DEBRE BIRHAN UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

The Effect of Bank Regulation on Financial Performance of Private Commercial Banks in Ethiopia

A Thesis Submitted to Department of Management, College of Business and Economics in Debre-Biran University in partial Fulfilments of the Award of Masters of Business Administration

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DEBRE BIRHAN, ETHIOPIA

JUNE 2024

DECLARATION

This research is my original work and has not been presented for any other degree in any university and that all sources of material used for this study have been properly acknowledged.

Declared by

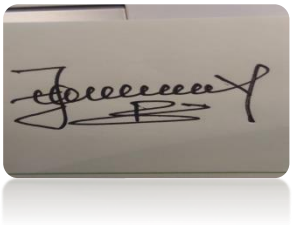
Name: Desta Yeshitla

Signature _____

This is to certify that the above statement made by the candidate is correct to the best of my knowledge.

CERTIFICATE

This is to certify that this thesis entitled **"The Effect of Bank Regulation on Financial Performance of Private Commercial Banks in Ethiopia** Embodied the work carries out by **Desta Yeshitla** herself under my supervision and that is worthy of consideration for the award of the Master degree.



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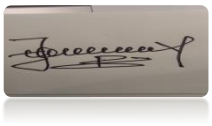

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Abstract

This study aims to examine the effect of banking regulations on the financial performance of 16 private commercial banks in Ethiopia. To achieve this objective, the study employed panel data analysis of sixteen private commercial banks spanning five years' period. In this study explanatory research design was applied using random effect robust OLS regression. The findings of the study highlight the substantial influence of regulatory frameworks on bank operations and profitability. By elucidating the intricate dynamics between regulations and financial outcomes, this study contributes to a deeper understanding of regulatory effects in the banking sector. The descriptive results of the study offer insights into the general trends and characteristics of data collected from Ethiopian private banks, providing a comprehensive overview of key variables. The variables Capital Adequacy Ratio (CAD), and Asset quality (AQ), legal reserve (LGR) and income diversification are important metrics for assessing bank performance (ROA). Based on the study results, recommendations are made for Ethiopian private commercial banks and policymakers to focus on maintaining capital reserves, managing asset quality, and implementing income diversification and mantling optimum reserve requirement to improve overall performance and regulatory compliance.

Key words: Financial Performance, Bank regulation and Private commercial banks

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Chapter One

Introduction

1.1 Background of the Study

The Ethiopia financial sectors comprise banking, microfinance, capital goods and financing, and insurance sectors, all are regulated and supervised by the national bank of Ethiopia (NBE, 2023). The banking sector is a vital component of financial institutions that influence the direction of financial markets, which is essential for the success of economic development, particularly in developing nations where a lack of cash makes it difficult to invest in capital (Jundi & Anwar, 2023).Banking industry have an important task in economic development and exchange of funds from within and outside the country and transferring such funds to various sectors of the economy (Freixas &Rochet, 2008). Banks also have a great role in the allocation of capital in the economy and occupy an intermediary place in the payment and settlement of the country's economy, the business of banking has many characteristic, which if not managed appropriately, have the potential to the general financial system and macroeconomic insecurity. The cost of the financial system and macroeconomic instability to the general public and the government is significant; it is essential to ensure the safety, soundness, and stability of the banking system (NBE, 2008).

The Ethiopian financial sector is characterized by improvement from time to time but with a low level of development and is relatively closed to its East African neighbours. When financial systems perform these functions poorly, it hampers economic growth, holds back economic opportunities, and destabilizes economies (Mekonen, & Melesse, 2014).

In this recovery period of the global financial crisis, many countries are aiming at stabilizing their economies by strengthening financial regulation (Celestine, 2020). Regulation enhances the sustainability of Microfinance and banks, since it requires formal ownership and governance structures that are vital for continued sustainability to be defined in Kenya (David & Muendo, 2018). In absence of regulations, financial systems in any country are un-established and this triggers crises that effect the entire economy as evidenced by Global economic crisis which started in the year 2007 (Spratt, 2013). According to Ping (2014), Maintaining economic stability

markets. The failure to sustain economic stability can hinder economic growth, discourage investments, and consequently adversely impact the general standard of living; Economies strive to achieve stability to create an environment conducive to sustainable growth and prosperity.

In this regard Economic stability is a complex objective, and achieving it requires a combination of macroeconomic policies, regulatory measures, and effective governance. Central banks, fiscal authorities, and other policymakers play crucial roles in maintaining economic stability through measures such as monetary policy, fiscal policy, financial regulation, and structural reforms.

In Ethiopia, the National Bank of Ethiopia has been issuing various directives and memos for regulation and supervision to ensure the safety, soundness, and stability of the banking system (NBE, 2008). For instance, the policies try to balance inflation control following money devaluation, by increasing deposit interest; regulate newly emerging banks to join the industry by making the initial capital higher and limiting a credit cap growth .

The different directives obliges on banks have various results on the performance of the banking industry positively and negatively; some had unexpected consequences on the banking system. So, the research was addressed the effect of national bank regulations on private commercial banks of Ethiopia, during the period 2018 to 2023, by employing different measures to various determinant variables.

Therefore the purpose of this study was to examine the effect of capital adequacy requirement, Asset quality, Legal reserve requirement, reserve requirement, Liquidity requirement, Bank size, income diversification and market concentration on Ethiopian commercial banks financial performance.

1.2 Statement of the Problem

Banks have a great role in the economic development process and stability of the economy by playing the main role of an intermediate channels between saving and investment in a country's economy (Elias, 2022). It affects long-term economic growth through its effect on the efficiency of intermediary between the savers and final borrowers of funds, affecting there by the productivity of the capital employed; and through its implications on the volume of saving, which influences the future income-generating capacity of the economy.

The government sets various policies in financial sectors to regulate and control stability of the economy such as restriction on banks and on like to commerce, limitation of foreign entry on banking industry, interest rate regulation, requirement of purchasing NBE bill, prudential regulation of bank, capital requirement, limit and Directed credits, reserve requirement, liquidity requirement and provisions for loss on loan or advance (Shimels, 2016).

According to Casu et.al (2006), Banking regulations have evolved to serve many goals, which changed over time and have even been in disagreement, because of the potential for disagreement among regulatory goals and the effect of the regulation on bank's efficiency. One necessary goal of banking regulation is to define or alleviate crises that might reason for systemic fall down of banks and even the economy and to create a regulatory framework that encourages efficiency and competition and ensures an adequate level of banking services throughout the economy (Shimels, 2016).

While all agrees on ensuring financial stability of banks using financial regulation, there are still contradicting empirical findings about the effect of bank regulation on commercial banks financial performance both locally and internationally. Stringent regulation improves the overall performance of the bank through entry barriers on new comers reduce competition in the banking industry and it makes banks to have more prudent lending and reducing the risk of banks (Simeneh,2020). Another studies by Chrispinus (2019), Haque and brown (2016) and Klomp & Haan (2015) revealed that stricter bank regulation improves the banks performance and reduces the risk of banks.

On the other hand, in contrary to the above findings, different scholars states that stringent regulation affects the banks' performance negatively because of greater fee requirements and

corruption by the government, entry barriers reduce competition which impedes banks from innovation and efficiency, forces the banking industry to use the most costly financing source (equity than deposit) and leads risky portfolio selection to compensate the high cost and risk take due to high capital requirement which leading poor bank performance.

