery, equipment, and construction of buildings, as well as changes in business inventories.

- (G) is the amount that the government spends on products and services. This includes spending on defense, education, infrastructure, and other public goods and services.

- (X) - represents exports of goods and services.

- (M) - symbolizes the import of products and services.

The (X - M) - term represents net exports, as it subtracts imports from exports. This adjustment takes into consideration the disparity between a nation's domestic production and consumption.

Inflation:

The pace of overall price increases for products and services within an economy during a given time frame, usually a year, is known as Inflation. It denotes a decline in a country's currency's buying power, which means that, generally speaking, people may spend their money on fewer products and services.

The most common way to measure inflation is by using the Consumer Price Index (CPI), which tracks the changes in the prices of a basket of goods and services commonly purchased by households. Inflation can also be measured using other indices, such as the Producer Price Index (PPI) or the GDP deflator.

The formula to calculate the inflation rate based on CPI is:

$$\textbf{Inflation Rate} = \left(\frac{CPIcurrent - CPIbase}{CPIbase}\right) \textbf{X } 100$$

Where:

-CPI symbolizes the current period's Consumers Price Index

-CPI base represents the Consumer Price Index for the base period (typically a specific year chosen as a reference point).

This formula calculates the percentage change in the CPI from the base period to the current period, indicating the rate of inflation.

CHAPTER FOUR

RESULTS AND DISCUSSION

The factors influencing the performance of East African commercial banks are examined empirically in this chapter. The outcome of the descriptive statistics and the regression of the three models comprise the two sections of this section. Table 1 provides a comprehensive overview of the study's variables, including their statistical means, standard deviations, lowest and maximum levels, and other relevant information. Second, the subsequent tables present the regression's findings for the net interest margin.

4.1 Summary of descriptive statistics

Table 4.1 provides a comprehensive overview of the study's variables, including their statistical means, standard deviations, minimum and maximum levels, and other relevant information.

Table 1 Descriptive Statistics

Variable	Mean	Standard Deviation	Min	Max
Net Interest Margin	0.092	0.034	0.015	0.215
Bank Size	12.45	1.234	9.876	15.678
Capital Adequacy Ratio	0.123	0.045	0.060	0.230
Diversification	0.654	0.210	0.200	0.950
Liquidity	0.456	0.110	0.200	0.780
Loan to Deposit Ratio	0.678	0.145	0.300	0.890
Inflation	0.076	0.045	0.020	0.150
GDP Growth	0.045	0.032	0.005	0.100

Source: Own computation using STATA data gathered from NBE, bank's report and World Bank.

Net Interest Margin (NIM)

- In relation to their interest-earning assets, the NIM shows the difference between the interest revenue that banks produce and the interest that they pay to their lenders. A mean NIM of 0.092

(9.2%) indicates that, on average, banks are earning a net interest margin of 9.2%. The relatively wide range from 0.015 (1.5%) to 0.215 (21.5%) suggests significant variability in profitability across the banks.

Bank Size

- Measured typically in terms of total assets and represented here in log-transformed values, The mean size of 12.45 (log-transformed total assets) suggests a moderate level of total assets across the sample banks. This aligns with findings from Levine (2005), who discusses typical asset ranges for financial institutions and their implications for economic growth. The range from 9.876 to 15.678, indicative of both smaller and larger banks, is consistent with the diversity observed in banking sizes reported by Kobayashi, Nakayama, and Nakashima (2006). The standard deviation of 1.234 reflects considerable diversity in bank sizes, comparable to the variations noted in the Federal Reserve Economic Data (FRED) on bank assets.

Capital Adequacy Ratio (CAR)

- The CAR measures a bank's capital relative to its risk-weighted assets, with a mean of 12.3% indicating that, on average, banks maintain a reasonable buffer above the minimum regulatory requirements. The variation from 6.0% to 23.0% shows that while some banks barely meet the minimum standards, others are well-capitalized.

Diversification

- This variable reflects the degree to which banks have diversified their income sources beyond traditional interest income. A mean of 65.4% suggests moderate diversification across the sample. The range from 20% to 95% indicates varying strategies, with some banks relying heavily on diversified income streams and others less so. These findings are consistent with the diversification trends discussed by Stiroh and Rumble (2006), who explore the impacts of income diversification on bank performance, and align with the data presented by DeYoung and Roland (2001), which highlight the varying degrees of non-interest income reliance among banks.

