ADDIS ABEBA UNIVERSITY

COLLEAGE OF BUSINESS AND ECONOMICS

SCHOOL OF COMMERCE

FACTORS AFFECTING CAPITAL ADEQUACY OF COMMERCIAL BANKS: THE CASE OF PRIVATE COMMERCIAL BANKS IN ETHIOPIA

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A THESIS SUBMITTED IN THE PARTIAL FULFILLMENT OF THE REQUAIRMENT FOR THEDEGREE OF MASTERS OF CORPORATE FINANCE SPECIALITY INVESTMENT MANAGEMENT

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Statement of Declaration

I declare that this thesis is my work and all sources of materials used for this research have been fully acknowledged. This thesis has been submitted in partial fulfillment of the requirement for the degree of master's science (MSC) in Corporate Finance specialty investment Management.

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As thesis advisor, I have given my approval for this master's research to be submitted for review.

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This is to certify that the thesis prepared by Belayneh Zeleke, entitled: “Factors Affecting Capital Adequacy of Commercial Banks” the case of private commercial banks in Ethiopia and submitted in partial fulfillment of the requirements for MSC in Corporate Finance specialty investment Management with the regulations of the university and meets the accepted standards with respect to originality and quality.

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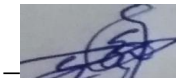
Signature _ 

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Table of Contents

List of abbreviation

NBE	National Bank of Ethiopia
CB	Commercial Banks
CAD	Capital Adequacy
GDP	Growth Domestic Product
IRF	Inflation Rate
EXR	Exchange rate
NPL	Non Performing Loan
LIQ	Liquidity Risk
AS	Asset Size
ROE	Return on Equity
MGEF	Management Efficiency

List of Table

List of Figures

Abstract

The purpose of the study was to identify the significant factors that determine capital adequacy of Ethiopian commercial banks from 2013 to 2024 using multiple linear regression analysis and correlation coefficient. The target population of all private commercial banks operating in Ethiopia which were established and registered between 2013 and 2024. Data was collected from sixteen private commercial banks from Secondary data. The study revealed a statistically significant positive relationship between the level of capital adequacy of commercial banks and independent variables - bank size and management efficiency. This means that the level of capital adequacy of

commercial banks had a statistically significant negative relationship with the variables namely - GDP, exchange rate, nonperforming loans, and return on equity which were not mentioned here, specifically outside the abovementioned mentioned variables. The capital adequacy of commercial banks in Ethiopia has a negative relationship with inflation, but is not statistically significant. The size of a bank and Management Efficiency had a positive and statistically significant relationship with commercial banks in Ethiopia. There was a statistically insignificant positive relationship between liquidity of commercial banks and capital adequacy. The results of the study showed that the independent variables explained some variance, but more importantly the difference that changed the dependent variable, as demonstrated by the ratio of dependent variables with independent variables were expressed to be roughly 70.1% cap. The study recommended NBE should implement Basel III for the purpose of classifying the minimum capital adequacy ratio as having a capital Tier component.

Keywords: Capital Adequacy, GDP, Inflation, Exchange rate, bank size, Non-Performing Loan, Return on Equity, Liquidity and Management Efficiency.

CHAPTER ONE

1. INTRODUCTION

Chapter one starts with a review of the background of the study to put into perspective the problems that relate to the factors affecting the capital adequacy of commercial banks in Ethiopia. After giving some background to the problem statement, which focuses on the direction of the study, it provides information about why this study was being conducted; it also includes a hypothesis for research regarding the relevant determinants. It also describes the general and specific objectives of the study. Finally, the structure of the paper along with the significance of the research, the scope of the study, and the limitations of the study are presented.

1.1. Background of the study

Ethiopia's banking industry has evolved significantly over the past twenty years. The 1994 Banking Proclamation established the national bank's responsibilities, creating an independent judicial body outside of the government. The establishment of the legislative framework for investments in the banking sector came about through Monetary and Banking Proclamation No. 83/1994 and Licencing Supervision of Banking Business No. 84/1994. After the pronouncement, there were 486 shareholders who started Awash International Bank, the first private bank in 1994. By 1998 the bank's capital rose to birr 50 million. The Dashen Bank was founded as a share company in share capital of birr 50.0 million approved and subscribed on September 20, 1995. Bank of Abyssinia established with 131 shareholders, birr 25.0 million and birr 50 million capital. Wegagen Bank started operation in 1997 with birr 60.0 million in authorized capital. United Bank, the fifth private bank, was founded by 335 shareholders on September 10, 1998. Nib International Bank opened for business on March 5, 1999. Ethiopia now has 32 commercial banks including conventional and Islamic.

Ethiopia's financial sector has benefitted from the presence of commercial banks that provide essential services to consumers, businesses, and government entities. As intermediaries, these banks facilitate the transfer of funds from savers to borrowers. Banks also provide clients and stakeholders a smoother transfer of funds Kharabsheh&Gharaibeh, (2022). Banks provide vehicles for financial services, encouraging payments and savings while managing risk. According to Andersen and Juelsrud (2022), bank services are necessary for substantive economic growth. Banking liquidity risk, which refers to the inability of a bank to have enough

liquidity to finance its liabilities, is a major concern for banks. A liquidity crisis could occur from sudden shifts in the financial system and, because banks use short-term funding for long-term assets, a liquidity crisis can result. This can result in a bank's failure to meet the demands of depositors requesting withdrawals or repay its liabilities, which can create a domino effect of instability.

Stability and resilience are essential aspects of Ethiopia's financial system. The National Bank of Ethiopia (NBE) has successfully maintained stability in the financial system, even during times of economic distress. To achieve stability and safeguard the banking sector, the NBE conducts many regulatory measures such as stress tests, liquidity management requirements, and capital adequacy regulations (No. SBB/78/2021). The financial sector, especially the banking sector in Ethiopia, has undergone significant changes lately due to fierce competition, and new technology and has also been affected by economic and political uncertainty.

Despite those challenges, the banking industry in Ethiopia has survived and has continued to grow. Ethiopian banks have paid a lot of attention to technology developments to meet the new demands of their consumers and identify new services and products. Since capital adequacy is the most essential element of banks' stability and solidity, it has been a major concern to both the regulators and banks themselves. Therefore, while regulatory authorities have tried to develop various measures of adequacy, the most significant of these is capital adequacy measure suggested by the Basell committee in 1983. The capital that a Financial institution has relative to its loans and other assets is called capital adequacy Barsel II, (1988).Wen (2010) thinks that for stability and cohesion of banks, capital is the most essential element. The financial community and stakeholders appear to be ignorant of the true determinants of capital adequacy and why some banks perform better than others Ongore (2012). Bank capital performs an important functions beyond allowing for the bank's daily functions. Certainly, bank capital is a buffer for bank loss; therefore when capital is higher in a bank, then the loss to its shareholders in case of a bank failure will be higher. So, shareholder owners of banks with high capitalization will be more risk-averse than the owners of banks with low capitalization.

Nevertheless, Elbannan (2017) asserts that while banks are only concerned with profit maximization, regulators are more concerned with putting in place the best possible set of laws and regulations, so they can fulfill their mandate of protecting stability and uniformity in the financial markets

Enhancing capital adequacy standards is an important goal for banking regulators. These standards are necessary for strengthening banks' operating reliability and sustainability. The

CAMEL framework used to explore capital, asset quality, management, earnings, and liquidity, as well as the PEARLS method that focuses on protection, effective financial structure, asset quality, rate of return, cost, liquidity, and signs of growth have contributed to establishing safety operations and ensuring bank capital adequacies, Thoa and Anh (2017)

Capital adequacy is characterized as the amount of capital a bank has to shield it from losses over and above what can normally be expected. For banks, having adequate capital creates advantages. First, having adequate capital for a bank helps support lending expansion, and development of new business. Second, adequate capital builds confidence with investors and depositor. They are seen as a stable financial investment. More confidence results in additional deposits and investments moreover it may improve the bank's financial position (profits).

Third, sufficient capital maintains a cushion to absorb an unexpected and unanticipated loss thus improving the chances of avoiding bankruptcy or insolvency. Finally, banks are required to meet and maintain (or be capitalized) capital adequacy requirements by regulatory authorities. Not meeting or maintaining capital adequacy requirements can provoke fining and penalties. Meeting capital adequacy requirements is an important issue for regulators primarily, because they want to make sure banks are small enough to safely moderate risky business, Morrison and White, (2001).

Numerous studies have been carried out by earlier researchers in the nation. These studies, however, only examine the use of standard ratios to gauge the banking industry's performance. The primary determinants of private commercial banks' capital adequacy have not been investigated in any research.Thus, this study has primarily focused on providing information about how the private commercial banks' capital adequacy ultimately determines and how well they can handle shocks to their balance sheets, taking into account all relevant factors. Additionally, by examining annual data from 2013 to 2024, the study determined the key factors that contribute to the banking sector's capital adequacy violations.

1.2. Statement of the Problem

A macroeconomic system will be considered stable when national saving is sufficient to limit excessive dependence on the borrowing of external resources. Macro policy tools must be compatible and proper, with regard for the exchange rate regime, to provide financial stability. This is an effort to prevent bank capital from being eroded by inflation, Adegbite and Ojo, J. A. (2010).

Capital Adequacy is integral to banking and the financial industry as a whole; it reduces the likelihood of bank failures, keeps financial institutions solvent, and maintains financial stability of the economy. The capital adequacy of the bank informs a bank's ability to meet its obligations and absorb potential losses in the context of capital adequacy, and it has a number of effects on the bank's stability and health Tamplin, (2023). Capital adequacy in commercial banking is an issue of current interest and has gained significant attention in the finance literature. Capital adequacy is the bank's view on its risk exposures, such as credit risk, market risk, interest rate risk or exchange rate risk which are all factors in the calculation of CAR Al-Sabbagh, (2004). The CAR was informative in provide regulators an index upon which to consider, a risk based index of safety or soundness of commercial banks Abdel-Karim, (1996).

Based on the working of the framework of financial stability, regulation and supervision are proactive, when macroeconomic conditions are conducive, and when financial institutions are stable. But the approach to supervision has to be remedial when institutions are close to stability yet have frequent tendences of falling into instability.

Through directive No. SBB/78/2021, subarticle 5.5, by which a minimum capital criterion for licensing and regulating the banking activities in Ethiopia was established, the NBE has also fixed the CAR on banks. The NBE set a minimum ratio to risk-weighted assets of 8% in this regulation. Capital adequacy defines the financial strength of the general economy and banking system. Stability of capital flow in the financial system depends, first in line, on individual institutions exercising their role.

Research work on the commercial banks' capital adequacy in the countries so far is extensive and covers numerous topics. Nevertheless, there is no much empirical work on external and bank-specific determinants of capital adequacy, especially in Ethiopia.

Therefore, the primary objective of this study is to provide evidence on how the commercial banks' capital adequacy and other factors finally influence their ability to cope with shocks to

their balance sheets. Furthermore, through the utilization of annual data covering the period between 2013 and 2024, the study was supposed to determine the most significant reasons why the banking sector's capital adequacy violations occur. Three macro-economic variables and five bank-specific variables real domestic product (GDP), inflation rate (IR), exchange rate (EXR), non-performing loans (NPL), liquidity (LQ), bank size (BS), return on equity (ROE), and management efficiency (ME) are considered to be explanatory variables. Hence, it is anticipated that this research was answer the following queries.

1. What are the bank-particular variables that determine the capital adequacy for commercial banks in Ethiopia?
2. What are the external variables that impact the capital adequacy for commercial banks in Ethiopia?

1.3. Objective of the Study

1.3.1. General Objectives

Investigating the determinants that impact Ethiopian commercial banks' capital adequacy is the main goal of this study. Real domestic product, exchange rate, inflation rate, asset size, non-performing loans, liquidity risk, return on equity, and management efficiency are the eight internal and external elements that are taken into account in this study.

1.3.2. Specific objective

Alongside the aforementioned primary objectives, the study was also having the following specific objectives.