In addition to this findings by Wiley and Navickas (2021) Criticize imposing too much financial regulation by arguing that if there is increased regulation generally it implies that a greater workload for individuals in the economic services given that it takes time and effort to adjust business techniques that comply with the new guidelines without delay therefore it might trigger delays in the financial system since you need to train another group of workers or launch some so that the institution might adapt with the set policies. When the government places in too much of regulations they can suppress down advancement and drive up expenses while too little can result in mismanagement, corruption and collapse of the financial system.

Similarly the Ethiopian banking sector operates under a regulatory framework that aims to ensure financial stability and protect the interests of depositors and stakeholders. Even though financial regulation is in fact not the only factor, it is one of significant factors affecting the profitability of commercial banks either positively or negatively. However, the specific impact of bank regulations on the financial performance of private commercial banks remains subject of investigation.

Despite the fact that the factors affecting the financial performance of commercial banks have been over-researched, there still remains a gap in understanding the impact of financial regulation on their performance. While there have been a few studies that have assessed this impact, they have resulted in contradicting findings.

According to empirical studies conducted by Jundi and Anwar (2023) and Tesfaye and Abdurazak (2018), reserve requirements have a positive effect on the profitability of commercial banks. However, Elias and Hailu (2022) found a negative and significant effect of reserve requirements on the financial performance of Ethiopian banks. Similarly, Jundi and Anwar (2023) and Tesfaye and Abdurazak (2018) reached contradictory conclusions regarding the effect of minimum capital requirements on financial performance. While the former found a

negative and significant relationship, the latter found a positive and significant association between minimum capital requirement and banks' financial performance.

Furthermore (Eden, 2014), found that monetary by national bank regulation has a negative significant effect on the banks performance.

Therefore, this study seeks to fill the gap by providing full information about the effect of bank regulation on banks financial performance by examining the untouched one and replicating the existing through including additional explanatory variables including income diversification and bank size as a firm specific variables as well as market concentration as industry specific variable.

1.3. Objective of the Study

1.3.1. General objective

In the context of the problems highlighted above, the general objective of this research was to investigate the effect of bank regulation on financial performance of Ethiopian private commercial banks.

1.3.2. Specific objectives

The specific objectives of this research was including of the following:

- ✓ To examine the effect of capital adequacy requirement on banks financial performance.
- ✓ To investigate the effect of asset quality on banks financial performance.
- ✓ To assess the effect of reserve requirement on banks financial performance.
- ✓ To examine the effect of liquidity requirement on banks financial performance.
- ✓ To determine the effect of legal reserve on banks financial performance.
- ✓ To investigate the effect of income diversification on banks financial performance.
- ✓ To investigate the effect of Market concentration on banks financial performance

1.4. Hypotheses of the study (HP)

In line with the general objective of this study, the following null hypotheses were also formulated for investigation.

HP 1: There is no significant relationship between bank profitability and capital adequacy requirement

HP2: There is no significant relationship between asset quality and profitability of Ethiopian banks.

HP 3: there is no significant relationship between reserve requirement and profitability of Ethiopian banks.

HP 4: There is no significant relationship between liquidity requirement and profitability of Ethiopian banks.

HP 5: There is no significant relationship between legal reserve and profitability of Ethiopian banks.

HP 6: There is no significant relationship between income diversification and profitability of Ethiopian banks.

HP 7: There is no significant relationship between Market concentration and profitability of Ethiopian banks

1.5. Significance of the study

The research may contribute the following significances for banks stakeholders.

- The finding from this research will have a great value to solve the problem encountered by Ethiopian commercial banks with regarding to NBE regulation and their development.
- It gives idea for policymakers or regulatory bodies on the effect of the policy on the performance of the banking industry to take precondition and high consideration at the time of policy formulation and implementation.
- It gives idea for potential shareholders (investors) about the Ethiopian bank regulation and its effects on the bank financial performance before and investment.
- It benefits academicians and researchers to serve as reference material for those interested to conduct future study in the area.

- It supports banks in decision making and to use efficiently and effectively gain opportunities from the bank regulation. It helps to know the challenges & give appropriate action that occurred due to regulation and exchange feedback with the regulatory body. It also helps to know the effect of the policy related to their performance and gives an idea in the improvement of the regulation.

1.6. Scope of the study

This paper was confined in identifying and examining about the effect of NBE regulation on financial performance of private commercial banks in Ethiopia by considering Seven independent variables namely: minimum capital requirement, asset quality, deposit requirement, reserve requirement, liquidity requirement, income diversification and bank size. The researcher was collected and used data for this study purpose five consecutive years from 2018 to 2022 from Ethiopian private commercial banks.

1.7. Limitation of the Study

The privacy and confidentiality concerns obtain a complete data of each bank for number of years was challenging, but the researcher tried to use the banks website and access the financial statements from National Bank of Ethiopia. Despite these limitations, the researcher was able to strives and provide valuable insights within the defined scope.

1.8 Organization of the Study

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

1.9. Definition of Terms

The following words and phrases have the under mentioned meaning throughout this research;

Bank regulation: is a form of National Bank regulation which subjects banks to certain requirements, restrictions and guidelines, designed to create market transparency.

Loan loss provision: means a bank create a loan loss provision to set aside funds for default or problem loans.

Financial performance: is a complete evaluation of a bank's overall standing in categories such as assets, liabilities, equity, expenses, revenue, and overall performance.

Private Commercial Bank: is a category of banking that aims to provide privileged services to its customers that primarily owned and operated by private individuals and business organizations.

Liquidity: refers to the ease with which an asset, or security, can be converted into ready cash.

Chapter Two

Literature Review

2.1 Regulation and Financial performance of Commercial Bank

2.1.1. Minimum Capital and Capital adequacy Requirement

According to Casu, Girardone & Molyneux (2006), Regulators puts minimum capital requirements because these banks have sufficient resources to bear losses incurred from bad loans or other activity. As such, banks require generating sufficient performance for their equity to increase in value to increase new shareholders as well as maintain established shareholders.

Minimum paid-up capital is required for banks to further improve the financial flexibility and soundness of banks and the banking system. Existing strong capable and well-capitalized banks are necessary for further mobilization of resources and meeting the financial needs of the rising national economy (NBE, 2021).

Capital requirement refers to minimum ration of capital that a bank must hold to ensure that it can absorb unexpected losses and remain solvent. The national bank of Ethiopia which is the mayor of the banking sector set capital adequacy of the banking sector to be at minimum 8%. It acts as a buffer against financial risks and helps protect depositors and creditors.

Dill (2020) Stated that the banking law by applying regulations define what constitutes capital for capital adequacy purpose and the minimum amount of capital that banks must preserve to be in fulfilment with capital regulation. Minimum capital requirements are seen as the most successful and popular tools of banking supervision, as the assurance that banks have bumper to absorb unpredicted losses (Bikker&Bos, 2008).

As funding through capital is comparatively costly evaluated with funding through deposits, minimum capital requirements affect the profitability of banks and their international competitiveness. So, regulators tried to level the playing field of international banks by harmonizing minimum capital requirements (Stolz, 2007). The main reason for banks to have capital adequacy is if bank owners have more capital at risk, enlarge that they would benefit from risk business, would be compensated by the potential loss of their capital if their bank were to practice high losses (Mekonen&Melesse, 2014).