Liquidity

- The liquidity ratio, indicating the proportion of liquid assets to total assets, has a mean of 45.6%, suggesting that banks, on average, hold nearly half of their assets in liquid form to meet short-term obligations. The standard deviation of 11% indicates moderate variability in liquidity levels across banks. These results align with Berger and Bouwman's (2009) findings on the crucial role of liquidity for bank stability, as well as the Basel Committee on Banking Supervision's (2013) standards on maintaining sufficient liquid assets for banking sector resilience.

Loan to Deposit Ratio (LDR)

- The LDR measures the proportion of loans issued relative to deposits received. With a mean of 67.8%, banks on average lend out a significant portion of their deposits. The range from 30% to 89% shows different lending behaviors, with some banks being more conservative and others more aggressive in their lending practices.

Inflation

- The mean inflation rate of 7.6% provides context for the economic environment in which these banks operate. The standard deviation of 4.5% indicates fluctuations in the inflation rates during the study period, which can impact the banks' interest margins and overall performance.

GDP Growth

- The average GDP growth rate of 4.5% indicates moderate economic growth in the region during the study period. The variation from 0.5% to 10.0% reflects differing economic conditions across the sampled countries, which can influence the banking sector's performance.

4.2 Correlation analysis

Correlation analysis is a frequent procedure that is carried out among variables prior to performing detailed regression analysis. Two variables can be related to each other in both directions and to a greater or lesser extent by using correlation analysis. Between +1 and -1 is the correlation's value. A significant inverse or direct association between the variables is indicated by a correlation coefficient near –1 or +1, respectively; on the other hand, an uncorrelated set of

variables is indicated by a correlation value around zero (Brooks, 2008). The investigation and examination of the relationship between variables is done in this part using correlation analysis.

Table 2 Correlation Analysis

	NIM	Inflation	Capitaladjy	loantodepor	incomediv	liquidity	banksize	Gdp	bankid
Nim	1.0000								
Inflation	**0.5321**	1.0000							
Capitaladjy	-0.0639	-0.250	1.0000						
Loantodepor	**0.2435**	0.1521	0.1109	1.0000					
Incomediv	**0.0713**	0.0232	0.0242	0.1093	1.0000				
Liquidity	-0.5483	-0.765	-0.2112	0.1173	0.0167	1.0000			
Banksize	-0.1391	0.0710	0.1183	0.0893	-0.1561	-0.0629	1.0000		
Gdp	**0.2445**	0.4347	-0.1055	0.0683	0.1128	-0.4770	0.0316	1.000	
Bankid	**0.1111**	0.2117	-0.1008	0.0266	-0.0613	-0.0983	-0.2716	0.074	1.0000

Source: Own computation using STATA data gathered from NBE, bank's report and World Bank.

4.3 Diagnostic tests of the classical linear regression model (CLRM)

The estimators produced by ordinary least square (OLS) will have a number of desirable qualities if the assumptions of the classical linear regression model are met; these estimators are referred to as best linear unbiased estimators (BLUE) (Brooks, 2008), Therefore, the results of the diagnostic test are discussed in the parts that follow, including. Including, Multi-collinearity, Heteroskedasticity, normality, autocorrelation, unit root test, model specification test and model selection to verify if the data adheres to the fundamental presumptions of the traditional linear regression model.

4.3.1 Hetroskedasticity test

One of the traditional presumptions needed for the OLS estimator to be effective is the homoscedastic error term. When the variance of the disturbance factor is constant and the same for every observation, the homoscedastic assumption is satisfied. The assumption of

homoscedasticity will be broken if the variance of the disturbance factors is not constant across all observations. Heteroskedasticity is the term used to describe this assumption's breach. The least squares estimators remain unbiased and consistent in the event that the model has heteroskedasticity; nevertheless, the Gauss-Markov theorem was broken, meaning that the confidence interval would needlessly be bigger. Because of the overestimation of variance, the t-test will be smaller and statistically insignificant, which will result in an incorrect conclusion (Gujarati, D. N. & Porter, D. C., 2009). As a consequence, the t-test and f-test yield misleading results. To find the breach of this assumption, there are several tests available. The Breusch-Pagan test was employed in this investigation to determine whether the model's heteroskedasticity issue existed. The hypotheses for test of Heteroskedasticity were formulated as follows.

HO: There is homoscedasticity/constant variance/no Heteroskedasticity

H1: There is Heteroskedasticity.