1. To measure the extent to which bank specific factors (non performing loan, liquidity risk, Asset size, return on equity and management efficiency) and other than bank specific (inflation, exchange rate, growth domestic product) affect capital adequacy of commercial banks in Ethiopia
2. To investigate the relationship between the aforementioned variables determining capital adequacy and the impact of those factors on capital adequacy of the commercial banks.

1.4. Research hypothesis

According to Kothari (2004), a hypothesis is typically just an assumption or speculation that has to be proven or rejected.The following eight hypotheses have been developed based on a number of empirical studies and theoretical reviews.

H1: The GDP has a positive and substantial effect on the capital adequacy of commercial banks.

H2: The exchange rate has a negative and considerable effect on the capital adequacy of commercial banks.

H3: The rate of inflation has a negative and substantial effect on the capital adequacy of commercial banks.

H4: Bank size has a positive and considerable effect on the capital adequacy of commercial banks.

H5: Non-performing loans have a negativeand substantial effect on commercial banks' capital adequacy.

H6: ROE has apositivizeand considerable effect on the capital adequacy of commercial banks.

H7: Liquidity has a positive and significant effect on the capital adequacy of commercial banks.

H8;The capital adequacy of commercial banks is positively and significantly impacted by management efficiency.

1.5. Scope of the study

The focus of this study was to determine the factors that influence Ethiopian private commercial banks' capital adequacy. Ethiopia now has one Governmental owned and thirty private commercial banks. As of June 30, 2024, sixteen privately held commercial banks that have been operating in the country for at least twelve years are included in this study. The study was restricted by the researcher to private commercial banks in Ethiopia that were registered with the NBE prior to 20013, including Awash Bank, Abyssinia Bank, Dashen Bank, Wegagen Bank, United Bank, Nib International Bank, Cooprative Bank, Oromiya Bank, Addis International Bank, Enat Bank, Lion International Bank, Abay Bank, Buna International Bank, Global Bank of Ethiopia, Berhan Bank, and Zemen Bank. These banks were chosen because they are senior banks and are thought to have greater economic activity experience. The GDP, inflation rate, exchange rate, bank size, return on equity, nonperforming loan, liquidity rate, and management efficiency are also taken into account in this study while making decisions and analyzing data. In light of this, the study examines a panel of these banks' data over the period 20013 to 2024.

1.6. Significant of the study

Capital adequacy management is currently receiving significant attention in the banking sector of Ethiopia. The banks are also obliged to have their own capital adequacy policy to perform their

functions, absorb losses, and safeguard investors, as necessitated by the supervisory authority. As a result, this study contributes significantly to Ethiopian private commercial banks in determining their capital adequacy requirements, developing their capital adequacy policies, and giving serious consideration to the factors with strong influence on banks' capital adequacy.Moreover,it has significantly advanced our understanding of the variables influencing capital adequacy.

Thus, the entire study is very helpful to the supervisory authority, policy makers, commercial banks, and other researchers in learning about their impact and the connection between the capital adequacy of private commercial banks in Ethiopia and macroeconomic and bank-specific factors.

1.7. Limitation of the study

During this study, the student ran against several obstacles. It would be difficult to obtain all pertinent evidence from the appropriate banks because of their strict confidentiality policies, restricted access to nonperforming loans, and inconsistent data regarding bad debts. Because this study was restricted to private commercial banking in Ethiopia, its conclusions cannot be extended worldwide. Furthermore, this analysis is constrained to the macroeconomic and bank-specific factors that influence the capital adequacy of Ethiopian commercial banks during the previously mentioned time periods.

1.8. Organization of the Study

Examining the determinants of capital adequacy in Ethiopian commercial banks is the objective of the study. The study is organized into five chapters. Chapter one presented the introduction, problem statement, study objective, significance, and limitation.

The literature review, consisting of the theoretical review in Part one and empirical studies in Part two, followed by a knowledge gap and conceptual framework, was shown in Chapter two. Chapter three presented research design and methodology of the study, and Chapter four presented analysis and discussion of findings obtained from the study. In this chapter presents and discusses the result of model, which deals with the capital adequacy determinants, with the description of descriptive analysis, correlation coefficient analysis, diagnostic tests and result of regression model.

Chapter Five was a recap of the study, findings, conclusions, and recommendations

CHAPTER TWO

2. LITRATURE REVIEW

2.1. Introduction

Literature review is a document summarizing books, journal papers, and other published and unpublished documents that describes the existing and previous state of knowledge, categorizes literature according to topics, and identifies the need for a proposed study. The chapter contains a critical analysis of a few principal issues in an attempt to discover the dominant facts, and an overview of numerous studies, which are pertinent to numerous issues that would be determining commercial banks' capital adequacy.

2.2. Theoretical Literature

2.2.1. Definition of bank Capital

The banking sector is considered one of the key sectors. It serves as an important link in developing the financial system of any country and reflects its economic and financial conditions. It plays a significant role in various activities that set it apart from other sectors (Saleh, 2008). Banks are vital for providing financial services, offering credit, and delivering various social services. Therefore, it is crucial to communicate the performance of these banks to stakeholders, including shareholders, suppliers, customers, and others. Banking performance is a major concern for management, shareholders, and stakeholders. It measures actual results against planned goals, allowing the bank's management and others to understand the existing plan.

The definition of capital is used by national bank supervisors to evaluate the capital adequacy of banks; it comprises two groups of capital elements, known as Tiers 1 capital (core capital) and Tiers 2 capital (supplementary capital); the former group includes ordinary paid-in capital, disclosed reserves, and retained earnings, while the latter group includes undisclosed reserves, asset revaluation reserves, general provisions, hybrid capital instruments, and subordinated term debt. The total amount of Tier 2 capitals could not exceed 100 percent of Tier 1 capital.

This implies that Tier 1 (core) capital must make up at least 50% of the capital base, which isobtained by adding Tiers 1 and 2. Additionally, no more than 50% of Tier 1 capital, or 25% of capital basis, may be included in subordinate term debt with capital base.

2.2.2. Theory of Capital Adequacy

The Capital Adequacy ratio term came up in the mid-1970's as a result of banks extending the business of lending without any following extension of its capital, given that the capital ratio was equated to total capital and total assets Alsabbagh (2004). The major aim of coming up with capital adequacy regulations was to take into consideration the various risks that conventional banks were facing. The cornerstone of safety that mirrors supervisory concern is currently capital adequacy. The CAR determine if and to what extent business companies have adequate capital to contain the risks to which they are exposed. As they perceive capital as a buffer or cushion for loss absorption, regulatory authorities have thus utilized the measure of capital adequacy ratio as one of the critical markers of "safety and stability" of banks and depository institutions Abdel-Karim (1996).The amount of capital that a financial regulator must hold within financial institutions is called capital adequacy and is normally defined in terms of CAR.

Minimum capital adequacy ratios are in place to make sure banks can withstand a fair amount of losses before going bankrupt and before depositor money is lost Harley, (2011). By lowering the risk of bank insolvency, the application of minimum capital adequacy ratios contributes to the stability and effectiveness of the financial system. A bank going bankrupt could cause other banks to experience financial difficulties and possibly jeopardize the stability of the financial markets by eroding public trust in the financial system (Soludo, 2009). Thus, the central bank's implementation of minimum capital adequacy ratios contributes to the upkeep of a stable and effective financial system. Additionally, it provides depositors with some safety.

Banking efficiency and value of the soundness are among the most significant issues in the current banking sector,Bateniet.al(2014). CAR improves bankability as it gets rid of the lack of liquidity that would heighten the risk of loss;thus banks appreciate it. Its early detection keeps depositors confident and protects banks from failing due to the absence of capital. Through business arithmetic, R&D, market entry of various markets in the financial sector, and development of new bank services, today the financial scenario is altered as per the evolving face of world economies.

The Basel banking supervisory committee took steps voluntarily to safeguard banks from operational failure to deal with this sophisticated financial crisis. A framework for the calculation of banks' CAR by the Bank of International Settlements (BIS) was established for a group of ten industrialized nations (G-10),Alqasem and Alajmi (2015)

The Basel board statement by Debajyoti and Roy (2013) reveals that the Basel committee had a meeting in Basel, Switzerland, and developed the Basel Accord to calculate the CAR of the banks. The Basel committee was tasked with studying the then current position of the group of nations' current banking system and evolving suitable remedies backed by comprehensive standards for further regulation.

Three Basel standards have been developed since the beginning of the Basel committee, and each one has a different objective: to enhance the CAR in banks Gujrati, (2016). According to Salgotra and Wadhwa (2012) and Kaur and Kapoor (2014), the Basel I standard, which was implemented in 1988, required commercial banks to uphold a minimum capital adequacy ratio of 8% in its regulatory framework. More risk-sensitive capital charges that react to the risk of losses due to credit distribution of the banks' entire portfolio of balance sheet and off-balance sheet activities are the prime objective of this capital accord. Bank capital was divided into Tier one core capital and Tier 2 additional capital based on the Basel Accord True Tamplin,(2023).Common equity forms the mainstream of Tier one capital, the anchor of a bank's capital. The maximum quality capital, referred to as Tier 1 (CET1), includes common stock, retained earnings, and other items. It is the type of capital that occupiessufferers the most and is the foundation of a bank's capacity to tolerate financial pressures. They include instruments such as contingent convertible bonds (CoCos) and non-cumulative preferred stocks under additional Tier 1 (AT1) capital. These instruments come into play when a bank's capital dips below a threshold level to absorb losses by being rehabilitated into common stock. Subordinated debt, hybrid securities, and other types of capital which offer higher loss-absorbing capability are all tier two, or supplementary capital. Tier two is, however, less superior compared to Tier one.This has been standard practice for banking laws worldwide. Basel II, which was introduced in 2004, introduced more risk-sensitive approaches to capital measurement and requirements. The Basel II pact has improved banking supervision and regulation by creating a more innovative and risk-responsive regulatory structure. It was created to rectify Basel I's flaws. Sarma and Nikaido (2007) state that the agreement is built around three pillars: one regulatory, two supervisory, and three disciplinary.These pillars assist banks in developing a framework of responsibility, transparency, risk management, and disclosure standards.

Basel II made it possible for banks to respond more quickly to ongoing changes in the financial markets by implementing an operational and market risk assessment approach for figuring out each bank's capital adequacy requirements Hussien et.al (2012). It was discovered during the

global financial crisis that the Basel II committee was ineffective and unworkable in the financial industry. Basel III rules were created in 2010 by the Basel committee to reduce the probability and impact of possible future attacks.

Decisions on capitalization are essential to banks' and other financial institutions' success. Zhang et.al (2016). Strict national and international restrictions apply to banks in this context. To ensure the stability and solvency of the banking system, bank capital is governed by legislation in every nation. According to Belkhir et al. (2016), capital adequacy is the amount of capital sufficient to cover its customers by absorbing losses associated with insolvency and liquidation risks that the bank is expected to experience while extending credit. As a result, banks with inadequate capital are somewhat vulnerable because their management is constantly looking for new ways to raise money in order to protect themselves from potential risks.

The main reason banks need to maintain adequate capital is to provide them with the buffer or cover they require to withstand any unforeseen fatalities and protect bank solvency, according to Hewaidy and Alyousef (2018). For several reasons, including its impact on the bank's profit rate, Batten and VO (2019) claim that the capital adequacy ratio is the most important of the capital ratios that the BASEL committee recommends. Additionally, it is a tactic employed by banks to reduce operating losses and boost their customers' trust in their creditworthiness. Therefore, since the Basel Accord went into effect, and particularly during the US financial crisis, the majority of academics have looked into the factors that influence banks' capital adequacy because capital regulation is crucial to ensuring banks' stability Batten and VO, (2019).