2.1.2. Asset Quality

According to Yonas&Hamdu& W/ Michael (2015), Experience of credit risk, trends of nonperforming loans, and bank borrower effectiveness strength, will decide the health of the asset quality of the bank. The quality of assets held by an individual bank has a force on the performance and health of the bank.

Javaid&Alalawi (2018) Stated that controlling and assessing asset quality indicators is significant since risks to the solvency of financial institutions often arise from the impairment of assets. Asset quality is subject to the quality of credit evaluation, monitoring and collection within each bank, and could be enhanced by collateralizing the loans, having adequate provisions against potential losses, or avoiding assets put in one place in one geographical or economic sector.

National Bank of Ethiopia monitor the quality of its credit portfolio, ensure that timely and adequate provision is made, and loans are frequently reviewed and prudently classified in a manner that appropriately reflects credit risk (NBE,2012).

2.1.3. Reserve Requirement

According to Casu, Girardone& Molyneux (2006), Banks need to maintain many reserve assets for prudential reasons. If a bank falls to its minimum desired stage of reserve assets, it will have to turn away requests for loans or seek to acquire additional reserve assets from which to enlarge its lending. The outcome, in either case, will generally be a decrease in the demand for loans when rising in interest rates. Reserve requirement is one of the important monetary policy tools and prudential regulation tools, which forces banks to preserve the proportion of their deposit balance with the National bank of Ethiopia (NBE, 2013). Reserve requirements identify the amount of funds an institution must maintain against precise deposits (Cargill, 2017).

By varying the fraction of deposits that banks are forced to keep as reserve, the central bank can manage the money supply. This fraction is expressed in percentage terms and thus is called the required reserve ratio. The higher the required reserve ratio, the lower the amount of funds available to the banks, an increase in reserve requirements. It affects banks' ability to make loans and reduces potential bank profits because the central bank pays no interest on reserves (Casu, Girardone&Molyneux, 2006).

2.1.4. Liquidity Requirement

Liquidity Requirement is essential to preserve public trust and confidence by ensuring that banks have a sufficient level of liquidity at all times. There is a need to preserve liquidity requirements consistent with the reserve requirement of banks; it is necessary to ensure that banks correctly manage their liquidity (NBE, 2004).

Casu, Girardone&Molyneux (2006) stated that liquidity risk is created in the balance sheet by a mismatch between the size and maturity of assets and liabilities. It is the risk that the bank is maintaining insufficient liquid assets on its balance sheet and thus is incapable to meet requirements without impairment to its financial or reputational. A key risk for banks in liquidity transformation is liquidity risk because of their heavy dependence on short-term funding. Depositors want to remain liquid and may withdraw their cash without warning, whereas borrowers favor long-term funding (Dill, 2020).

If a bank is incapable to meet its liquidity requirements it will first attempt to obtain support through the lender-of-last-resort facility by borrowing from the central bank. However, if this option is not available, then the bank will have to consider bearing the losses from its capital resources. Therefore, reducing the bank's capital position, (Casu, Girardone&Molyneux, 2006). Credit risk relates to the other side of the coin of banks' function in liquidity transformation (Dill, 2020).

2.1.5. Return on Asset

According to Javaid&Alalawi (2018), ROA shows the capability of management to get deposits at a fair cost and invest them in profitable investments. This ratio displays how much net income makes per dollar of assets. The higher the ROA means the more profitable the banks. The deposit has a significant and positive impact on overall banking performance measured by ROA (Ferrouhi, 2017).

Return on Assets (ROA) is the measurement of profit ratios. In the examination of financial statements, this ratio is most often emphasized, because it can show company achievement to create profits. ROA can measure the company's ability to generate profits in the past to then be predictable in the future. Assets are used for general company properties, obtained from the capital itself or from foreign capital that has been transformed into company assets used for corporate sustainability (Rosikah et al, 2018).

2.2 Theory of Bank Regulation

2.2.1. Why Regulate Banks

According to ping (2014), Private interest and public interest theories of regulations are designed to clarify why regulation is done? Banks are the purpose for-profit and bankers are free to make many decisions in their daily operations, banking is commonly cared for as a matter of public interest. As per Spong(2000)banking laws and regulations expand too many aspects of banking, including who can open banks, what products can be offered, and how banks can expand.

Banking regulation refers to the part of the enforceable rules, arranged by regulatory authorities, which administer the activities of banks, on the other way banking regulation is concerned with a banking regulator's interference, unintended or intentional, with the activities of individual banks, to achieve the purposes of legislation and policies (Ping, 2014).

Spong(2000) defines Bank regulation has included serving numerous objectives which have changed over time and on occasion even conflicted with one another. The following sections focus on several of the more commonly accepted objectives of bank regulation. Also, because of the potential for conflict among regulatory objectives, particular attention is given to what banking regulation should not do.

As per Cargill (2017) regulation and supervision are focused on the direction of creating equal competition in the financial system, through a wide choice of regulations on the part of the Federal Reserve and other agencies to adjust entry and exit, competitive performance, etc. The government enforces widespread regulations on the structure and performance of the financial system.

Cargill (2017) argue that regulatory and supervisory authority by the government covers an extensive variety of roles fundamentally planned to bound risk-taking by individual depository institutions and sustain public confidence in depositing money.

Banking poses various unique problems for customers and creditors. First, various bank customers use a bank primarily when writing and cashing checks and carrying out other financial transactions. So, they must maintain a deposit account. As a result, bank customers assume the purpose of bank creditors and become associated with the prosperities of their bank. This is the difference from most other businesses, where customers only pay for goods or services and never become creditors of the firm (Spong, 2000).

These objectives can be accomplished by regulation and supervision, to limit imprudent lending by depository institutions; ensure that an adequate level of reserves and capital is maintained; monitor the operations of depository institutions through frequent reporting requirements on asset and liability operations; monitor operations of depository institutions via on-site examinations; and provide deposit insurance backed by the full faith and credit of the government (Cargill, 2017).

2.2.2. Regulation and Financial Stability

According to Spong (2000), banking regulation must seek to give a stable framework for making payments. With the huge volume of transactions behavior, every day by individuals and businesses, a safe and acceptable means of payment is serious to the strength of our economy.

As per Cargill (2017) during the beginning, central banks were planned to just ensure a stable monetary growth to keep price stability, provide lender of last resort facilities on occasion and deliver other services to create a national payments system.

Bikker&Bos (2008) argue that the banking operations of various banks are fairly similar, financial pressure emerging in one bank may point out similar difficulties in others. In many cases, it is difficult to differentiate bank-specific shocks from general shocks. Thus, a run on one bank may produce runs on other banks, bringing about serious financial instability. Central banks in the beginning started to conduct activist policies to offset shocks to the economy by conducting countercyclical monetary policy (Cargill, 2017).

As per Spong (2000) it is hard to envision how a multifaceted economic system could function and avoid serious disturbances if the multitude of daily transactions could not be finished with a high degree of certainty and safety. Bank regulation should thus preserve variations in business activity and problems at individual banks from unsettled the flow of transactions across the economy and threatening public confidence in the banking system.