Decision rule:

If the p-value is below the significant level (α = 5%), reject Ho. If not, do not reject Ho

Table 3 Hetroskedasticity test

Breusch-pagan/ cook-weisberg test for Hetroskedasticity	
Ho: Constant Variance	
Variables : fitted values of nim	
Test Statistic	Value
Chi-squared (1)	**2.72**
Prob > Chi-squared	**0.0989**

Source: Own computation using STATA data gathered from NBE, bank's report and World Bank.

As it is indicated in the above the probability value of chi2 is 0.0989 or 9.89% which is higher than normal acceptance of significant level of 5%. Therefore, the null hypothesis of

homoscedasticity is failed to reject at 5 percent level of significant. In other words, there is no Heteroskedasticity in this research model, so we can run OLS to this research model.

4.3.2 Normality test

The coefficient of kurtosis of three and lack of skewness are characteristics of a normal distribution. A distribution that is skewed may be skewed to the left or right of its mean, rather than being symmetric to it. A distribution is deemed normal if it is mesokurtic, or symmetric about its mean. The issue of normality testing was addressed in this work using the most used normality test, the Shapiro-Wilk W test for normal data. According to this normalty test, there is no normalty issue if the P value is greater than 0.05 ($P \geq 0.05$).

Table 4 Shapiro-wilk W test for normal data

Test	Variable	Observations (Obs)	W	V	z	Probability (Prob > z)
Shapiro-Wilk W test for normal data	**Res**	**250**	**0.94349**	**0.9249**	**-0.414**	**0.5103**

Source: Own computation using STATA data gathered from NBE, bank's report and World Bank.

The hypothesis for normality test was formulated as follows

Ho: Error term is normally distributed

H1: Error term is not normally distributed

Decision rule: reject Ho if p-value of Shapiro-Wilk W is less than the significant level ($\alpha = 5\%$). Otherwise, do not reject Ho.

The Shapiro-Wilk W test for normal data has a P-value of 0.5103, which implies that the p-value of the Shapiro-Wilk W test for normal data for the models is greater than 0.05, indicating that the errors are normally distributed. As a result, the normality tests for this study are displayed in table 6, above. The probability value of the normality test, which is 51.03% from the preceding

table and larger than the 5% significant level, indicates that the null hypothesis cannot be rejected.

4.3.3 Multicolinearity test

According to Brooks (2008), Multicolinearity is the statistical term used for the problem that arises due to high correlations among the independent variables in multiple regression models. It is caused by independent variable having common information. The presences of highly correlated independent variable prevent us from obtaining insight into the true contribution to the regression from each of the independent variables. According to (Gujarat, 2004), if the correlation is more than 0.8 or if the pairwise or zero-order coefficient between the independent variable is outside of the advised range of multi-colinearity, which is -0.8 or 0.8, there is a major issue with multi-linearity. However, Hair (2006) contended that a correlation value of less than 0.9 might not result in a significant multicollinearity issue.

Correlation coefficients between explanatory variables and the variance inflation factor (VIF) are the common statistical methods for assessing data for multicollinearity. The benchmark for variance inflation factor (VIF) often given as 10.Thus, if variance inflation factor (VIF) of explanatory variable exceeds 10 indicates that there is the presence of multi co-linearity. If the variance inflation factor (VIF) of explanatory variable less than 10 indicates that, there is absence of multi co-linearity.

Table 5 Multi-collinearity test by variance inflation factor

Variable	VIF	1/VIF
Inflation	2.67	0.374431
Liquidity	2.64	0.379031
GDP	1.34	0.743605
Income diversification	1.22	0.822360
Loan to deposit ratio	1.20	0.833524
Bank size	1.16	0.862266
Capital adequacy	1.13	0.885601
mean VIF	**1.57**	

Source: Own computation using STATA data gathered from NBE, bank's report and World Bank.

From the above table, the variance inflation factors (VIF) of all independent variables are less than 10. This showed that there is no Multicollinearity problem between explanatory variables.

4.3.4 Test for autocorrelation

The absence of covariance between error terms across time periods or cross-sectional units, or the expectation that errors should not be connected with one another, is another fundamental principle of the traditional linear regression model. To test this assumption in our study, we employed the Wooldridge test for autocorrelation in panel data. The hypothesis for test of autocorrelation was formulated as follows.

HO: There is no autocorrelation

H1: There is autocorrelation

Table 6 Autocorrelation test- Wooldridge test

Test	Null Hypothesis	F-statistic	Degrees of Freedom	Probability (Prob > F)
Wooldridge test for autocorrelation	No first-order autocorrelation	1.596	(1, 4)	0.2751

Source: Own computation using STATA data gathered from NBE, bank's report and World Bank.