2.2.3. **Capital adequacy ratio and its consequence**

A variety of prudential and financial data are included in the periodically disclosure statements that Deposit Money Banks licensed by the Central Bank are expected to provide. An important component of these disclosures is the "capital adequacy ratios" (CAR) that the banks disclose. CAR is a ratio of a bank's capital to its risk, commonly known as the Capital to Risk (Weighted) Assets Ratio (CRAR). As a percentage of a bank's risk-weighted assets, it represents the amount of core capital (Berger et al., 1995).

As a measure of a bank's capital in relation to its credit exposures, the NBE monitors a bank's CAR to make sure it can withstand a reasonable level of loss and conforms with statutory capitalrequirements. Usually, a percentage is used to express them. A bank's capital is equivalent to 8% of the size of its credit exposures, for example, if its capital adequacy ratio is 8% (Alfon et

al., 2004). Minimum capital adequacy ratios are in place to make sure banks can withstand a fair amount of losses before going bankrupt and before depositor money is lost (Harley, 2011).

By lowering the risk of bank insolvency, the application of minimum capital adequacy ratios contributes to the stability and effectiveness of the financial system. The smooth operation of financial markets may be threatened by a bank going bankrupt, which could result in other banks experiencing financial difficulties and a decline in trust in the financial system (Soludo, 2009). Thus, the central bank's implementation of minimum capital adequacy ratios contributes to the upkeep of a stable and effective financial system. Depositors are also given some protection. Depositor funds are prioritized over capital in the case of a winding-up, meaning that depositors would only suffer a loss if the bank's loss exceeded its capital.

2.3. The Macroeconomic Factors

In order to maintain price stability, ensure that public sector deficits are kept to a minimum, inhibit excessive trend in either direction, and ensure that foreign debt is sustainable, macroeconomic stabilitya component of financial stabilityrequires unconventional macroeconomic policies. Ojo and J. A. Adegbite (2010). When national savings are adequate to eliminate the need for foreign borrowing assistance, macroeconomic conditions are considered stable. In order to maintain financial stability, macroeconomic policy tools need to be appropriate and in line with the exchange rate system; otherwise, bank capital will be depleted by inflation. The financial stability model states that when the macroeconomic environment and financial institutions are stable, supervisory and regulatory measures must be preventive in nature. However, the nature of regulatory and supervisory policy must be remedial when the institutions are on the verge of instability and tend to deteriorate into instability. Moreover, resolution strategies should be followed in the event that the institutions have lost equilibrium.Ajayi (2008) All three spread, bank capital adequacy, and profit regressions contain major macroeconomic drivers. This can confirm the assumption that banks hardly ever turn a profit where there is inflation. Moreover, technological development in the banking industry that needs priority consideration is not reflective of economic growth.The regulators are highly concerned at present regarding the Banks' exposure to standby letter of credit and off-balance sheet activities. This indicates that in the majority of developing nations, including Nigeria, macroeconomic factors like exchange rates and inflation play a significant role in determining the determinants of capital adequacy Hassan(2008).

2.3.1. Real Domestic Product growth rate

Growth in GDP is a case of economic growth, which is a critical factor to include when defining CAR. According to Mili et al. (2014), banks can be safer and relax capital requirements and invest elsewhere if the economic growth of a nation is sound. However, low or negative growth rate implies a higher risk of

bank risk, therefore banks must ensure a capital ratio is adequately robust to avoid losses in the future. In contrast, empirical works by Ruckes (2004) and Aktas et al. (2015) confirmed that GDP growth is negatively correlated with CAR.Since the growth rate of GDP slowed down during the recession and banks needed to keep a lot of capital in reserve to cover losses, they needed to cut back on the amount and kinds of investments they made at the same time, which is why CAR used to rise during this period.

The measurement of economic growth is done using real GDP growth. GDP growth, according to a previous study, would increase bank capital adequacy. The default risk is lower during expansions than during recessions, which explains this. Vong, Hoi Si Chan (2008), and the demand for interest-bearing and non-interest-bearing activities may increase, and bank profitability may also rise as a result of an improved economy. GDP is a crucial metric used to evaluate an economy's level of prosperity. GDP is the most widely used macroeconomic metric to evaluate the total amount of economic activity in an economy, and its growth rate shows the business cycle phase Fadzlan&Royfaizal, (2008).Positive or negative GDP deviations typically have a significant effect on the stock market.

2.3.2. Exchange rate

When a nation's currency is exchanged for another, its value is known as the exchange rate. The relative strength or weakness of a nation's currency has a significant impact on foreign trade, the tourist industry, and the costs that its consumers must pay for imports. It is usually necessary to compare the exchange rate of one currency to that of another. The exchange rate is the element that influences the bank's capital. Williams (1998) discovered that the capital adequacy ratio and the exchange rate were negatively correlated. When exchange rate hikes cause foreign investors to limit direct investment, the capital adequacy ratio would fall.Harley Tega and Williams' (2011) study on the factors influencing Nigeria's capital adequacy ratio between 1980 and 2008 shows a negative correlation between the bank capital ratio and real domestic and exchange rates.

2.3.3. Inflation Rate

Two possible definitions of inflation are a persistent or continuing increase in the general price level or, alternatively, a persistent or continuing decrease in the value of money.

Loan-payment capacity and inflation do not always have a positive or negative connection, according to Nkusu (2011). Higher inflation could make it easier for borrowers to repay loans by reducing their outstanding real debt, but it could also make it more difficult for them to do so by lowering their real income when salaries and wages remain sticky. Moreover, Nkusu suggests that inflation lowers the ability of loan owners to pay back their debt anytime lenders modify lending interest rates to reflect their actual gain. Thus, research indicates that, depending on how well an

economy is doing, there may be a positive or negative correlation between inflation and non-performing loans.

2.4. Bank Specific Determinants

2.4.1. Bank size

The size of a small firm can be explained by the size of the bank. Taswan, 2010. Thoa & Anh (2017) use the natural logarithm of total assets to calculate the size of banks. The assets of a bank increase with its size. A bank's size is determined by the amount of assets it possesses. There are differences in the balance sheets of big and small banks. Large banks typically trade securities in an effort to make quick money, while smaller banks choose to invest in loans and securities. According to Buyuksalvarci&Adioglu (2011), bank size is important since it immediately affects who owns the bank and its capacity to acquire capital indicates that it seeks to reduce managerial risk and insolvency.According to Thoa & Anh's (2017) research, bank size has no bearing on CAR. According to Al-Sabbagh's (2004) analysis of Jordanian commercial banks, CAR was negatively impacted by bank size. According to another study by Gropp & Heider (2009), larger banks have lower capital adequacy ratios, which further implies that bank size is a crucial predictor of affecting capital risk. In their analysis of Iranian banks, Bateni, et.al (2014) calculated the size of each bank using natural logs of the total assets owned by the banks. The results demonstrated that as a bank grows in size, its capital adequacy ratio falls. Large banks have less capital than small banks because they are safer and less dangerous. Al-Sabbagh (2004) A high level of safety is shown in large banks. The bank becomes less risky and owns less CAR as a result of having sufficient capital to support any risky assets.

2.4.2. Non Performing Loan

There is no universally agreed definition of loan default (NPLs) because it is well known that what is tolerable in one country may not be in another. According to the Oxford Dictionary of Finance & Banking, Third Edition, nonperforming loans are loans whose payments are past due. Lon stops operating when it cannot be resurrected within a legitimately mandated time frame. NPLs are those for which the borrower has not made payments for a while. Non-performing loans are therefore a challengesforcommercial banks.According to National Bank of Ethiopia directive number SBB/43/2008, "nonperforming" refers to loans or advances whose credit quality has declined to the point where it is questionable whether the principal and/or interest will be paid in full in accordance with the terms of the loan or advance. When borrowers default on loans they have taken out from banks, non-performing loans pose a risk of probable bank losses,Kasmir (2010). A bank under unfavorable circumstances is more likely to have a higher percentage of non-performing loans since the credit quality of a bank decreases with the number of non-performing loans. Foreign exchange rates can affect non-performing loans in a number of ways, both positively and negatively. Nkusu (2011).Jimenez and Saurina (2006) offered evidence that real interest

rates, GDP growth, and lending conditions can all explain the non-performing loan (NPL) ratio of the Spanish banking sector. Khemraj and Pasha (2009) employ their methodology in an attempt to identify the contributing variables to the Guyanese banking industry's non-performing loans (NPLs). They discovered that non-performing loans benefit from the real effective exchange rate (REER). As a result, credit institutions' non-performing loan (NPL) portfolios ought to be in outstanding shape while the local currency is rising. The research also contains conflicting opinions regarding the correlation between the exchange rate and other variables. Khemraj and Pasha (2009) found a positive relationship between the actual effective exchange rate and nonperforming loans.

2.4.3. Return On Equity

The amount of net income returned as a percentage of stockholders' equity is known as return on equity. It is a conventional and possibly the most popular way to assess a company's overall financial performanceRappaport (1986). Because it connects the balance sheet (shareholders' equity) and income statement (net profit/loss), investors like ROE. According to Stowe, Robinson, Pinto, and McLeavy (2002), ROE's appeal to analysts, financial managers, and shareholders is further enhanced by the fact that it is the outcome of systematic financial ratio study, also known as Du Pont analysis. However, ROE may be a deceptive indicator of a company's financial health for a variety of reasons. Wet & Toit (2007).Initially, results can be brought into accordance with the law by modifying accounting rules. Second, ROE increases when financial leverage increases, provided that the returns on the borrowed funds exceed the cost of borrowing. When leverage increases above a certain point, the firm's beta, or systemic risk, may also grow. Third, ROE is susceptible to inflation as well; inflation had a negative effect on the profit margin, which will reduce ROE and expected growth, Completer and Perry (1981). This research shows that investors can construct portfolios based on a simple financial metric, like ROE, that can produce a positive abnormal return without having to perform time-consuming, tedious fundamental research.A bank's performance is gauged by its return on equity (ROE); the greater the ROE, the better the bank's performance. The net profit made by a bank and distributed to the equity holders of its shares is measured by ROE, a bank performance metric that is typically determined using the value of banking accounting. The return on ordinary shareholders' investment is measured by the return on equity (ROE), which is the ratio of net against ordinary equity. The Return on Equity (ROE) ratio is used to analyze how well a business uses its resources in order to generate a return on equity.

2.4.4. Liquidity

Through displacement of deposits, a higher capital ratio can limit the generation of liquidity Gorton and Winton, (2000). They contend that investment in bank equity capital is a weaker form of hedging for liquidity than deposits. Higher capital ratios therefore impose limits on investors' overall liquidity by moving their funds from comparatively liquid bank deposits to comparatively illiquid bank capital. According to liquidity management theory, a bank need not always maintain highly liquid assets in its balance sheet since it can always buy money from the market whenever needed.Most authors do not agree with this suggestion since the lending banks will not be able to obtain the required liquidity during a period of low profitability and low business as a result of possibly low creditworthiness and eroded market confidence. Depositors and other creditors on the liabilities side of the balance sheet, however, may provide liquidity for existing banks, Nwankwo (1991). One important aspect that influences the performance of a bank is liquidity management. The profitability of a bank has a positive relationship with its sufficient liquidity, or its ability to service the obligations of its depositorsDang, (2011).Therefore, banks must possess the right amount of liquidity if they are to yield profits. There are other ratios that can be used to compute liquidity, but some of the most common ones include total advances to total assets and total deposits to total assetsKusa and Ongore (2013)

2.4.5. Management Efficiency

The bank's ability to create and accomplish goals and objectives is a major factor in effectiveness. Efficiency is a key component of achievement assessment, which forms the basis of the performa nce of all activities. It is predicated on the idea that the ability to maximize output from available i nputs is a gauge of expected performanceOctorina and Mariam (2021)By splitting efficiency into two categoriestechnical efficiency and pricing efficiencya technique of measuring unit efficiency was developed, laying the foundation for measurement and efficiency. Furthermore, technical efficiency is defined by Farrell (1957) as the ratio of results to inputs, and the ability of the company to accomplish some outputs with the least inputsthat is, the ability to produce the maximum outputs from the fewest inputsis a measure of technological efficiency. Accordingly, Farrell (1957) states that the company is technically efficient if increasing one output necessitates expanding at least one input or decreasing at least one other output.However, the ability of the company to integrate numerous inputs in the best possible proportion (mix) with regard to pricing and production technology, spanning cost and profit efficiency, is known as price efficiency or allocative efficiency. According to Izzeldin et al. (2021), allocation efficiency is the ability to combine inputs and outputs in the best feasible proportions at present pricing. Better resource allocation, financial stability, and economic growth can all be attained through increased bank efficiency, According to Berger and Humphrey (1997).