2.3. Types of Regulations

2.3.1. Systemic Regulations

According to Casu, Girardone&Molyneux (2006), all public policy regulations are planned to minimize the risk of bank runs that goes under the name of the government safety net. Precisely,

this safety net includes two main features: deposit insurance arrangements and the lender of last resort function.

Ping (2014) stated that systemic regulations define as regulations that depend mostly on the safety and soundness of the financial system. Casu, Girardone&Molyneux (2006) Matching with the concept that banks are special, systemic regulation is primarily dependent on the inherent risk of systemic failure for the total economy.

2.3.1.1 Deposit insurance

As per Bonn (2005) deposit insurance is called the guarantee that all or part of a depositor's debt with a bank will be honoured in the event of bankruptcy. The definite form of insurance structures can fluctuate in a number of behaviours, including the fee structure (flat fee against variable, risk related payments); the degree of exposure (full against partial coverage, maximum limits); funding provisions (funded versus unfunded systems); private versus public solutions; compulsory versus voluntary participation. Bikker&Bos(2008) argue that government deposit insurance is planned to ensure public confidence in deposit money in order to put off contagion. (Cargill, 2017) deposit insurance creates risk shifting from the bank's deposit holders to all other banks or taxpayers.

The outcome of deposit insurance on the incentives of the bank depends upon the nature of the insurance contract (and also on any other complementary regulatory measures). In specific, the consequence of the deposit insurance on the bank will depend on whether or not the insurance premium paid by the bank is determined by the individual bank's risk (Bonn, 2005).

Casu, Girardone&Molyneux (2006) define deposit Insurance as an assurance that all or portion of the amount deposited by savers in a bank will be paid in the happening that a bank fails. The guarantee may be either clearly known in law or regulation, obtainable privately without government support or maybe incidental implicitly from the verbal promises and or past events of the authorities.

According to Ping (2014), Deposit insurance stands for a financial safety net commonly used by governments to preserve depositors' confidence in the event of financial instability and thus avoid bank runs.

2.3.2 The lender of last resort (LOLR)

As per Bonn (2005) lender of last resort involvements should be strictly limited to illiquid banks, easing only very temporary liquidity problems faced by banks (Emergency Liquidity Assistance), not extending also to help insolvent banks. Whenever the lender of last resort assists insolvent banks, its intervention has the same result of flat-rate unfunded deposit insurance, giving banks a strong incentive to adopt a riskier position than otherwise. By way of deposit insurance, when such encouragements extend across the financial system, the macroeconomic consequences can be severe.

According to Casu, Girardone&Molyneux (2006), the lender of last resort function is one of the main roles of a central bank. The central bank, or other central institution, will give funds to banks that are financial complexity and are not capable to access any other credit guide.

The central bank is responsible for monetary control and lender of last resort services, but there is no innate reason why central banks should play a major role in financial regulation and supervision (Cargill, 2017).

According to Cargill (2017), The reason central banks are most often allocated the responsibility of monetary regulator and lender of last resort is that in a modem reversed pyramid monetary system, the central bank controls the reserve base. Managing the reserve base permits the central bank to function as a lender of last resort and deliver general control of the money supply. The lender of last resort purpose was designed to limit infectivity among depository institutions, and in this regard, the central bank was more passive than activist, but now central banks have been allocating accountability for monitoring and responding to risk.

2.3.3. Prudential Regulation

As per Ping (2014) prudential regulation depends on the quality of individual banks' systems for identifying, measuring, and managing the various risks in their business operations. Prudential regulation is mainly function with consumer protection. It attaches to the monitoring and supervision of financial institutions, with specific care paid to asset quality and capital adequacy (Casu, Girardone&Molyneux, 2006).The dominant theories on prudential regulation concerned with restricting banks capital structure and portfolio allocations (Bikker&Bos, 2008).

According to Casu, Girardone&Molyneux (2006), prudential regulation concerned with that consumers are not in a position to judge the safety and soundness of financial institutions

because of defective consumer information and agency difficulties connected with the nature of the intermediation business.

2.3.4. Conduct of business regulation

According to Wellerdt(2015), The banking regulation creates a regulatory structure for the trust in transactions, in financial markets and reduces information asymmetries between banks as providers and private persons as demanders. Banking regulation is a multipurpose state instrument to impact the development of a main economic sector.

Depending on how banks and other financial institutions behave in their business; Conduct of business regulation relates to information revelation, fair business practices, competence, honesty and integrity of financial institutions, and their employees (Casu, Girardone&Molyneux, 2006). Conduct of business regulation focuses on bank business practice in relative to consumers. Such regulation ensures consumers possess appropriate information and that banks comply with suitable industry practices (Ping, 2014).

2.4 Empirical Literature

2.4.1. Studies in Global context

Triki, et.al (2016) asses Bank regulation and efficiency: What works for Africa? Results show strong variations in the relationship between regulation and bank efficiency in Africa, and these variations are very often pressured by the risk level and size of banks. They find that the efficiency of large African banks improved with stiffer restrictions on entry whereas the efficiency of smaller banks is delayed by tighter restrictions on exit. Similarly, high-risk banks advantage from increased restrictions on entry whereas low-risk banks do not get an advantage from increased restrictions on exit. And also found that more stringent capital requirements only improve the efficiency of large banks and low-risk banks.

Yang & Lee (2019) Studies Role of Bank Regulation on Bank Performance indication from Asia-Pacific Commercial Banks found that capital requirement improves bank performance, identified the positive relationship between regulation, supervision, and bank efficiency, especially in small-sized banks. Smaller banks benefit more from harsher policies; regulatory authorities could relax the requirements for medium and large-sized banks to exploit operational efficiency.

Chortareasa &Ventouric (2012) studies bank supervision, regulation, and efficiency: Evidence from the European Union. The results indicate that, when significant, capital requirements and more influential supervisors increase bank efficiency. And restricting banks from engaging in security activities is strongly associated with lower bank efficiency and performance. Bank size appears to be an important factor that forces the differences in efficiency across banks, which is documented by a negative and statistically significant sign for the Logarithm of Total Asset coefficient. They found that larger banks operating in countries with less concentrated and more developed systems be liable to have relatively higher levels of efficiency.

Muriuki, et.al (2019) Assess the consequence of Bank Specific Factors on Financial Performance of Commercial Banks in Kenya found that capital adequacy, management efficiency, and liquidity management variables did not significantly affect the financial performance of commercial banks. Comparatively, asset quality and risk management significantly affect the financial performance of listed commercial banks in Kenya.

Javaid & Alalawi (2018) Studied Performance and Profitability of Islamic Banks in Saudi Arabia: An Empirical Analysis found that Asset quality which is expressed as the provision of nonperforming loans to total loans is positively associated with the bank performance. This specifies that good asset quality is important for better bank performance. And the coefficient of the capital adequacy ratio is positive and highly significant, with both measures of profitability, reflecting the sound financial condition of Saudi banks. Management quality (is significantly positively connected to both performance ratios (ROA and ROE). They found that inflation is negatively related to profitability.