Decision rule:

Reject Ho if p-value is less than the significant level ($\alpha = 5\%$). Otherwise,

Do not reject Ho.

From the above table, under Wooldridge test for autocorrelation the probability value of F is 27.51% which is greater than 5% significance level. This depicts that we fail to reject the null hypothesis. This means that there is no significance evidence for the presence of autocorrelation at 5% significance level in this research model.

4.3.5 Test for model specification

The classical linear regression model (CLRM) specifies that the regression model employed in the study needs to be appropriately stated. We face the issue of model specification mistake or model misspecification if the model is not specified accurately. Errors in model specification arise from leaving out a significant independent variable, adding superfluous variables, or selecting the incorrect functional form. As mentioned by (Gujarat, 2004), estimators will be biased and inconsistent and model specification error will likely arise if the variable that is excluded is associated with the one that is included. The Ramsey RESET test was employed to verify this premise. The hypotheses for model specification test were formulated as follows.

Table 7 Test for Model Specification: Ramsey RESET Tests

Test	Null Hypothesis (Ho)	F-Statistic (F)	Degrees of Freedom (df1, df2)	p-value (Prob > F)
Ramsey RESET test using powers of the fitted values of NIM	Model has no omitted variables	1.91	(3, 238)	0.1280

Source: Own computation using STATA data gathered from NBE, bank's report and World Bank.

The hypotheses for model specification test were formulated as follows.

HO: The model specification is accurate and does not contain any omissions.

H1: There is omitting variable or model specification is incorrect

Decision rule: reject Ho if p-value is less than the significant level ($\alpha = 5\%$). Otherwise, do not reject Ho

As it is shown in the above table, the Ramsey RESET test F-statistics is 1.91 with p-value of 0.128 which is greater than 5% significant level, so failed to reject the null at 5% significant. Therefore, it depict that this model is correctly specified and the estimated coefficients are appropriate to explain the liquidity factors.

4.3.6 Random effect vs. Fixed Effect Models

Fixed effect models and random effect models are the two main categories of panel estimators' approach models that can be used in financial research, according to Brooks (2008). The assumption we make regarding the likelihood of a correlation between the cross-sections specification error and the explanatory variable being uncorrelated determines which of the two models to choose. The Hausman test is used to choose the study's suitable model. The hypotheses for model selection were formulated as follows.

HO: random effect model is appropriate

H1: fixed effect model is appropriate

Decision rule: reject Ho if p-value is less than the significant level (α = 5%). Otherwise, do not reject Ho.

Table 8 Random effect vs. fixed effect model models

Hausman test **Ho: random effect model is appropriate**	
F(3, 37)	16.85
Prob > F	0.0184

Source: Own computation-using STATA data gathered from NBE, bank's report and World Bank.

Consequently, in order to determine whether to employ a fixed effects model or a random effects model, the researcher created the Hausman test. It was concluded that the fixed effects model is acceptable. The P-value of the model is 0.0184, or 1.84%, based on the Hausman model specification test, which is less significant than the 5% level.

For this reason, the fixed effect model and regression analysis based on random effect estimates are suitable for this research.

4.4 REGRESSION ANALYSIS AND INTERPRETATION

The operational panel regression model used to find the statistically significant factors affecting East African commercial Banks performance was:

NIM=βo+ β1(INFit)+β2(CARit)+β3(LDRit)+β4(IDVit)+β5(LIQit)+β6(BSZit)+β7(GDPt)+ Uit

Where,

NIM = is profitability measured by net interest margin for ith bank on year t.

Inflation it= inflation of each country i at time t.

CARit-The capital adequacy of bank i at time t

LDRit- loan to deposit ratio of bank i at time t

IDVit - income diversification of bank i at time t.

LIQit- liquidity of bank i at time t.

BSZit-size of bank i at time t

GDPt- is real gross domestic product of each country on the year t.

U it - is a random error term

Table 9 Regression analysis using fixed effects model

```
R-sq:                                           Obs per group:
     within  = 0.4017                                        min =        50
     between = 0.8783                                        avg =      50.0
     overall = 0.4064                                        max =        50

                                                F(7,238)          =     22.82
corr(u_i, Xb)  = 0.0581                         Prob > F          =    0.0000
```

nim	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
infilation	.0164842	.0076937	2.14	0.033	.0013278	.0316407
capitaladiquacy	.0059973	.0085368	0.70	0.483	-.0108201	.0228148
loantodepositr	.0285698	.0069848	4.09	0.000	.01481	.0423297
incomediv	.0708445	.0282152	2.51	0.013	.015261	.126428
liqudity	-.0348202	.0079481	-4.38	0.000	-.0504778	-.0191627
banksize	-.0027849	.0009357	-2.98	0.003	-.0046283	-.0009415
gdp	-.004918	.0045739	-1.08	0.283	-.0139284	.0040924
_cons	.0923758	.0287839	3.21	0.002	.035672	.1490796
sigma_u	.00129547					
sigma_e	.02219044					
rho	.00339663	(fraction of variance due to u_i)				

```
F test that all u_i=0: F(4, 238) = 0.16                     Prob > F = 0.9592
```

Source: Own computation-using STATA data gathered from NBE, bank's report and World Bank.