Furthermore, because the success of any nation's economy depends on an efficient financial sector, Sharma et al. (2012) contend that the efficiency with which the banking industry is measured has a significant impact on the performance of the economy as a whole. Furthermore, due to its widespread economic significance, Jelassi &Delhoumi (2021) think that the banking industry's long-term survival is directly impacted by its stability and effectiveness. To provide the intended results, banks must be able to manage both intangible assets (such as reputation, management expertise, competencies, and intellectual property) and tangible inputs (such as capital, labor, and physical assets) Nurhadi et al., (2021). Then, by dividing bank output by bank input, the efficiency of banks is determined. Mariam and Octrina (2021).

2.5. EmpiricalReview

There are conflicting conclusions and suggestions from the empirical studies that looked at the relationship between commercial banks' banking capital and efficiency. The efficiency and capital ratio of conventional banks in China, Korea, and Brazil, for example, are positively connected, according to Banker et al. (2010). However, when Lesanovska and Weill (2016) looked at Czech and US banks, respectively, they came up with different results. Economic inflation and non-performing loans are positively correlated, according to empirical research (Khemraj and Pasha, (2009); Fofack, (2005).

In an effort to examine the factors influencing the capital adequacy ratio and its effects on the financial status of 24 chosen banks, Ahmet and Hasan (2011) conducted study on Turkish banks. SIZE, DEP, LOA, LIQ, ROA, ROE, NIM, and LEV are the nine explanatory factors used in the study, with the capital adequacy ratio serving as the dependent variable. The effect of bank-specific factors on the capital adequacy ratio has been investigated using a multivariate panel regression model. The results show that the capital adequacy ratio is unaffected by size, DEP, LIQ, and NIM. However, CAR is positively impacted by ROA, whereas CAR is negatively impacted by LOA, ROE, and LEV.

The fact that the banking industry makes up 85% of the financial sector, as suggested by Shingjergji and Hysen (2015) regarding Albanian banks, illustrates the capital market's fragility. Following the financial crisis, they investigate the factors that influence the capital adequacy of Albanian banks. Non-performing loans (NPL), return on equity (ROE), equity multiplier (EM), loan to deposit ratio (LTD), bank size (total assets), and capital adequacy ratio (CAR) are all regarded as independent factors, while the latter is seen as a dependent variable.

The association has been seen using the ordinary least square regression model. Their results demonstrate that while profitability measures such as ROA and ROE have little bearing on CAR, NPL, LTD, and EM have a major and detrimental impact on CAR in the Albanian banking sector. CAR is positively impacted by bank size as well; that is, larger banks have higher CAR. Ping-wen Lin (2002) found a statistically significant negative relationship between the cost efficiency index and bank capital, suggesting that banks are most cost-efficient when their capital is lower. Mohammed (2013) examines the relationship between capital adequacy and explanatory variables for Indonesian Islamic banking's profitability (ROA), assets earning quality (NPF), deposits structure (DEP), liquidity (FDR), and operational efficiency using multiple linear regression analysis and a pairwise correlation matrix.

The findings of the study showed that liquidity and profitability were favorably correlated with capital adequacy conditions. NPF is a measure of large quantities of money that cannot be collected and has an inverse relationship with the capital adequacy ratio. Operating efficiency and depositor funds, on the other hand, have little effect on the capital adequacy of Indonesian Islamic banks. Throughout the financial crisis, Indonesian Islamic banks had been adhering to the minimum 8 percent threshold, the report stated. The finances of Indonesian Islamic banks are sufficient to cover their liabilities and protect capital owners.

Al Omar et al. (2008) investigated the impact of bank-specific profitability ratios on Kuwaiti commercial banks from 1993 to 2005 using an unrelated regression technique. Their results show that the equity ratio, loan-assets ratio, cost of operations ratio, non-interest assets ratio, and total assets account for more than 67% of the variation in ROA. In an attempt to increase profitability, the results highlighted the need of improving capital adequacy and reducing non-interest assets. The positive contribution of the size variable (total assets) indicates scale efficiency, indicating that these firms may be able to produce higher profits as they get bigger. Karina and Anggono (2014) investigate the factors that influence the capital adequacy of 19 traditional Indonesian banks' credit risk-weighted assets. The data was analyzed using multivariate regressions in Eviews 8. The impact on the dependent variable, capital sufficiency, has been investigated using 15 explanatory variables. To test the multicollinearity problem, the researchers re-estimated the regression model and eliminated a variable.The study found that while Risk Weighted Asset for Credit Risk Ratio, Loan to Debt Ratio, and Loan to Asset Ratio LAR are positively correlated with CAR for credit risk, Net Interest Margin, Non-Performing Loan ratio, Debt to Equity Ratio, Provision of Financial Asset, and USD Growth Rate Ratio are not..

The capital adequacy ratio (CAR) for Bosnian state banks was examined by Dreca (2013) using ordinary least square regression.In contrast to loans, ROA, deposits, bank size, ROE, and leverage, loan loss ratio and net interest margin had a considerable impact on CAR. Using secondary data, Buyuksalvarci and Adioglu (2011) examined 120 observations on annual financial statements from 2006 to 2011, aiming to pinpoint the factors that influence CAR in Turkish banks. In contrast to the independent variables of leverage, bank size, loans, loan loss reserve, liquidity, and net interest margin, the dependent variable is the capital adequacy ratio. Findings from the study reveal that bank size, liquidity, and net interest margin do not influence CAR, but loan, loan loss reserve, leverage, ROA, and ROE have a significant influence on CAR.

Based on the justification given above, the researcher is interested in the effects of bank size, leverage, loan loss reserve, net interest margin, loan to asset ratio, and age. Due to their limited equity capital, banks with little leverage will find it difficult to register fresh equity growth and maintain their sustainability. According to Dickson Pastory and MarobheMutaju (2013), a rise in nonperforming loans would cause capital ratios to fall, but a greater capital ratio in banks has strengthened asset quality. In the dimension of substantial exposure to core capital, there is a negative correlation between asset quality and capital adequacy, but non-performing loans improve capital adequacy.According to Bateni et al. (2014),banksize has a negative impact on capital adequacy, while profitability (ROA and ROE) and loan to asset ratio are positive.

Jasevičienė et al. (2014) concentrated on six variables: return on assets, loans to assets, assets growth, assets valued in relation to risk to assets, the bank management impact, and the bank size versus the capital adequacy ratio in Lithuanian commercial banks.

The author computed quarterly bank data for six years, 2008-2013. Return on assets is statistically significantly negatively linked with changes in banks' capital adequacy, according to multiple regression analysis.

Yonas M. (2015) tested eight bank-specific variables spanning a decade, 2004 to 2013.The study further reveals that while ROE and NIM are negative drivers of capital adequacy and ROA, DEP and SIZE are positive drivers, while LIQ, LNTA, and LEV have no determinable effect. The Egyptian commercial banks' capital adequacy ratios are positively affected by the quality of management (earning assets to total assets ratio) and liquidity (loans to deposits ratio), while size (Ln and assets) and risk (loan loss provisions to total loans ratio) negatively affect them, as quoted by Hafez and El-Ansary (2015).

The capital ratio is significantly impacted negatively by ROE, credit risk (nonperforming loans to total loans), total deposits to total assets, and liquidity (total loans to total deposits), while being

positively impacted by ROA and bank size (Ln assets), according to Olarewaju and Akande (2016). Likewise, capital adequacy ratio-boosting elements include ROA, liquidity, net interest margin, stock market volatility, and deposit insurance ,Aktaset.al(2015). However, there are drawbacks to governance, scale, leverage, risk, and economic growth rate. From 2007 to 2012, they studied European banks. Klepczarek (2015) analyzes the factors influencing the Tier 1 ratio (core capital) of a randomly chosen sample of European banks using a completely different methodology. Size, overall risk (risk-weighted assets to total assets), and deposits to liabilities all have negative effects, according to the findings. The factors influencing the capital structure of 149 banks in the European Economic Area between 2005 and 2014 are examined by Sha'ban et al. (2016). According to their findings, the market-to-book ratio, dividends, market risk, and performance all have positive relationships with the equity ratio, while size has an inverse relationship. There is no discernible nonperforming loan ratio. They acknowledge that "large systematically important banks" engage in "moral hazard" and have a much lower capital ratio.

2.6. Gap on Literature Review

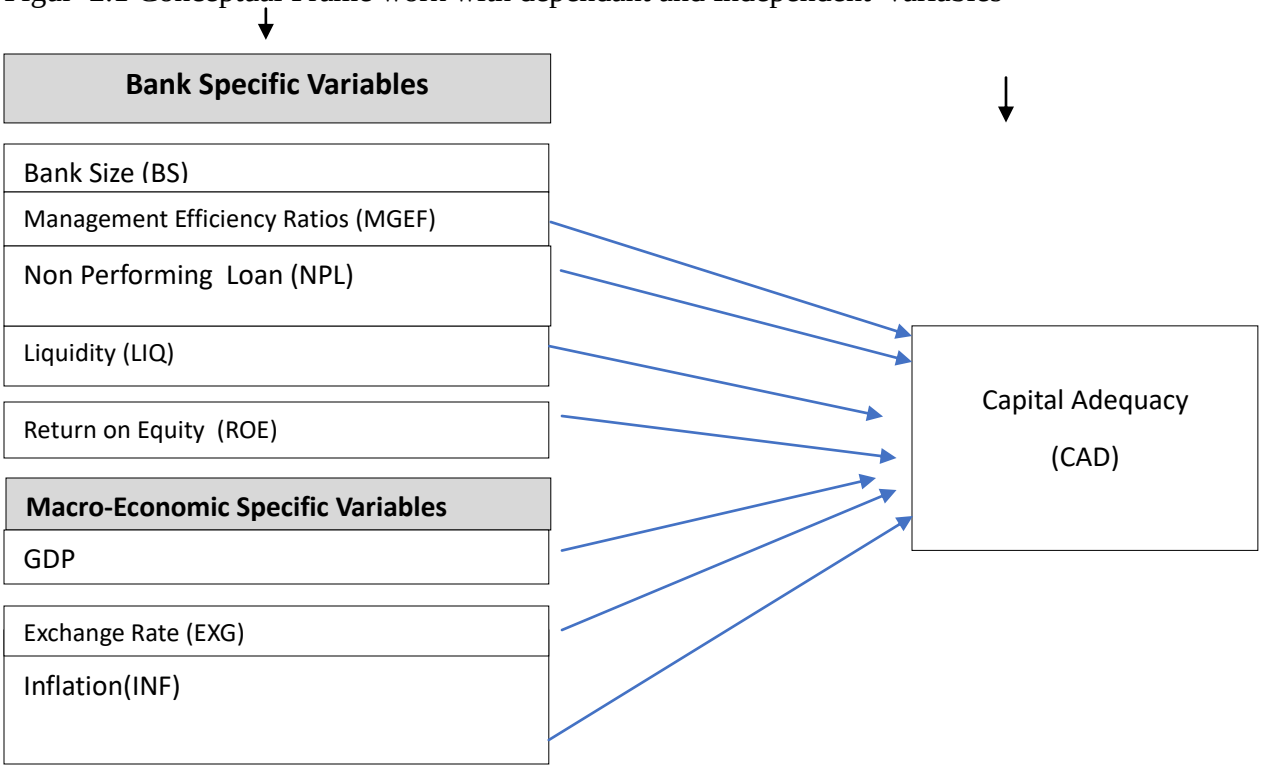
The literature study indicates that there are numerous knowledge gaps about the factors that influence the capital adequacy ratio, especially when it comes to Ethiopia. To conduct this research study, the researcher can look at a few different sections of the topic. Empirical research on the factors influencing capital adequacy has been done in South Eastern European nations, Kenya, Kuwait, Jordan, Indonesia, Nigeria, Iranian banks, the Middle East, North Africa, and some studies in Ethiopia that are not precisely about the problem but are allied to it.The literature analysis reveals, relatively little research has been conducted to determine the factors influencing the capital adequacy ratio of banks in Ethiopia. Adisalem T. (2020); Yonas M. (2015). For instance, the ratios of deposits to assets, loans to assets, assets, return on equity, return on assets, loan loss provision, GDP, and inflation. However, examining the factors that influence the capital adequacy of commercial banks is of special interest to the researcher. This industry was chosen primarily because there is a lack of study on the factors that influence capital adequacy in relation to the health of individual industries. This study was prompted by the overall dearth of research on the factors influencing bank capital adequacy ratio in the Ethiopian situation as well as the knowledge gap in the field. Consequently, the goal of this research project is to use a quantitative approach to close the knowledge gap in the field by investigating the factors that influence Ethiopia's bank capital adequacy ratio. In order to determine the capital adequacy of Ethiopia's

private commercial banks, this research paper uses a twelve-year accounting period, from 2013 to 2024

2.7. Conceptual Frame Work

A conceptual framework is a visual representation of how concepts and variables relate to each other in a research study. It is a representation of the relationship which are expected to see between the variables want to study.The followingConceptual frameworks developed based on the aforementioned literature review.