Barth, et.al, (2013) Studied based on an analysis of 4050 banks observations in 72 countries over the period 1999–2007, they discover that tighter restrictions on bank activities are negatively related to bank efficiency, though superior capital regulation strictness is slightly and positively related with bank efficiency. They also found that an increase in official supervisory power is positively associated with bank efficiency only in countries with independent supervisory authorities. Moreover, independence coupled with a more experienced supervisory authority tends to improve bank efficiency. Lastly, market-based monitoring of banks in terms of more financial simplicity is positively associated with bank efficiency.

Abidi & Lodhi (2015) the study examines the relationship between Reserve Requirement Ratio and Banks Profitability in Pakistan for the period 2005-2014. It emphasizes the effect of changes

in reserve requirement on commercial banking profitability and how it affects the ROE and ROA. The finding of the study is that Reserve Requirement has a significant inverse relationship with banks' financial performance, which is measured by ROE and ROA.

Klomp &Haan (2011) Examine Banking risk and regulation by collected data from 21 OECD countries for more than 200 banks for the period covered 2002 to 2008; the effect of bank supervision and regulation on banking risk is not synonyms. The results suggest that regulation and supervision do not have many results on low-risk banks, while most of their measures for the various bank size regulation and supervision the effect significant are high on highly risk banks. Moreover, the sensitivity analysis proposes that the effect of bank regulation and supervision also depends on the possession structure and the size of a bank.

2.4.2. Studies in Local Context

A study conducted by (Shimels, 2016) to investigate the impact of NBE directives and regulation on financial performance of private commercial banks in Ethiopia found that Purchasing the NBE bill had a negative and significant impact on the profitability of private commercial banks in Ethiopia, in addition to this capital Adequacy had also a negative and statistically significant impact on the liquidity of private banks in Ethiopia.

According to (Elias, 2022) found that reserve requirements had a negative and significant effect on the performance of private commercial banks in Ethiopia. Liquidity requirements had a negative and insignificant effect, while asset quality had a negative and statistically insignificant effect on bank performance. Minimum capital requirements had a positive and statistically significant impact on the financial performance of private commercial banks in Ethiopia.

The findings of the research study indicate by (Meron, 2017) that regulatory actions taken by the National Bank of Ethiopia have an impact on the profitability of six private commercial banks in Ethiopia. The study analysed three regulatory variables affecting bank performance using panel data from 2001 to 2014. The results showed that most of the regulatory variables were statistically significant, and the models fulfilled the assumptions of the classical linear regression model. Fixed effect models were used for analysis, and the study concluded that regulatory actions have a positive impact on the banking industry.

A study done by (Yusuf & Anwar) legal reserve requirements, capital adequacy, and inflation had a positive and significant impact on the performance of selected commercial banks in Ethiopia.

The study findings by (Tesfaye, 2018) suggest that regulatory factors, including exchange rates, interest rates, reserve requirements, and entry capital, significantly influence bank performance in the Ethiopian banking sector. Specifically, the exchange rate was found to have a positive and statistically significant relationship with profit models, indicating the importance of regulatory variables in shaping bank performances.

Prudential regulations have a positive effect on banks' performance post-global crisis, particularly through bank capital regulation. This is supported by the objective of prudential regulation to strengthen banks internally and increase profitability. However, there are conflicting views on the impact of bank regulations, with some studies suggesting negative effects due to greater fee requirements and corruption (Simeneh, 2020).

2.5 Conceptual Framework of the Study

There is an existing gap in the literature regarding the clear-cut impact of bank regulation on the banking industry and the overall economy. Additionally most of previously conducted study lies in the limited scope of examining only a few regulatory requirement variables on banks' financial performance, potentially overlooking other crucial factors that could influence the outcomes.

Therefore the conceptual framework of this study was illustrated the interrelationship between independent variables (Reserve requirement, Asset quality, capital adequacy requirement, Liquidity requirement, legal reserve, income diversification bank size and Market concentration) and the dependent variable (private commercial bank financial performance measured by Return on assets(ROA).

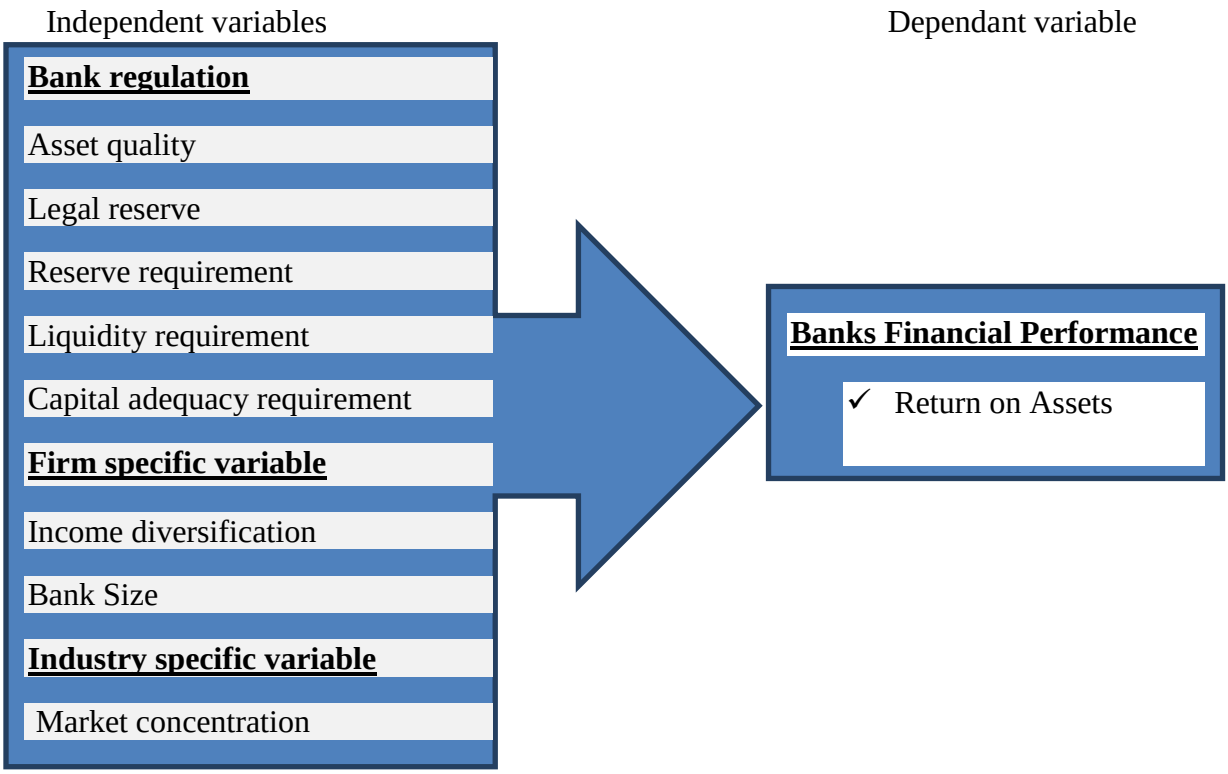

Figure 1: Conceptual Frame work

Source: Own literature review and Elias, 2022.

Chapter Three

Research Methodology

3.1. Research approach

For successful achievement of the objective of this study, quantitative research approach was used. Quantitative research approach was used to test the objective theories by examining the relationship among variables (Creswell, 2009). This research approach gives good emphasis to objectivity and is especially appropriate when there is the possibility of collecting quantifiable measures of variables and inferences from samples of a population as well as it adopts structured procedures and formal instruments for data collection (Queirós, Faria & Almeida 2017).