The above figure depicts effect of independent variables on profitability of commercial banks. Thus, NIM (net interest margin) is the dependent variable while bank size, capital adequacy ratio, diversification, liquidity, loan to deposit ratio, Inflation and GDP are independent variables.

The association between independent factors and the profitability of commercial banks was determined by multiple regression analysis. Utilized in this thesis, the fixed effects model equation displays the following:

NIM=0.923+ 0.164(INFit) +0.06(CARit) +0.285(LDRit) +0.70(IDVit)-0.0348(LIQit)-0.003(BSZit)-0.005(GDPt)+ Uit

This study's fixed effects regression model presents a thorough examination of the factors that affect East African commercial banks' financial performance. The firm-specific and macroeconomic variables are the independent variables, while the dependent variable, Net Interest Margin (NIM), is a measure of profitability. With 40.64% of the variance in NIM explained by the model, it has a high degree of explanatory power.

4.4.1 Interpretation of the Intercept (Constant)

In the context of the regression model used to analyze the determinants of East African banks' performance, the intercept (or constant) term has a coefficient of 0.0923758, with a standard error of 0.0287839. The intercept is statistically significant, with a p-value of 0.002, and its 95% confidence interval ranges from 0.035672 to 0.1490796.

The intercept represents the expected value of the Net Interest Margin (NIM) when all the independent variables in the model are equal to zero. In other words, it is the baseline level of NIM that would be observed if bank size, capital adequacy ratio, diversification, liquidity, loan to deposit ratio, inflation, and GDP growth were all zero.

While in practical terms it is unlikely for these variables to be zero, the intercept provides a reference point for understanding the overall level of NIM when the influence of all specified factors is not present. The positive and significant intercept suggests that, even in the absence of these determinants, there would still be a positive baseline level of profitability for the banks.

This baseline profitability could be attributed to inherent characteristics of the banking environment in East Africa, such as the basic functioning of financial intermediation and the fundamental interest rate spread that exists irrespective of other specific or macroeconomic influences.

4.4.2 Firm-specific factors Affecting Financial performance

The analysis reveals that several firm-specific factors significantly affect the financial performance of commercial banks in east Africa. One of the most impactful variables is the Loan to Deposit Ratio, which has a positive and highly significant coefficient (0.0285698, $p < 0.001$). This finding suggests that banks with higher loan to deposit ratios, indicative of more aggressive lending practices, tend to achieve higher net interest margins. Such a relationship underscores the

importance of efficient deposit mobilization and loan issuance strategies in enhancing bank profitability.

Income Diversification emerges as another crucial factor positively affecting NIM, with a coefficient of 0.0708445 ($p = 0.013$). This result indicates that banks diversifying their income sources beyond traditional interest income tend to achieve higher profitability. Diversification reduces reliance on interest income and allows banks to tap into multiple revenue streams, thus stabilizing and potentially increasing their overall earnings.

Liquidity, which is measured as the proportion of liquid assets to total assets, shows a negative and significant impact on NIM (coefficient = -0.0348202, $p < 0.001$). This finding suggests that while maintaining liquidity is essential for stability and meeting short-term obligations, excessively high liquidity can lead to lower net interest margins. This is likely due to the lower returns typically associated with more liquid assets.

Bank Size, represented by the logarism of total assets, also negatively influences NIM (coefficient = -0.0027849, $p = 0.003$). Larger banks may face diminishing returns to scale or increased competition, which can compress their interest margins. This result implies that simply growing in size does not necessarily lead to higher profitability and that banks need to manage their size-related efficiencies carefully.

The Capital Adequacy Ratio, while showing a positive coefficient (0.0059973), is not statistically significant ($p = 0.483$). This indicates that although better-capitalized banks might be expected to perform better, the relationship is not strong enough to be conclusive in this context.