Figur 2.1 Conceptual Frame work with dependant and Independent variables



CHAPTER THREE

3. RESEARCH DESIGN AND METHDOLOGY

3.1. Introduction

This chapter discusses the research design and methodology of the study. It clearly describes the research design, the target population and the sampling design, data collection methods, as well as the methods to be used in analyzing the data and presentation

3.2. Research Design.

Plans and processes for study that cover everything from general hypotheses to specific techniques for gathering and analyzing data are known as research designs.Creswell (2009) This study's primary goal is to investigate the factors that influence Ethiopian commercial banks' capital adequacy. To accomplish its stated goals, the study employed an explanatory research design.

3.3. Research Approaches

For social and business research, Creswell (2009) outlines three traditional research methodologies: mixed methods, quantitative, and qualitative. Given that quantitative research offers a means of validating objective ideas based on an investigation into the relationship between variables, it is the primary emphasis of this study. The inherent nature of quantitative approaches is briefly explained as follows (Creswell 2009). The two forms of inquiry that are used in quantitative research design are survey design and experimental design.This method's main strength is how simple it is to gather, code, compile, and evaluate data, and how simple it is to work with numbers. Dunn (1999, p. 37). The advantage of adopting a more quantitative research approach is that it makes it possible to extrapolate conclusions from the sample to a broader population. The researcher used a quantitative research strategy, which is the best way to test a hypothesis or explanation, to achieve this goal and test the hypotheses. Creswell (2009). The researcher's goal was to investigate the variables affecting Ethiopian commercial banks' capital adequacy. As a result, this study focused on the eight factors mentioned in the hypotheses section.

3.4. Data collection

The impact of bank-specific factors on the capital adequacy ratio of banks has been examined using data from commercial banks, including Awash Bank, Abyssinia Bank, Dashen Bank, Wegagen Bank, United Bank, Nib International Bank, Cooprative Bank, Oromiya Bank, Addis International Bank, Enat Bank, Lion International Bank, Abay Bank, Buna International Bank, Global Bank of Ethiopia, Berhan Bank, and Zemen Bank, which provided audited financial statements for 12 consecutive years, from 2013 to 2024. The majority of secondary data obtained through structured document assessments comes from NBE's and the banks' own records.

3.5. Population and sample size

This research population consists of all commercial banks, both public and private, that are registered with the NBE and are accessible throughout the nation. According to the NBE (2023/24) annual report, there are now 30 private and 1 public commercial bank functioning in Ethiopia. The data used in this study analysis spans twelve years, from 2013 to 2024. 16 private commercial banks are included in the study for the purpose of examining the factors that influence capital adequacy across all commercial banks. Since the majority of the banks were newly established and the merger of Commercial Bank of Ethiopia and Construction & Business Bank did not provide the twelve years of consecutive data required for studies, the sample banks have been reduced to sixteen.

As long as the sample size is approximately 51.6% of the population, the researcher thinks it is adequate to draw logical inferences about the population. Therefore, 51.6 percent of all commercial banks are included in the sample. This indicates that any commercial bank that has been commenced operationfor at least the last 12 years (2013–2024) has been chosen. The study used audited financial statements from sixteen commercial banks that were at least twelfth years old as secondary sources of data, while the National Bank of Ethiopia (NBE) provided the external variables data.

3.6. Data analysis method

Both descriptive and inferential statistics have been used in the statistical analysis of the document review. For the sample period, descriptive statistics for the variables and various percentiles of the dependent variable were computed. A correlation matrix was also used to establish the correlation between each of the variables and the dependent variable. Using the

statistical package software "EVIEW 12," multiple regressions and the t-statistic were employed to examine the connection between the capital adequacy ratio and its possible factors.

To determine the most significant and explanatory factors affecting the capital adequacy ratio of Ethiopian banks, the researcher also used a multiple regression model. This is why my research is based on Buyuksalvarci and Abdioglu's (2011) model, which explains the relationship between bank capital adequacy and factors of capital adequacy. Furthermore, the study is explanatory in nature and used the multivariate regression model, which is described below, for quantitative analysis.

$$CAi,t = \alpha + \beta 1GDPt - \beta 2INFt - \beta 3EXGt + \beta 4BSi,t - \beta 5NPLi,t + \beta 6ROEi,t + \beta 7LIQi,t + \beta 8MGEFi,t + \varepsilon it$$

Where

CAi ,t = capital Adequacy for bank i at time t

GDPt, = Real GDP growth at time t

ER t=Exchange rate at time t

INF t = Inflation rate at time t

$BS_{i,t}$ = The natural logarithm of total asset for bank i at time t

$NPL_{i,t}$= Non-Performing Loan of bank i at time t

ROEi,t=Return on Equity ofbank i at time t

$ME_{i,t}$= Management Efficiency of bank i at time t

$LQ_{i,t}$ = Liquidity of bank i at time t

3.7. Variable Definition & Hypotheses of the Study

The objective of this study is to investigate the hypothesis that capital adequacy relationships with macroeconomic and bank-specific variables determine the determinants of capital adequacy of Ethiopian private commercial banks. Some determinant factors have a significant impact on capital adequacy in one country but not in another, and some have a positive correlation with capital adequacy in one country but a negative correlation with capital adequacy in another, according to reviews of the theoretical and empirical literature presented in chapter two.

Despite the fact that previous global research was carried out with a wide range of macrocosmic and bank-related variables, some variables were addressed in this study. Some variables that can have a significant impact on the capital adequacy of Ethiopian commercial banks were also researched in the study. Therefore, the following factors were brought forth based on previous relevant studies

3.7.1. Dependent variable

The amount of capital a bank needs to stay financially healthy and manage risk is called capital adequacy. This measure indicates how well a bank can handle losses without going bankrupt, according to Athanasoglouet.al (2005). Financial regulators set capital adequacy standards to ensure banks hold enough capital to cover potential losses from lending and other risks. To meet these requirements, banks must keep a minimum amount of capital. If they fail to do so, it could lead to regulatory action or the shutdown of the bank.. Capital adequacy is quantified in terms of

Capital Adequacy Ratio= Eligible Capital

Risk Weighted Asset

3.7.2. Independent Variables

3.7.2.1. Macroeconomic variables

A. **Gross Domestic Product (GDP)**

The economic stability and standard of living of a country are gauged by its GDP. It serves as an indicator of the level of economic activity in a country. The yearly real growth rate of the gross domestic product, or GDP, is thought to negatively affect the adequacy of banking capital. The gross domestic product (GDP) is calculated by adding the entire value of all goods and services produced inside a country's boundaries over a specific time period, usually a quarter or a year. In this study, the annual rate is employed. This comprises government spending, investments, consumption, and net exports (exports less imports).

$GDP = C + G + I + (X - M)$,

where;

C= consumption,

G = is government spending,

I = investments,

X = represents exports, and

M = represents imports.

H1: Real GDP growth rate has negative and significant impact on bank's capital adequacy.

B. **Inflation (INF):**

Inflation is another important macroeconomic factor that might have an impact on banks' capital adequacy. In the event of inflation, the central bank may increase borrowing costs and limit commercial banks' ability to provide credit. The impact of more capital will inevitably be smaller, and inflation-driven increases in living expenses will negatively impact capital adequacy. The general consumer price index, which tracks changes in a basket of household purchases, is used to measure inflation for the purposes of this study. The CPI is calculated by comparing the prices of the products and services in a basket to those of a base year..

The percentage difference between the two periods gives the rate of inflation.

H2: Inflation rate has negative and significant impact on bank's capital adequacy

C. **Exchange rate (EXG)**

Because of fluctuations in foreign currency rates, the value of the Ethiopian Birr varies in comparison to the US dollar. The international market's supply and demand balance is one of the numerous variables that affect foreign exchange rates, and it affects the capital adequacy of Ethiopian private commercial banks. The exchange is affected by a number of variables, such as supply and demand, inflation, interest rates, and geopolitical stability. The exchange rate has a significant role in international investment and trade.

Exchange rate is calculatedas:

EXG = New Exchange Rate - Old Exchange Rate) / Old Exchange Rate) x 100%)

H3: The impact of exchange rate on the commercial banks capital adequacy is negative and

Significant

3.7.2.2. Bank Specific Factors

A. Size of the Bank (SB):

Bank size is a key indicator of a bank's scale and influence in the financial system. It's generally categorized into small, mid-size, and large banks, with asset size as the primary differentiator. Asset Size is measured by Natural log of total assets of private commercial banks

One important measure of a bank's size and impact on the financial system is its size. With asset size serving as the main differentiator, banks are typically divided into three categories: small, mid-size, and large. The natural log of all private commercial banks' assets is used to calculate the bank's size.

BSZ = In(Bank Size

H4: Bank size has positive and significant impact on bank's capital adequacy.

B. Non-performing Loans (NPL):

Advances and loans with declining credit quality, as well as principle and interest that have accrued but not been paid for a prolonged length of time as indicated in the contractual payback period, are all deemed non-performing loans, according to NBE instruction No SBB/43/2008. The rise in non-performing loan portfolios was one of the main causes of the banking sector's financial difficulties. The main reason of inadequate capital adequacy is non-performing loans. Since unpaid loans and advances account for the majority of a bank's assets, their nonpayment will affect profitability and, in turn, commercial banks' capital adequacy ratio. The percentage of all outstanding loans and advances that are non-performing is what is referred to as non-performing loans in this study.

$$\text{Non-Performing Loon} = \frac{\text{long outstanding Loans}}{\text{Total Loan}} \times 100$$

H5; The share of non-performing loans in the total volume of loans & advances has negative and Significant impact on bank's capital adequacy

C. Return on Equity (ROE)

Return on Equity is a financial ratio that explains how competently a business generates income from its stock holders' equity

Return on Equity is =Net Profit

Outstanding Shares

H6: The impact of ROE on the commercial bank's capital adequacy is positive and significant

D. Liquidity (LIQ)

The ability of the bank to fulfill its financial obligations, e.g., withdrawals, lending, and others, without significant losses or disruption. Banks must have enough liquidity in a bid to guarantee their stability, development, and ability to fulfill their obligations, indirectly influencing customer confidence and financial system stability.