3.2. Research Design

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

3. 3. Population and sampling technique

For the purpose of this study the target populations were all private Banks registered by NBE and under operation in the country currently. Currently, the country has twenty-nine (29) private commercial banks which are operating throughout the country. But due to lack of five years data that is required for the analysis function in most of the newly established private banks (see in appendix I); the researcher is forced to reduce the sample size to sixteen (16) banks through applying purposive sampling technique. The researcher believed that the sample size is representative as it covers more than fifty percent of the total population.i

3.4. Types and Sources of Data Collection

In this study secondary data was used for successful achievement of the study. Secondary data refers to the information gathered from the source that already exist (Sekaram & Bougie, 2010). In order to investigate the effect of bank specific factors and financial regulatory related data was collected from banks financial statement and NBE directives.

3.5 Research variables and measurements

3.5.1 Dependent variable: Bank financial performance

- **Return on Assets (ROA)** = Return on Assets (ROA) is a financial metric that measures a company's profitability by evaluating its ability to generate earnings from its assets. It is calculated by dividing net income by total assets and is expressed as a percentage. ROA indicates how the banks efficiently is using its assets to generate profit and is a key ratio used to assess a bank's financial performance and management effectiveness.

3.5.2 Independent Variables

- **Asset quality (AQ)** = Asset quality refers to the health and risk associated with a bank's assets, particularly the loans and investments it holds. It reflects the likelihood that the assets, especially loans, will be paid back in full and on time. High asset quality indicates low risk of default, while poor asset quality suggests a higher risk of losses due to non-performing loans or investments.
- **Legal reserve requirement (LGR)** = Legal reserve requirement refers to the portion of a bank's profit that is required to be held in reserve by the central bank or regulatory authorities. As per Directive No. SBB/4/95, Every Ethiopian Bank shall transfer annually 25% of its annual net profit to its Legal Reserve Account until such account equals its capital. When the legal reserve account equals the capital of the bank, the amount to be transferred to the legal reserve account shall be 10% of the annual net profit.
- **Reserve requirement (RR)** = The reserve requirement is the amount of funds that banks are required to hold a portion of deposit collected from customers in reserve with the National Bank of Ethiopia. According to Directive No SBB/84/20220/ Sub article 3.1, a bank

operating in Ethiopia shall maintain in its reserve account of this directive 7% on average in every calendar month of all Birr and foreign currency deposit liabilities held for demand /current, saving and time deposit.

- Liquidity requirement (LR) = Liquidity requirement is the minimum amount of liquid assets that a bank must hold to meet its short-term obligations and manage potential cash flow needs. It ensures that banks have enough readily available funds to cover withdrawals by depositors and other short-term liabilities. As stated in Directives No. SBB/57/2014, sub article 4.3 any licensed commercial bank shall maintain liquid assets of not less than fifteen percent (15%) of its net current liabilities.
- **Capital adequacy requirement (CR)** = Capital requirement refers to minimum ration of capital that a bank must hold to ensure that it can absorb unexpected losses and remain solvent. The national bank of Ethiopia which is the mayor of the banking sector set capital adequacy of the banking sector to be at minimum 8%. It acts as a buffer against financial risks and helps protect depositors and creditors.
- **Firm specific variable**
  - **Income diversification (ID)** = Income diversification refers to the strategy of generating revenue from a variety of sources beyond traditional interest income, such as fees, commissions, and other non-interest income. It involves expanding the sources of income to reduce reliance on a single revenue stream, thereby increasing financial stability and profitability. Income diversification can help banks mitigate risks, enhance returns, and adapt to changing market conditions by broadening their revenue base. It measures the extent to which a bank diversifies its income sources to reduce risk.
  - **Bank size (BSZ)=** Bank size refers to the total assets or capital base of a bank, typically measured in terms of total deposits, loans, and investments held by the bank. It is an indicator of the scale and scope of operations of a bank, reflecting its market presence, financial strength, and capacity to serve customers. Larger banks often benefit from economies of scale, greater market power, and potentially higher profitability compared to smaller banks. It represents the size of the bank in terms of assets, operations, or market share

- **Industry specific variable**
  - ✓ **Market concentration (MKTCN)**: Measures the extent to which market shares are concentrated between a small numbers of Large Banks. It is often taken as a proxy for the intensity of competition.

Table 1: Variables measurement

Independent variables	Measurement	Expected sign
Asset Quality (AQ)	Provision to total assets ratio	+
Legal Reserve Requirement- (LGR)	Log of legal reserve	-
Reserve Requirement (RR)	Log of General & special reserves	-
Liquidity Requirement (LQ	Ratio of current asset to current liability	-
Capital Adequacy Requirement (CAD)	Ratio of Bank capital to Risk weighted asset	+
Income Diversification (ID)	Ratio of non-interest income to total income	+
Bank Size (BSZ)=	Log of total assets	+
Market Concentration (MKTCN):	The Ratio of the top five large banks total asset to the total asset of the industry	-

Source: Developed by the Researcher

3.6. Data Analysis Techniques and Tools

After collecting the data, it was analyzed to achieve the study's objective. The data has a time series and cross-sectional nature, so panel data analysis was used to get better results. The researcher employed an econometrics model because the study was used data from sixteen commercial banks over a five-year period. Additionally, panel data econometrics model allows identifying effects that are not detectable in pure cross-sections or pure time-series studies (Tornyeva, 2013). Descriptive statistics such as mean, minimum, maximum, and standard deviation values was used to analyze the general trends of the data. To process the data, the study was used STATA Version 16 software package as a data processing tool.

3.7. Model Specification

The panel regression equation differs from a regular time-series or cross section regression by the double subscript attached to each variable (Tornyeva, 2013). The general form of the panel

data model can be specified as follows that is adopted from (Amdemikael, 2012) and (Fentaw, 2015) with slight modification to be suited with the objective of this study.

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

Y_{it} is the dependent variable, which is the profitability bank i at time t, with i=1… N, t=1… T, βo is a constant term; ***Xit*** is the independent variables in the estimation model over the time t for bank i with the error term $U_{it.}$.

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

$ROA_{it} = \mathcal{B}_{0+} B_1 CAD_{it} + \mathcal{B}2\ LQ_{it+} \mathcal{B}_3 AQ_{it} + \mathcal{B}_4 LGRit + \mathcal{B}_5 RR_{it} + \mathcal{B}6\ LGR_{it} + B7ID_{it} + \mathcal{B}_8\ BSZ_{it} + \mathcal{B}_9 MKTCN_{it} + U_{it}$

Where:

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

CAD_{it} = Capital adequacy requirement for Bank i over the time t

LQ_{it} = Liquidity requirent for Bank i over the time t

AQ_{it} = Asset Quality of Bank i over the time t

LGRit = Legal Researve requirement for Bank i over the time t

RR_{it} = Researve requirement for Bank i over the time t

ID_{it} = Income diversification of Bank i over the time t

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

$MKTCN_{it}$ = Market Concentration the industry for bank i over time t

U_{it} = the error term

$\mathcal{B}_0$ = Coefficient of the constant

$\mathcal{B}_{1\ldots9}$ = Coefficient of the Independent variables

Chapter Four

Results and Discussion

4.1 introductions

In this chapter the data collected through documentary analysis of financial statement of Ethiopian private banks obtained from National Bank of Ethiopia and banks published annual financial report is analyzed and discussed. This chapter incorporates the test result for the classical linear regression model assumptions, descriptive statistics, and the regression result of the study. Finally it presents the detail discussion of regression result.