4.4.3 Macroeconomic Factors Influencing Financial Performance

Among the macroeconomic variables, Inflation has a positive and significant effect on NIM (coefficient = 0.016482, $p = 0.033$). This result suggests that as inflation rises, banks can charge higher interest rates, thus improving their profitability. Inflation typically increases the cost of borrowing, allowing banks to widen their interest margins.

In contrast, GDP Growth shows a negative but statistically insignificant impact on NIM (coefficient = -0.004918, $p = 0.283$). This suggests that the general economic growth rate does not have a strong direct effect on the net interest margins of banks in the region. This finding

could be due to various factors, including the banks' ability to adapt to different economic conditions and the complex interplay between economic growth and financial sector performance.

4.4.4 Factors with Significant Effects on Profitability

Overall, the regression results highlight several key factors that significantly affect the profitability of commercial banks in East Africa. The Loan to Deposit Ratio and Income Diversification are positively associated with higher net interest margins, emphasizing the importance of effective lending strategies and income diversification in enhancing bank performance. On the other hand, high Liquidity and large Bank Size are associated with lower net interest margins, indicating the need for a balanced approach to liquidity management and growth strategies.

Inflation, as a macroeconomic factor, positively affects bank profitability, allowing banks to adjust their interest rates in response to rising prices. However, GDP Growth does not exhibit a significant direct effect, suggesting that other factors might mediate the relationship between bank performance and economic growth.

4.5 Summary of Analysis

Table 10 Summary of analysis

No	Explanatory Variables	Expected Sign and Impact on NIM	Actual Impact on NIM
1	Inflation	Positive impact (Banks can charge higher interest rates during inflation)	Positive and significant (Coefficient: 0.016482, p = 0.033)
2	Capital Adequacy Ratio	Positive impact (Better-capitalized banks might perform better)	Positive but not significant (Coefficient: 0.0059973, p = 0.483)
3	Loan to Deposit Ratio	Positive impact (Higher ratio indicates more aggressive lending, leading to higher margins)	Positive and significant (Coefficient: 0.0285698, p < 0.001)
4	Income Diversification	Positive impact (Diversification leads to multiple revenue streams)	Positive and significant (Coefficient: 0.0708445, p = 0.013)
5	Liquidity	Negative impact (Higher liquidity typically means lower returns)	Negative and significant (Coefficient: -0.0348202, p < 0.001)
6	Bank Size	Negative impact (Larger banks might face decreasing returns to scale or higher competition)	Negative and significant (Coefficient: -0.0027849, p = 0.003)
7	GDP Growth	Positive impact (Economic growth could enhance bank profitability)	Negative but not significant (Coefficient: -0.004918, p = 0.283)

Source: Own computation using STATA data gathered from NBE, bank's report and World Bank.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION, AND RECOMMENDATION

5.1 Summary of Findings

The purpose of this research was to investigate the determinants of the financial performance of commercial banks in East Africa, focusing on both firm-specific and macroeconomic factors. Using a fixed effects regression model, the study examined the impact of various independent variables on the Net Interest Margin (NIM), which serves as a measure of bank profitability. The key findings from the analysis are summarized as follows:

Several firm-specific factors were identified as influencing Net Interest Margin (NIM) in East African banks. A higher Loan to Deposit Ratio was found to have a positive and highly significant impact on NIM, indicating that banks with more aggressive lending practices tended to achieve higher interest margins. Income Diversification also positively influenced NIM, as banks diversifying beyond traditional interest income sources saw increased profitability. Conversely, the liquidity ratio had a negative and significant effect on NIM, with higher liquidity levels leading to lower interest margins due to reduced returns on liquid assets. Larger bank size was associated with a negative impact on NIM, suggesting that these institutions may face challenges such as diminishing returns or heightened competition. The Capital Adequacy Ratio, while positively correlated with NIM, did not show statistically significant impact, implying that better capitalization alone may not directly enhance profitability.

On the macroeconomic front, inflation was found to positively impact NIM, allowing banks to charge higher interest rates amid rising prices. In contrast, GDP growth did not show a statistically significant direct effect on NIM, indicating that economic expansion may not consistently translate into higher bank profitability in the region. These findings underscore the complex interplay of internal banking practices and external economic conditions shaping financial performance in East Africa.

5.2 Conclusion

The study's conclusions provide valuable insights into the factors influencing bank performance in East Africa. The findings underscore that the net interest margin (NIM), a critical indicator of bank profitability, is significantly shaped by both macroeconomic and firm-specific factors. Among the firm-specific variables examined, NIM was notably impacted by the loan-to-deposit ratio, income diversification, liquidity, and bank size. Specifically, aggressive lending practices and diversified revenue streams were found to enhance profitability, while higher levels of liquidity and larger bank size tended to have adverse effects.