The ability of the bank to meet its financial obligations such as loans, withdrawals, and other undertakings without facing severe setbacks or losses. To ensure that their stability, growth, and ability to honor their undertakings all of which ultimately affect consumer confidence and financial system stability banks should maintain adequate liquidity

Liquidity ratio = Current assets

current liabilities

H7: The impact of Liquidity on the commercial bank's capital adequacy is positive and significant

E. Management Efficiency Ratio (MER).

The capacity to complete tasks with the least amount of resources and effort while optimizing output is known as management efficiency. It's about cutting waste, streamlining procedures, and successfully accomplishing objectives. The cost to income ratio is used to calculate the management efficiency ratio. This ratio shows the expenses incurred for every unit of revenue produced.

Management Efficiency Ratio = Cost

Income

H8: The impact of Management Efficiency on the commercial bank's capital adequacy is

positive and significant

CHAPTER FOUR

4. DATA ANALYSIS PRESENTATION AND INTERPRETATION

4.1. Introduction

This chapter examines the factors that influence Ethiopia's private commercial banks' capital adequacy using yearly balanced panel data from 2013 to 2024.Awash Bank, Dashen Bank, Abyssinia Bank, Wegagen Bank, United Bank, Nib International Bank, Cooperative Bank of Oromia, Lion International Bank, Oromia Bank, Addis International Bank, Zemen Bank, Enat Bank, Abay Bank, Buna International Bank, Berhan International Bank, and Global Bank Ethiopia are among the sixteen private commercial banks that are included in the cross section segment that examines the variables for each time period.

4.2. Descriptive statistics

In this part, the descriptive statistics for the independent and dependent variables used in this study are displayed. Capital adequacy is the dependent variable in this study, whereas the independent variables were GDP, inflation rate, exchange rate, bank size, non-performing loans, return on equity, liquidity rate, and management effectiveness. The mean, maximum, minimum, standard deviation, skewness, and kurtosis are among the variables in the study for which Table 4.1 presents the summary descriptive statistics.

Table 4.1: An overview of the study variables' descriptive statistics from 2013 to 2024

	CAD	GDP	INF	EXG	BS	NPL	ROE	LIQ	MGEF
Mean	0.12	0.11	0.15	3.54	10.83	0.04	0.19	0.21	74.55
Median	0.12	0.08	0.12	0.12	10.67	0.04	0.19	0.21	72.14
Maximum	0.22	0.13	0.16	12.95	12.95	0.13	0.34	0.49	151.61
Minimum	0.05	0.05	0.04	0.04	7.12	0.01	0.07	0.11	32.37
Std.Dev.	0.03	0.07	0.09	5.15	1.05	0.03	0.04	0.05	25.45
Observations	192	192	192	192	192	192	192	192	192

Source: own computation : Eview.12

According to Table 4.1, the average capital adequacy value is 0.12, meaning that the percentage of capital adequacy is 12%, above the National Bank of Ethiopia's (NBE) maximum requirement of 8%. The minimum value is 0.05, which is below the NBE capital adequacy requirement, and the maximum value is 0.22, which is above the NBE minimum requirement, with a standard

deviation of 0.034. Generally speaking, the greater the capital adequacy ratio, the greater the capacity to compensate for possible losses resulting from operational and asset shocks. This ratio is used by the National Bank of Ethiopia to gauge the level of capital adequacy in banks.

According to the National Bank of Ethiopia's (NBE) directive number SBB/78/2021subarticle 5.5, all commercial banks with licenses must maintain capital adequacy of at least eight (0.08). As a result, the ratio of regulatory capital to risk-weighted assets, which measures the minimum capital adequacy ratio required by the supervisory body and is now 8%, is all statistically above the outcome. Generally speaking, a greater ratio indicates that the bank can bear operational and financial costs.

Gross Domestic Product(GDP), is an external factor that has demonstrated 10%, 8%, 13%, and 5%, ofthe mean, median, maximum, and minimum values, respectively. In the years 2013–2024, the st.deviation was 7%.Based on the country's inflation rate, the average price of goods and services during that time was 0.145. The rate of inflation was widely distributed, showing a standard deviation of 0.08 has a higher dispersion than its mean value during the studied periods. This demonstrates unequivocally that the cost of living, as determined by the inflation consumer price index, varied somewhat more.

The standard deviation of the exchange rate was 5.1%, and the mean was 3.5%, with a minimum of 0.4 and a maximum of 13%. These showed an average 3.5% increase in the exchange value over the time. To reduce variances between maximum and minimum values, the natural logarithm of total assets is used to calculate the commercial bank's asset size (BS). The average total assets size of the selected private commercial banks in Ethiopia was shown by the mean BS value of 10.8. Awash Bank achieved a maximum total asset size value of 12.9 in 2024, while Enat Bank had a minimum total asset size value of 7 in 2013.The value of the standard deviations is 1.05. This suggests that there is a strong clustering of the data around the mean.

Conversely, the Non-Performing Loan ratio is calculated by dividing the total number of outstanding loans by the number of nonperforming loans. Table 4.1 shows that the mean NPL value is 0.044, meaning that 4.4% of Ethiopia's private commercial banks' total loans were non-performing loans. The banking industry in Ethiopia is expected to keep the ratio of non-performing loans (NPLs) at or below 5% (NBE, 2012). However, as table 4.1 above shows, some commercials with varying periods have more non-performing loans (NPLs) than the necessary hold. Therefore, NPLs continue to be a significant issue for Ethiopia's private commercial banks.

Furthermore, the variable ROE has a mean value of 0.19, a maximum of 0.33, and a low of 0.07. With a standard deviation of 0.04, the sample banks' returns on equity varied somewhat. The liquidity ratio's standard deviation and mean are 0.047 and 0.20 percent, respectively, and its minimum and maximum values are 0.10 and 0.4.

The standard deviation was 25.4, while the maximum and minimum values for management efficiency were 151 and 32, respectively. It suggests that the data is highly variable.

4.3. Correlation Matrix

Correlation can be used to assess the degree of relationship between two or more factors. The sample size is the most crucial determinant of whether the correlation coefficient is statistically significant. Two variables are fully connected in a negative linear sense when the correlation coefficient is -1 because its values are constantly between -1 and +1. Conversely, a correlation coefficient of +1 indicates that two variables are perfectly related in a positive linear sense, but a correlation value of 0 indicates that there is no linear association between two variables (Brooks, 2008).In Table4.2 correlation matrix forecasts the probable association between the study's variables. Cooper and Schindler (2009) suggest that due to the multicollinearity issue, any correlation coefficient variables with values greater than 0.8 should be adjusted. As a result, no explanatory variable in this study has a correlation coefficient greater than 0.8. Therefore, multicoleniarity is not an issue.

Table 4. 2: Correlation matrix of the dependent and independent variables

	CAD	GDP	INF	EXG	BS	NPL	ROE	LIQ	MGEF
CAD	1.000000	-0.634496	0.160973	-0.728153	0.196492	-0.078018	-0.109610	0.203540	0.439592
GDP	-0.634496	1.000000	-0.137901	0.713805	-0.103307	0.192084	0.103044	-0.107655	-0.311197
INF	0.160973	-0.137901	1.000000	-0.329280	0.758148	0.376851	-0.043854	-0.022573	-0.297701
EXG	-0.728153	0.713805	-0.329280	1.000000	-0.342055	0.082031	0.057063	-0.236706	-0.381456
BS	0.196492	-0.103307	0.758148	-0.342055	1.000000	0.365947	0.020306	-0.114517	-0.349742
NPL	-0.078018	0.192084	0.376851	0.082031	0.365947	1.000000	-0.056200	0.040957	-0.214206
ROE	-0.109610	0.103044	-0.043854	0.057063	0.020306	-0.056200	1.000000	-0.095640	0.096249
LIQ	0.203540	-0.107655	-0.022573	-0.236706	-0.114517	0.040957	-0.095640	1.000000	0.326771
MGEF	0.439592	-0.311197	-0.297701	-0.381456	-0.349742	-0.214206	0.096249	0.326771	1.000000

Source: EVIEW output from bank financial statements and personal calculations, 2024

Table 4.2 shows that BS LIQ, and MGEF were positively correlated with capital adequacy. Conversely, the explanatory factors of GDP, INF ,EXG, NPL, and ROE showed a negative connection with capital adequacy. At -0.73, the exchange rate showed the most negative connection with capital adequacy. This shows that the independent variable's correlation coefficient with capital adequacy is negative linear.

The correlation study mentioned above simply demonstrates that there is evidence of a linear relationship between the two variables and that the correlation coefficient, on average, indicates the degree of relationship between the variables' movements. It stops the researcher from drawing conclusions about the variables' cause-and-effect relationship. Consequently, while investigating how certain independent variables affect bank capital adequacy

4.4. CLR Model Assumption and Diagnostic Test

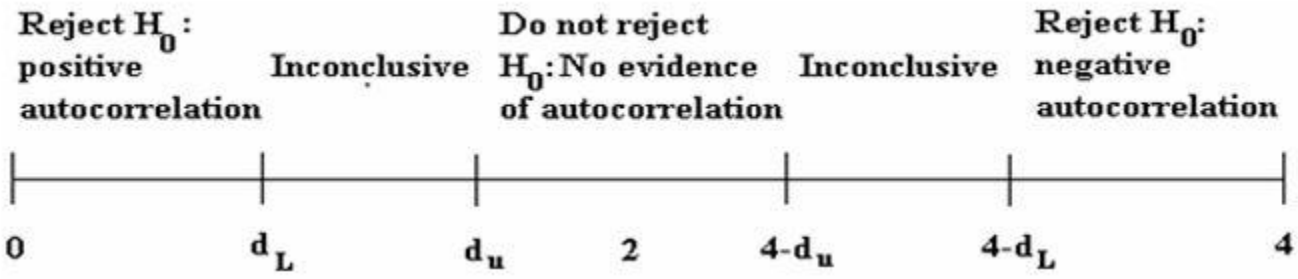
4.4.1.Test for Autocorrelation.

It is assumed that there is no correlation between the errors. The errors are assumed to be linearly independent of each other. It would be said that the errors are auto-correlated if they are correlated with each other. The Durbin–Watson (DW) statistical test was used to examine this hypothesis. The null hypothesis is accepted and the residual is autocorrelated if the autocorrelation test's p-value is higher than the significance level of 5%. The residuals are not serially correlated if the p-

value is less than 5%, which rejects the null hypothesis and accepts the alternative. A value close to 2 denotes the absence of autocorrelation, per Brooks (2008).

Table 4.5 displays the regression subsection's Durbin-Watson (DW) statistic result, which is 1.87. It is not worrisome because there is no sign of autocorrelation because it is around 2. According to Brooks (2008), there are two critical values for DW: an upper critical value (dU) and a lower critical value (dL). The null hypothesis, which states that there is no autocorrelation, cannot be rejected or not rejected. The regions that are rejected, non-rejected, and inconclusive are shown by the number line in figure 4.1 below.

Figure 4.1 Rejection and Non-Rejection Regions for DW Test



4.4.2. Multicollinearity Test

Multicollinearity is another test used in this study. The explanatory variable in the model is kept from producing two results, and the correlation between the independent variables is determined. A linear relationship between two explanatory variables is verified using this test. Brook (2008) states that we may determine that the model displays complete collinearity and cannot be estimated using OLS if an independent variable is an exact linear combination of the other independent variables. Hair et al. (2006) state that a significant multicollinearity issue is not usually indicated by a correlation coefficient of less than 0.9

Table 4-3. Correlation coefficients for checking multicollinearity

	GDP	INF	EXG	BS	NPL	ROE	LIQ	MGEF
GDP	1.000000	-0.137901	0.713805	-0.103307	0.192084	0.103044	-0.107655	-0.311197
INF	-0.137901	1.000000	-0.329280	0.758148	0.376851	-0.043854	-0.022573	-0.297701
EXG			1.000000	-0.342055	0.082031	0.057063	-0.236706	-0.381456
BS				1.000000	0.365947	0.020306	-0.114517	-0.349742
NPL					1.000000	-0.056200	0.040957	-0.214206
ROE						1.000000	-0.095640	0.096249
LIQ							1.000000	0.326771
MGEF								1.000000

Source: EVIEW output from bank financial statements and personal calculations, 2024

According to the table above, the correlation matrix for the explanatory variables in this investigation revealed that the highest correlatn, 0.75, was observed between BS and INF.