4.2. Descriptive statistics analysis

The descriptive statistics for the dependent and independent variables are presented below. The dependent variable is Return on Assets (RoA), measured by the ratio of net income after tax to average total assets. The independent variables include asset quality, legal reserve, reserve requirement, liquidity requirement, income diversification, and market concentration. Due to correlation problem Bank size was dropped from the regression model and descriptive statistics.

Table 2: Descriptive statistics of variables

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	80	.0257146	.0079243	.0033	.0493
CAD	80	.1779475	.0650127	.0928	.37
LQ	80	.2093275	.0704902	.1059	.4047
AQ	80	.0066225	.0057162	.0003	.0316
LGR	80	2.67576	.799429	.0017	3.71
RR	80	2.11239	.6698805	0	3.43
ID	80	.3251288	.1596156	.0118	.6795
MKTCON	80	.5914176	.0320612	.5216257	.6427925

Source *Researcher's own computation through STATA13 banks financial statements*

The above table 2 shows that the mean, maximum, minimum, and standard deviation values of the dependent and independent variables for the sampled private commercial banks. As resented

in the table, banks have been earning a Return on Assets (ROA) with a mean value of 2.57%, a maximum of 4.93%, and a minimum of 0.33%. This means that some of the most profitable private commercial banks in Ethiopia earned 4.93 cents from a one birr investment in their assets, while the least profitable banks earned 0.33 cents from each birr investment in their assets. The rest of the banks earned between 0.33 cents to 4.93 cents. Furthermore, the standard deviation showed 0.79%, indicating variation in ROA from the mean value by 0.79 cents. This indicates the presence of wide variation the financial performance between Ethiopian commercial banks.

As per the result of the study, Ethiopian private commercial banks have a good capital adequacy level with an average capital adequacy ratio (CAD) ratio of 17.80%, which exceeded the minimum regulatory requirement of 8% under directive No. SBB/50/2011 and also recommended by the Basel framework. The standard deviation of CAD at 6.50% indicated that the dispersion of values ranged from a minimum of to a maximum of 37.00% from the mean. This means, that some banks have utilized their capital and reached at (9.28% capital adequacy ratio, while others have more capital buffers of 37% of their risk-sensitive assets to use as a hedge against risk, ensure financial stability, and regulatory compliance. A study by Javaid & Alalawi (2018) found a positive association between the capital adequacy ratio and bank performance in Saudi Arabia, emphasizing the importance of sound financial conditions for banks. This study underscores the importance of maintaining an optimal capital adequacy ratio in the banking sector's financial performance.

On the other hand the mean value of LQ requirement was 21.09% which also above the minimum requirement by NBE (15%) with a maximum value of 40.98% and a minimum value of 10.59 % leads to have a standard deviation of 7.04 % from the mean. This implies that there are some commercial banks which have a liquidity requirement status by NBE far below the standard (15%).Furthermore the result indicating there was high variability in liquidity requirements across the banks. A higher LQ suggests that banks have sufficient liquid assets to meet short-term obligations, enhancing their ability to withstand financial shocks and maintain stability. Similarly to this Berger & Bouwman (2013) highlighted the relationship between liquidity levels and bank stability, suggesting that adequate liquidity reserves are essential for banks to navigate uncertain market conditions. These studies underscore the critical role of

liquidity requirements in safeguarding banks against liquidity crises and supporting their overall financial health.

The variable Asset quality was measured by dividing the bank provision balance with total asset during each fiscal year and shows a mean value of (0.66%), maximum value of (3.16%) and minimum value of (0.03 %) and a standard deviation of 0.57 %. The standard deviation for AQ is 0.57%, indicating the dispersion of asset quality levels across the banks. Higher asset quality ratios (loan loss provision to total assets) suggest that banks have risky credit portfolios, higher nonperforming loans because of higher loan loss, and week risk management practices, which can lead to poor financial performance and overall stability.

Supporting this finding, Melesse (2014) emphasized the importance of controlling and assessing asset quality indicators to mitigate risks to financial institutions' solvency. Additionally, Javaid & Alalawi (2018) found a positive association between asset quality and bank performance, highlighting the significance of good asset quality for better financial outcomes. Therefore maintaining high asset quality is crucial for enhancing bank performance and mitigating risks.

Another independent variable legal reserve requirement (LGR) measured by natural logarithm of banks Million Birr legal reserve, indicate a mean value of 2.68 was required by NBE from private commercial banks as a legal reserve and range from maximum of 3.71 to minimum of 0.17.The standard deviation for LGR is 0.80, showing the dispersion of legal reserve requirements around the mean. Meeting the LGR set by the central bank is crucial for banks to ensure financial stability, regulatory compliance, and maintain public trust in the banking system. Supporting this finding, Demirgüç-Kunt & Detragiache (2011) highlighted the significance of reserve requirements in enhancing financial stability and controlling excessive risk-taking by banks. Additionally, Claessens et al. (2018) emphasized the role of legal reserve requirements in safeguarding the banking system against liquidity crises and ensuring banks maintain adequate reserves to meet depositor demands. Therefore achieving this legal reserve requirement by commercial banks will helpful in promoting financial stability and regulatory compliance within the banking sector.

While looking about required reserve (deposit reserve) which was also measured by taking natural logarithm of the banks Millions Birr of General & special reserves for each commercial banks, and show a mean value of 2.11 and range from maximum value of 3.43 to minimum value

of 0, with standard deviation of 0.67 from the mean value. The standard deviation for deposit reserve is 0.67, indicating the variability in reserve requirements across the banks. Maintaining the required deposit reserves is essential for banks to ensure liquidity, meet regulatory obligations, and support financial stability in the banking system. A study by Beck et al. (2014) highlighted the role of deposit reserves in influencing banks' lending behavior and liquidity management find that deposit reserves plays a crucial role in ensuring banks have sufficient liquidity to meet obligations and regulatory requirements, ultimately affecting their financial performance and stability.

Income diversification which was another independent variable and measured as a ratio of non-interest income to total income of each banks and that shows a mean value of 32.51% and which range from maximum value of 67.95% to the minimum value of 1.18% with a standard deviation of 15.96% from the mean value. The standard deviation for ID is 15.96%, indicating the variability in income diversification strategies across the banks. Higher income diversification levels suggest that banks are generating revenue from various sources beyond traditional interest income, which can enhance financial stability, profitability, and risk mitigation. Supporting this finding, Rahman (2015) highlighted the positive impact of income diversification on bank profitability, emphasizing the importance of reducing reliance on a single revenue stream. Additionally, Sanlisoy et al. (2017) found that income diversification can help banks adapt to changing market conditions and enhance returns, aligning with the notion that diversified income sources contribute to financial stability and performance. These studies underscore the significance of income diversification for banks in managing risks and improving financial outcomes.