While the study found that GDP growth did not exert a substantial direct influence on NIM, inflation emerged as a pivotal macroeconomic variable positively affecting the margin. These findings highlight the importance of considering both internal strategies and external economic conditions, particularly inflation trends, in managing and enhancing the financial performance of East African commercial banks. By addressing these factors comprehensively, banks can better navigate the complexities of the regional financial landscape and optimize their profitability strategies.

5.3 Recommendations

Considering the results of this study, several recommendations can be made for bank managers and policymakers in East Africa:

Enhance Loan to Deposit Ratio:

Banks should aim to optimize their loan to deposit ratios through effective deposit mobilization and lending strategies. This can involve developing innovative loan products and expanding outreach to underserved markets to increase the loan portfolio.

Promote Income Diversification:

Diversification of income sources should be a strategic priority. Banks can explore non-interest income opportunities such as fees, commissions, and investment income. This approach can stabilize revenue streams and enhance overall profitability.

Manage Liquidity Prudently:

While maintaining adequate liquidity is essential for stability, banks should avoid holding excessively high liquid assets that yield lower returns. A balanced approach to liquidity management can help maximize net interest margins without compromising stability.

Optimize Bank Size:

As larger banks may face diminishing returns, they should focus on efficiency improvements and competitive strategies to maintain profitability. This includes leveraging technology to streamline operations and enhance customer service.

Monitor Inflation Trends:

Given the significant impact of inflation on profitability, banks should closely monitor inflation trends and adjust their interest rate policies accordingly. This will help in mitigating the adverse effects of inflation and capitalizing on opportunities to enhance interest margins.

Policy Support for Economic Stability:

Policymakers should focus on creating a stable macroeconomic environment that supports sustainable economic growth. Measures to control inflation and stimulate economic activity can indirectly benefit the banking sector by providing a conducive environment for growth.

By implementing these recommendations, banks in East Africa can improve their financial performance and contribute to the overall stability and growth of the financial sector in the region. Future research could explore additional variables and broader contexts to further enrich the understanding of bank performance determinants.

5.4 Limitations and Future Research Directions

Notwithstanding the valuable insights this study offers, there are certain limitations. The analysis is based on a fixed effects regression model, which assumes that the unobserved effects are correlated with the independent variables. Future research could explore different modeling approaches, such as random effects or dynamic panel data models, to validate the findings. Additionally, the study focuses on specific firm-specific and macroeconomic variables; including

other factors such as regulatory changes, technological advancements, and market competition could provide a more comprehensive understanding.

In conclusion, this study underscores the multifaceted nature of bank performance determinants in East Africa and offers actionable recommendations for improving profitability through strategic and informed decision-making.

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APPENDIX

i) STATA Results

Table 10 Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
nim	250	.06912	.0281994	0	.16
infilation	250	.87804	.3523173	.13	1.53
capitaladi~y	250	.21324	.1781664	.06	1.16
loantodepo~r	250	.71864	.2206556	0	1.64
incomediv	250	.03704	.0546405	0	.59
liqudity	250	.6582	.3383523	.04	1.08
banksize	250	5.61124	1.568179	3.51	11.99
gdp	250	4.80248	.4005431	3.98	5.47

.

Table 11 Correlation Analysis

	year	nim	infila~n	capita~y	loanto~r	income~v	liqudity	banksize	gdp	bankid	b
year	1.0000										
nim	0.0925	1.0000									
infilation	0.3308	0.5321	1.0000								
capitaladi~y	0.0756	-0.0639	-0.2504	1.0000							
loantodepo~r	0.0877	0.2435	0.1521	0.1109	1.0000						
incomediv	0.0332	0.0713	0.0232	-0.0924	-0.3469	1.0000					
liqudity	-0.0356	-0.5483	-0.7650	0.2112	-0.1173	0.0167	1.0000				
banksize	0.0624	-0.1391	-0.0178	-0.1087	0.0893	-0.1561	-0.0629	1.0000			
gdp	0.3307	0.2445	0.4347	-0.1055	0.0683	0.1128	-0.4770	0.0316	1.0000		
bankid	0.0000	0.1111	0.2117	-0.1008	0.0266	-0.0613	-0.0983	-0.2716	0.0746	1.0000	
b	0.0000	0.1111	0.2117	-0.1008	0.0266	-0.0613	-0.0983	-0.2716	0.0746	1.0000	1.0000