According to Hair et al. (2006) and Cooper & Schindler (2009), there is no connection greater than 0.8. The researcher can conclude that multicollinearity is not an issue.

4.4.3. Heteroscedasticity Test

The Breusch-Pagan test was used to analyze the study's assumption. Instead of being rejected and the alternative hypothesis accepted, the null hypothesis was only accepted if the observed R-squared p-value was greater than the significance level of 0.05 or 5 percent. Heteroscedasticity is the term used to describe a difference in the variance of the disturbance terms Seid, (2015). to ascertain the resulting heteroscedasticity issues. The test shows that the data has a

heteroscedasticity problem if the p-value is significant at the 95 percent confidence interval; if the value is insignificant (more than 0.05), the data does not.

Table 4.4 Heteroskedasticity Test: White

Heteroskedasticity Test: Breusch-Pagan-Godfrey
Null hypothesis: Homoskedasticity

F-statistic	1.216164	Prob. F(8,183)	0.2917
Obs*R-squared	9.692498	Prob. Chi-Square(8)	0.2873
Scaled explained SS	12.67505	Prob. Chi-Square(8)	0.1235

Source: EVIEW output from bank financial statements and personal calculations, 2024 Since there is no heteroscedasticity issue for this study, as seen in the above table, the p value is 29.17%, or (0.2917), indicating an insignificant value. For the heteroskedasticity test, the probability chi-squared guideline may be less than 0.05.Consequently, this regression model is homoscedastic and excellent. given that the chi-squared probability is 0.2873,which is greater

than 0.05.

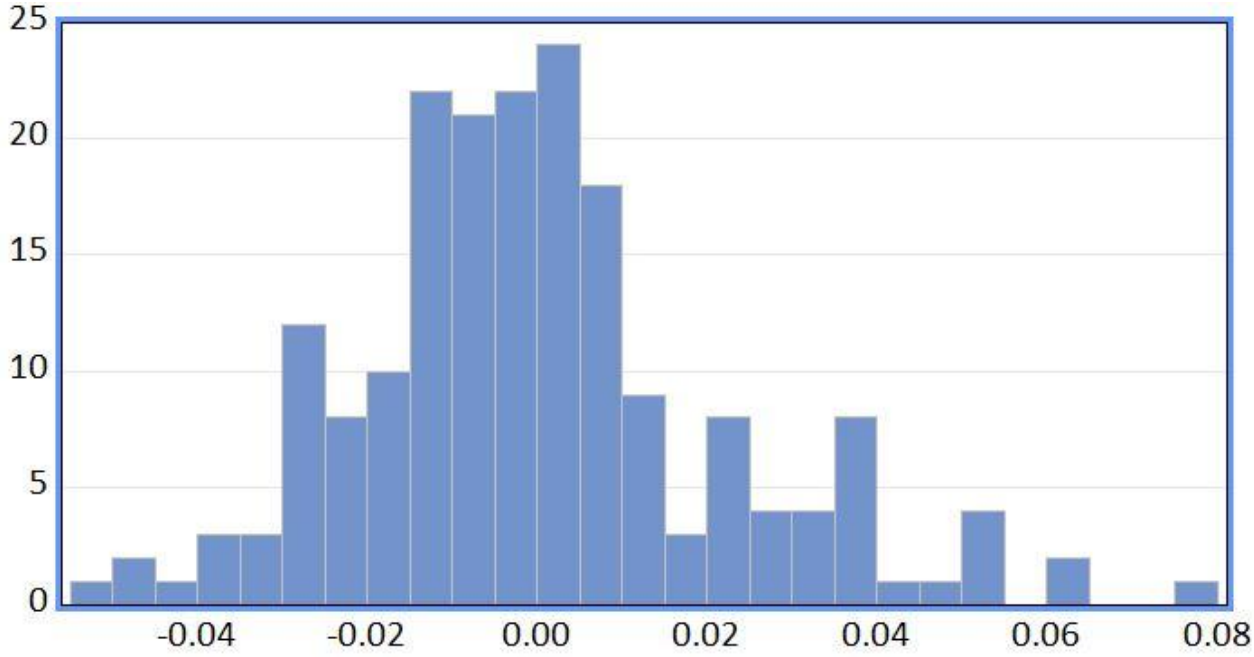
4.4.4. Normality test

The normality assumption is another crucial diagnostic test in this work. Brooks (2008) asserts that single or joint hypothesis testing for the model parameters requires the normalcy assumption (ut~ N (0, σ2)). Kebete (2014) defines a normal distribution as one that is not skewed and has a coefficient of Kurtosis in the range between 2.5 and 4. Brooks (2008) states that skewers indicate how a distribution is not symmetric about its mean value, whereas kurtosis measures how far the distribution's tails vary from the mean. The Bera-Jarque (BJ) test is the most commonly used test for normalcy. BJ makes use of a normally distributed random variable's characteristic that its mean and variance describe its distribution. Brooks (2008).

Table 4.5 :Coefficient Normality test

Variables	Observation	Skewness(pr)	Kurtosis	Pro>CHI2
Constant	192	0.6543	3.8	0.0543

Figure 4.2 Normality test for residuals



Source: E-views 12computed result

According to the preceding figure, the normality test revealed that the skewness was 0.65, the coefficient of Kurtosis was 3.8, and the Jarque Bera statistic was significant even at the 1% level of significance (P-value = 0.0543, greater than 0.05). Therefore, it can be concluded that the data is regularly distributed.

4.5. General Regression Statistical Analysis

The researcher employed a general regression model, as previously mentioned. The R2 value, which indicates the explanatory power of the model, the adjusted R2 value, which accounts for the loss of degrees of freedom that occurs with the addition of more variables, and the beta coefficient, which can be either positive or negative, are all determined using the following regression outputs. The P-value for each variable also shows the percentage or precession level at which it is significant.

Table 4.6: General Regression result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.076609	0.031330	2.445200	0.0154
GDP	-0.127758	0.036909	-3.461421	0.0007
INF	-0.029437	0.029889	-0.984881	0.3260
EXG	-0.002871	0.000575	-4.991082	0.0000
BS	0.005472	0.002679	2.042471	0.0425
NPL	-0.022492	0.064662	-2.3478	0.0283
ROE	-0.075932	0.040789	-1.861564	0.0643
LIQ	0.002429	0.037384	0.064979	0.9483
MGEF	0.000343	8.72E-05	3.932804	0.0001
R-squared	0.701366			
Adjusted R-squared	0.683940			
S.E. of regression	0.022477			
Sum squared resid	0.092454			
Log likelihood	460.8641			
F-statistic	34.50858	Durbin-Watson stat		1.87297
Prob(F-statistic)	0.000000			

Source: E-views 12 computed result

As previously mentioned, Table 4.6 provides an explanation of the general regression results of random effect regression.The R-squared, adjusted R-squared, DW, and prob. value of each explanatory variable are displayed as the results of the operational panel regression model that was employed in this investigation. The Capital Adequacy Ratio, or CAD, is the dependent variable in this instance. The model's R-squared and adjusted-R-squared statistics were 70.13% and 68.39%, respectively, as shown in Table 4.6. The R-squared shows that the model is effective in identifying the ways in which particular factors affect the capital adequacy ratio. Therefore, 70.13% of the fluctuation in the capital adequacy ratio may be attributed to the GDP, INF, EXG, BS,NPL,ROE,LIQ,andMGEF.Moreover, the computed result indicates that changes in the indepe ndent variables on the adjustedR. squared statistics account for 68.39% of the variances in capital adequacy. This shows that 70.13% of the variations in the capital adequacy ratio can be explained by the gross domestic product, inflation rate, currency rate, asset size, non-performing loans, return on equity, liquidity rate, and management effectiveness taken together.Other factors not included in the model were responsible for the remaining 29.87% of the changes. Our random effect model output, which has a DW statistic of 1.87, verifies that the residuals show either serial correlation or positive autocorrelation. The null hypothesis that all of the coefficients are

concurrently zero is rejected, and the calculated F-value of 34.5 ($p<0.000$) shows that the panel data regression is significant overall.The coefficient estimates in Table 4.6 show that whereas BS (SIZE) and MGEF have a positive and significant impact on the capital adequacy ratio, variables like GDP, EXG, NPL, and ROE have a considerable negative impact.

With corresponding p-values of 0.0007 and 0.0001, GDP and management effectiveness were significant among the relevant factors at the 1% significance level. Furthermore, the exchange rate is significant at the 0% significance level due to the variable's p-value of 0.0000. The p-values for the aforementioned variables were 0.0425 and 0.0283, respectively, indicating that bank size and nonperforming loans were significant at the 5% significance level. The ROE rate funding was noteworthy at the 10% significance level, to sum up (p-value=0.0643).

These factors taken together provide a compelling explanation for the capital adequacy of Ethiopia's private commercial banks. The null hypothesis, which claims that the R2 is equal to zero, was rejected at 1% by the F-statistic (the all-factors test of significance) since the p-value was small enough. According to the data in table 4.6, the F value of 0.000, which denotes significant statistical significance, improved the validity and reliability of the model. Every independent variable, except for liquidity, affected capital adequacy in a way that was statistically significant. GDP and the currency rate, excluding inflation, had the largest effects on capital adequacy of the three macroeconomic independent factors examined in this study.

Empirical model: As mentioned in the third chapter, the general regression model found in the study to identify the variables that can affect the capital adequacy of Ethiopian banks is as follows.

$$CAi,t=0.076609--0.127758GDPt--0.029437INFt--0.002871EXGt+0.005472BSi,-$$

$$00.022492NPLi,t- 0.075932ROEi,t + 0.002429LIQi,t + 0.000343MGEFi,t+ \varepsilon it$$

4.5.1. Result of Regression Analysis of Each Variable

4.5.1.1. MacroEconomic Factors

The researcher has addressed the following external explanatory research aims under this section:

A. **Real Domestic Product GDP**

At the 1% significance level, the researcher found that real GDP has a statistically very significant and negative influence on capital adequacy (P-value=0.0007). Controlling for other variables, the

dependent variable, capital adequacy, would be expected to decline by about 0.13 units with every increase in GDP, according to the coefficient of the regression equation for the independent variable GDP at -0.127758. The Ethiopian economy experienced an economic downturn or financial stress in the banking sector during the period of study despite the fact that banks increased their capital bases to comply with requirements from the regulatory bodies. Such negative correlation between GDP and capital adequacy can be expected.

Companies are able to make losses when GDP is low, thus lowering capital adequacy as loan defaults are high. This can therefore negatively affect banks' ability to lend and stimulate economic growth. Scholars like Ruckes (2004) and Aktas et al. (2015) theorize that there is a negative correlation between capital adequacy and GDP growth.

The standard errors the coefficient estimate deviates from the null hypothesis are represented by the t-Statistic value -3.461421. The t-value -3.46142 here indicates that capital adequacy is significantly impacted.

In summary, these statistical findings suggest that GDP has a statistically significant adverse effect on the dependent variable, CAD, within the study period of private commercial banks

B. **Inflation**

Although it was expected that the inflation coefficient would be negative, this was not the case. Inflation therefore has little effect on the capital adequacy of Ethiopian commercial banks. The results indicated that the capital adequacy of Ethiopian banks is unaffected by inflation, and p-values of 0.3260 indicated that the parameter for this variable is not significant. about how CAD is impacted by inflation.

C. **Exchange rate**

At the significance level of 0%, the researcher found that the exchange rate had an extremely high statistically significant and negative coefficient on capital adequacy (P-value=0.0000). Keeping all other variables at a constant, the dependent variable Capital Adequacy should fall by about 0.003 units when the independent variable EXG increases by one unit according to the coefficient of the regression model -0.002871. Because depreciation in a home currency might reduce the value of foreign assets, the capital level of a bank might be influenced by the exchange rate, and this could become apparent in the form of a negative relationship between EXG and capital adequacy.

This is thus unfavorably consequential to the ability of the bank customers to import, hence lowering the financial performance of the commercial banks. Harley and Williams (2011) found a negative correlation between the bank capital ratio and actual domestic and exchange rates.

The standard errors the coefficient estimate deviates from the null hypothesis are exhibited by the t-Statistic value of -4.991082. Here, t-value of -4.991082 shows that capital adequacy is significantly impacted. Finally, based on these statistics, it can be inferred that the exchange rate had a statistically significant negative impact on the dependent variable**,** CAD, in the regression model during the period under study for private commercial banks.

4.5.1.2. Bank Internal Factors

A. Bank Size

One of the Internal variables in this study is asset size. The results of the regression show that, at 5% significance level, bank size is very statistically significant and positive in its impact on capital adequacy (P-value = 0.0425). Holding all else equal, the dependent variable (bank capital adequacy) is expected to decrease by approximately 0.0055 units for each unit rise in BS as per the coefficient of 0.005472 of the independent variable bank size as per the regression model. Banks typically increase their capital adequacy ratios through a rise in equity capital or by reducing risk-weighted assets on their balance sheets. This positive relationship between bank size and capital adequacy can be true as asset size did influence a bank's capital adequacy ratio. Retaining earnings, issuing new shares, selling off some of the assets, or cutting back on risky assets are some ways in which this is achieved.

The standard errors of the null hypothesis from the estimate of the coefficient are seen in the t-Statistic value of 2.042471. Here, the capital adequacy is observed to be being significantly positively impacted by the t-value of 2.042471. From these statistics, it can be understood why size of assets has a significant positive impact on the dependent variable, CAD, in the regression result during the research period of private commercial banks.

B. Non- Performing Loan

On the basis of regression analysis at a significance level of 5%, nonperforming loans hold a very high statistical significance negative correlation with capital adequacy (P-value = 0.0283). On a regression equation, independent variable NPL carries a coefficient value of -0.022492, i.e., controlling all other variables, dependent variable Capital Adequacy decreases by about 0.022 units for every one unit increase in NPL. The standard errors of coefficients different from the

null hypothesis are depicted by the t-Statistic value of -2.3478. The t-value of -2.3478 depicts that it has a significant effect on capital adequacy in the opposite direction.

There was a negative correlation between non-performing loans (NPLs) and capital adequacy when commercial banks were forced to reduce their capital adequacy ratio to allow them to set aside more for loan loss provisions. Secondly, banks' capital reserves can be absorbed by higher operating costs, such as attorney fees and collection costs, arising from higher non-performing loans. Third, rising non-performing loans (NPLs) reflect declining asset quality that affects the capital adequacy of a bank by affecting the value of its assets. Fourth, rising non-performing loans (NPLs) can alert investors that a bank has financial pressures, hence lowering share prices and hence affecting capital adequacy.

Last but not least, it is clear from statistical results that NPL exerted a statistically significant negative influence on the dependent variable, CAD, in the regression analysis during the study period. With similar out come Dickson Pastory and MarobheMutaju (2013) determined that while a rise in nonperforming loans tends to deteriorate capital ratios, banks' higher capital ratios have resulted in asset quality improvement

C. Return on Equity

Here, the association between Return on Equity (ROE) and capital adequacy (CAD) is negative, or at 10% significance level, has statistically significant and negative effect on capital adequacy (P-value = 0.0643). According to the coefficient -0.075932 of the independent variable ROE in the model, ceteris paribus, the dependent variable Capital Adequacy will decline by about 0.076 units for a corresponding increase in ROE by one unit. Return on equity can determine capital adequacy for a bank, as the negative correlation between ROE and capital adequacy suggests.

It was reasoned that a low capital adequacy of commercial banks might be a pointer towards the fact that the banks are overborrowed or that their liquidity management is not adequate to bear their risk. A high proportion of capital adequacy, on the other hand, shows a good state of affairs and less chance to become bankrupt. It is less sensitive to economic recession and unforeseen tragedies, though the ROE would be reduced in that case owing to the dilutive effect of larger capital. The philosophy that ROE and capital adequacy have an inverse relationship implies that banks with greater capital adequacy will have less ROE and banks with less capital adequacy will have improperly high ROE as a result of leverage (i.e. borrowed capital).

Shingjergji and Hyseni (2015) also made it clear that the ROE is not found to have a statistically significant effect on bank capital adequacy. The standard errors of estimate of the coefficient in the null hypothesis are expressed in terms of the t-Statistic value of -1.861564. The t value of -1.861564 here reflects that the capital adequacy is being negatively affected. The dependent variable CAD in the regression model is statistically significantly negatively impacted by ROE, according to the statistical regression results during the study period for private commercial banks.

D. Liquidity

In accordance with the seventh hypothesis of the study, liquidity has no effect on the capital adequacy ratio. The impact of liquidity on capital adequacy is statistically insignificant, even at the 10% significance level (P-value = 0.9483). The magnitude of the bank's liquidity ratio has no bearing on the capital adequacy ratio, according to this. Unfortunately, the capital adequacy ratio is much enhanced by liquidity, according to Thoa & Anh's (2017) study. An investigation by BuyuksalvarciAdioglu (2011), which found that liquidity had no effect on the capital adequacy ratio, supports the results of this study.

The findings of Irawan &Anggono's (2015) study, which found that only liquidity had no impact on the capital adequacy ratio (probability value of 0.67), are likewise in line with this.

E. Management Efficiency

The final internal component in this study, though significant, is management efficiency. The regression results reveal that, at the 1% significance level, management efficiency has a highly significant and positive effect on capital sufficiency (P-value = 0.0001). The regression model's coefficient of 0.000343 for the independent variable MGEF indicates that, when all other factors remain constant, the dependent variable—the banks' capital adequacy—will decrease by about 0.000343 units for every unit increase in MGEF.

There is a positive link between capital adequacy and management efficiency. This means a bank's capital adequacy ratio is influenced by management efficiency. A strong positive relationship exists between MGEF and capital adequacy. Management efficiency improves due to better resource use and increased profitability, which can lead to higher capital adequacy. Here are a few ways that capital adequacy and management effectiveness may work together: First, a well-managed commercial bank allocates its resources to maximize returns and minimize risks. This

can lead to higher profitability, which can boost capital adequacy through stronger cash flows and increased retained earnings.

On the other hand, sound management practices involve making strategic choices that support the bank's long-term survival and growth. Well-thought-out plans that increase revenues and enhance risk management can benefit capital adequacy ratios. Effective cost control methods also play a role in efficient management by reducing wasteful spending and increasing profitability. Higher profits from lower operational costs can strengthen the capital base of banks. Additionally, effective risk management helps identify and address risks that could threaten the banks' financial health.

By managing risks well, businesses can protect their capital and maintain safeguards to handle unexpected challenges. Companies with strong management practices are generally more likely to have better capital adequacy ratios because they can effectively manage risks, generate sustainable earnings, and make strategic decisions that ensure long-term financial stability. The standard errors of the coefficient estimate's deviation from the null hypothesis are represented by the t-Statistic value of 3.932804. The t-value of 3.932804 in the regression results indicates that capital adequacy is significantly and positively affected. These statistical findings help explain why management effectiveness has a statistically significant positive effect on capital adequacy during the research period of private commercial banks.

CHAPTER FIVE

5. FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1. Introduction

The main findings and thesis of the inquiry are outlined in this chapter. It discusses the findings, conclusions, and suggestions of the study. Consequently, this chapter is divided into three parts. Findings are discussed in Section 5.2, conclusions are presented in Section 5.3, and recommendations are discussed in Section 5.4.

5.2. Findings

This study's primary objective, as mentioned in the first chapter, was to determine the variables affecting Ethiopia's private commercial banks' capital adequacy. To accomplish this overarching objective, eight research hypotheses were developed for the study, as was indicated in the previous chapters (chapter 1). The hypothesis outcome based on study results is displayed in Table 5.1 below. the table shows the macroeconomic and bank factors that affect the capital adequacy ratio. In conclusion, return on equity, GDP, liquidity rates, and non-performing loans all have a significant negative influence on capital adequacy, whereas effective bank size management has a favorable effect. Unfortunately, the capital adequacy of commercial banks is not much impacted by variables like inflation and liquidity. Table 5.1 shows the results of hypotheses, which display how every determinant affects the return on assets and the corresponding coefficient.

Table 5.1. Results for the Hypothesis

Hypothesis	Coefficient	Conclusion
GDP with Capital Adequacy	Negative	Significant
Inflation With Capital Adequacy	Negative	Insignificant
Exchange rate with Capital Adequacy	Negative	Significant
Bank Size with Capital Adequacy	Positive	Significant
Non Performing Loan with Capital Adequacy	Negative	Significant
Return on Equity with Capital Adequacy	Negative	Significant
Liquidity with Capital Adequacy	Positive	Insignificant
Management Efficiency Capital Adequacy	Positive	Significant

Source: EViews results from bank financial accounts and personal calculations, 2024

5.3. Conclusion

The results show that management effectiveness, exchange rate, and GDP growth rate significantly influence the capital adequacy of commercial banks in Ethiopia. Additionally, bank size, nonperforming loans, and return on equity significantly influence the capital adequacy of commercial banks in Ethiopia. The capital adequacy, on the other hand, is not influenced significantly by liquidity or inflation. This implied that the capital adequacy ratio of commercial banks in Ethiopia has been driven by bank growth and management effectiveness.

The total of all of the capital needed to counterbalance the exposure of a financial institution to operating, credit, and market risks in a manner that it bears possible losses as well as protects its debt holders is called capital adequacy. Banks and regulating bodies make use of the capital-risk asset ratio to quantify the capital adequacy. The capacity of management to handle marginal capital needs, balance sheet composition, capital quality and its availability to the capital markets, assets size, and loan procurement capacity are all factors that make up for capital adequacy.

Regarding examining capital adequacy of Ethiopian commercial banks, macroeconomic variables GDP and foreign exchange rate have statistically significant negative effects (p. values = 0.0007 and0.000, respectively). Bank size and management efficiency are the two bank-metric explanatory variables with statistically significant positive effects in determining capital adequacy of Ethiopian commercial banks (p.vale = 0.0245 and 0.0001, respectively). But, in the case of measuring Ethiopian commercial banks' capital adequacy, NPL and return on equity have statistically significant negative effects (p.value = 0.0283 and 0.0643, respectively).

5.4. Recommendation

As far as Ethiopian commercial banks are concerned, the study's findings are precise. Article 5.5 of the NBE directive No. SBB/78/2021 requires Ethiopian commercial banks to hold their capital adequacy ratio at least at 8%. To ensure the safety of the banking system and avoid financial crises, Ethiopian commercial banks should hold or increase their capital adequacy ratio.

Regression test indicated that NPL variable has a negative impact on the capital adequacy ratio significantly. Nonperforming loans can have a negative influence on the bank's capital, and it will be more difficult for banks with a financial crisis to increase their capital adequacy ratio. Commercial banks and the supervisory body (NBE), when they calculate their capital adequacy ratio, should give NPL more weight as it significantly impacts banks overall. Managerial

efficiency and the capital adequacy ratio have a high correlation as per the the study found. As expenses increased, CAD also increase the. So pursuing the findings noted that banks are required to use cost optimization to mobilize resources efficiently and increase profitability. This can generate enough extra capital. Therefore, it is possible to assume that the National Bank of Ethiopia possesses a good system of control. Moreover, NBE should adopt Basel III in order to categorize the minimum capital adequacy ratio according to its applicable capital Tier component. The researcher concludes by pointing out the critical necessity and significance of carrying out additional research work to incorporate other variables that have not been touched upon in this study. This will generate more awareness of banking and finance, improving the competitive positions of banks vis-à-vis domestic and foreign institutions.

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