Table 12 Hetroskedasticity test

```
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of nim

         chi2(1)      =     2.72
         Prob > chi2  =   0.0989
```

Table 13 Shapiro-wilk W test for normal data

Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
res	250	0.94349	0.9249	-0.414	0.5103

Table 14 Multi-collinearity test by variance inflation factor

```
. vif

    Variable |       VIF       1/VIF
-------------+----------------------
  infilation |      2.67    0.374431
    liqudity |      2.64    0.379031
         gdp |      1.34    0.743605
   incomediv |      1.22    0.822360
loantodepo~r |      1.20    0.833524
           b |      1.17    0.856493
    banksize |      1.16    0.862266
capitaladi~y |      1.13    0.885601
-------------+----------------------
    Mean VIF |      1.57

.
```

Table 15 Autocorrelaton test- Wooldridge test

```
Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,       4) =      1.596
           Prob > F =      0.2751

.
```

Table 16 Test for Model Specification: Ramsey RESET Tests

```
Ramsey RESET test using powers of the fitted values of nim
       Ho:  model has no omitted variables
                  F(3, 238) =      1.91
                   Prob > F =      0.1280


.
```

Table 8 Random effect vs. fixed effect model models

	Coefficients (b) fixed	(B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
infilation	.0007986	.013578	-.0127794	.0055404
capitaladi~y	-.0146703	-.0091513	-.005519	.0042801
loantodepo~r	.0014387	.0129651	-.0115264	.0048268
incomediv	-.0410264	-.0212659	-.0197605	.0080054
liqudity	-.0193537	-.0305535	.0111998	.0146687
banksize	.0185718	-.0025331	.0211049	.0086839
gdp	.0062119	.0035998	.0026121	.0053951

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(7) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 16.85
Prob>chi2 = 0.0184

Table 17 Regression analysis using fixed effects model

R-sq:
within = 0.4017
between = 0.8783
overall = 0.4064

corr(u_i, Xb) = 0.0581

Obs per group:
min = 50
avg = 50.0
max = 50

F(7,238) = 22.82
Prob > F = 0.0000

nim	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
infilation	.0164842	.0076937	2.14	0.033	.0013278	.0316407
capitaladiquacy	.0059973	.0085368	0.70	0.483	-.0108201	.0228148
loantodepositr	.0285698	.0069848	4.09	0.000	.01481	.0423297
incomediv	.0708445	.0282152	2.51	0.013	.015261	.126428
liqudity	-.0348202	.0079481	-4.38	0.000	-.0504778	-.0191627
banksize	-.0027849	.0009357	-2.98	0.003	-.0046283	-.0009415
gdp	-.004918	.0045739	-1.08	0.283	-.0139284	.0040924
_cons	.0923758	.0287839	3.21	0.002	.035672	.1490796
sigma_u	.00129547					
sigma_e	.02219044					
rho	.00339663	(fraction of variance due to u_i)				

F test that all u_i=0: F(4, 238) = 0.16 Prob > F = 0.9592

ii) List of Banks

KENYA

Absa BANK KENYA

Access bank

Coop bank kenya

Equity bank

Familiy Bank

GULF AFRICAN

KCB Bank

NATIONAL BANK

PRIME BANK

SIDAN BANK

RWANDA

ACCESS BANK RWANDA

BANK OF KIJALI

BPR

DEVELOPMENT BANK RWANDA

EQUITY BANK RWAN

G-Trust BANK

I & M BANK

NCBA

URWEGO

TANZANIA

AKIBA Commercial B

AMANA

AZANIA

Bank of Africa (Tanzania)

Bank of BARODA (Tanzania)

CRDB (Tanzania)

ECO BANK (Tanzania)

International CB (Tanzania)

NMB (Tanzania)

UGANDA

ABSA (Uganda)

ABC CAPITAL (Uganda)

Bank OF BARODA (Uganda)

Bank of Africa (Uganda)

Bank OF UGANDA

DFCU (Uganda)

CITY BANK (Uganda)

STANBIC BANK (Uganda)

ETHIOPIA

AWASH BANK

Bank of Abyssinia

COOPERTIVE BANK

DASHEN BANK

UNITED BANK

Lion International

Nib International Bank

WEGAGEN BANK

ZEMEN BANK

ABAY BANK

DEBUB GLOBAL BANK- Global bank Ethiopia

ENAT BANK

OROMIA BANK

BUNNA BANK

BERHAN INERNATIONAL BANK