Finally the Market concentration which was measured by the share of five largest banks to the industry total asset indicate a mean value of 59.14% market share ranging to the maximum and minimum market share of 52.16% and 64.28% respectively. The result indicates the presence of high concentration in Ethiopia financial sector. Out of total private banks total asset, more than 50 percent of the market share is hold by the largest five private five commercial banks, if t commercial bank of Ethiopia was included in the study, the concentration will increase by much percentage.

4.3 Inferential statistics

4.2.1. Test results for the classical linear regression model assumptions

In this section the researcher examines the most important assumptions of the linear regression-model homoscedasticity, no autocorrelation, no multicollinearity, and normality of the data in order to analyse the overall situations if these assumptions are not fulfilled.

4.2.1.1. Test for normality

A normal distribution is a perfectly symmetric, mound-shaped distribution. It is commonly referred to the as a normal, or bell curve. Because so many real data sets closely approximate a normal distribution. In practical data collection, the distribution will never be exactly symmetric (CK-12 Foundation, 2012).

4.2.1.2. Histogram Test

In this study, the researcher used a histogram to determine if the normality test was satisfied. According to Brooks (2008), if the residuals are normally distributed, the histogram should have a bell-shaped curve. Figure 2 demonstrates that the histogram indicates the residuals are normally distributed. Unfortunately, graphical representations like histogram provide no hard-and-fast rules and it shows normally distributed.

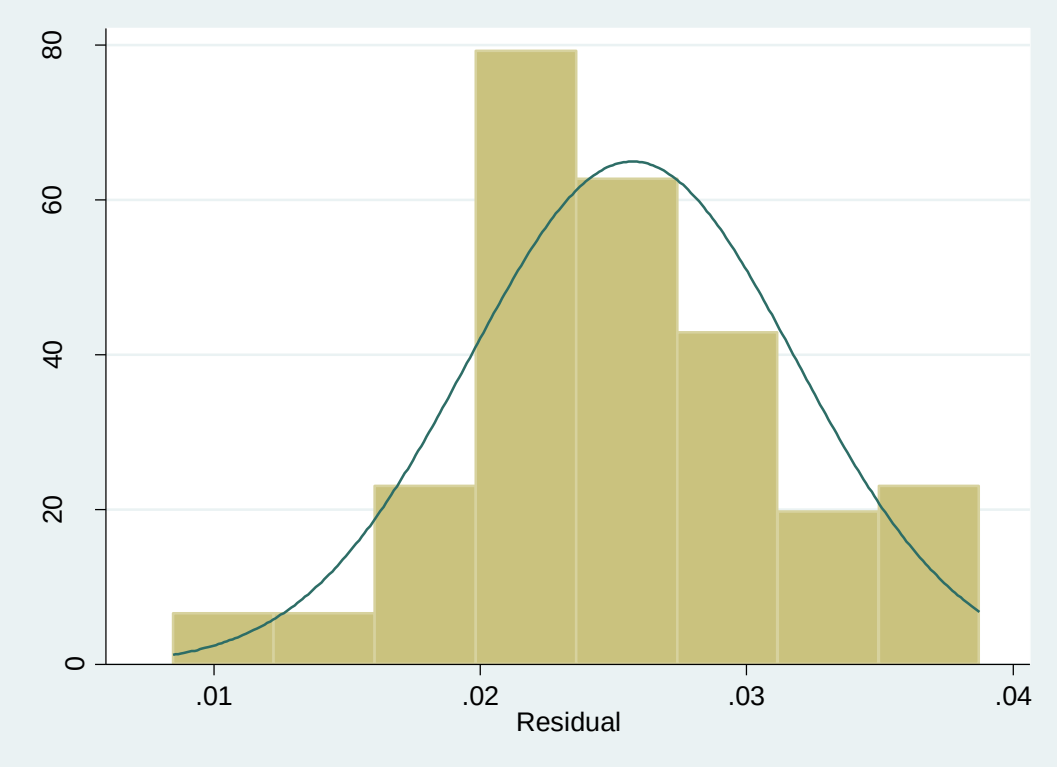

Figure 2: Normality test for ROA model

Source: Researcher's own computation through STATA13 based on financial statements of Banks

4.2.1.3. Skewness/Kurtosis Tests for Normality

The STATA results for the tests of Skewness/Kurtosis presented in figure 3 below indicates the P-value of 0.5427. Since the P-value is insignificant the researcher fails to reject the null hypothesis, so that the data is consistent with a normal distribution assumption.

```
. sktest myresiduals

                    Skewness/Kurtosis tests for Normality
                                                              ------ joint ------
    Variable |   Obs   Pr(Skewness)   Pr(Kurtosis)  adj chi2(2)     Prob>chi2
-------------+------------------------------------------------------------------
 myresiduals |    80        0.7195         0.3031         1.22          0.5427
```

Figure 3 Skewness/Kurtosis tests

Source: Researcher's own computation through STATA13 based on financial statements of Banks

4.2.1.4. Test of assumption of homoscedasticity

The other assumption of the classical linear regression model is that the variance of U_i for each X_i (i.e., the conditional variance of U_i) is some positive constant number equal to $\sigma 2$ (Gujarati, 2012). This is known as the assumption of homoscedasticity of equal speared (or equal variance) of the error terms. However if the distributions of U_i around the explanatory variables does not have a constant variance, we say that U_i's are heteroscedastic to mean that the variances of U_i is variable or not constant. In this study the presence of heteroscedasticity is checked through applying Breusch-Pagan / Cook-Weisberg test.

```
. estat hettest CAD LQ AQ LGR RR ID MKTCON

Breusch-Pagan / Cook-
       Weisberg test for
       heteroskedasticit
       y Ho: Constant
       variance
       Variables: CAD LQ AQ LGR RR ID MKTCON

       chi2(7)    =  17.18
       Prob > chi2   = 0.0163
```

Figure 4: Breusch-Pagan / Cook-Weisberg test for heteroscedasticity

Source: Researcher's own computation through STATA13 based on financial statements of Banks

The result in figure 4 above shows the insignificance (P-value is 0.0163) and the researcher reject the null hypothesis of constant variance, which means there is heteroscedasticity detection. So, the problem of heteroscedasticity shall be fixed by robust regression.

4.2.1.5. Test of Multicollinearity

Multicollinearity is a problem arises due to the presence of perfect linear relationship between explanatory variables. Thus, the correlation coefficient between two explanatory variables is one, which shows perfect correlation between them.

In practice neither of the two extreme cases (i.e., perfect co-linearity nor orthogonal) exist, rather there is some degree of inter correlation among explanatory variables. The correlation coefficient for each pair of explanatory variables will have a value between zero & one .Multicollinearity is inherent due to interdependency of many economic variables. So it is a question of degree but not of its existence.

Different authors forwarded different ideas about the cut- off point that will be used as a guideline to judge the presence of multicollinearity problem. According to (Hair, Black, Babin, Anderson & Tatham, 2006) correlation coefficient below 0.9 may not cause multicollinearity problem. On the other hand, Kennedy, (2008) states the correlation coefficient between explanatory variables of above 0.7 could cause a serious multicollinearity problem that leads to inefficient estimation and less reliable ordinary least square regression result.

As shown in table: 3 below in this study the maximum correlation coefficient between independent variables are 0.7975 (between bank size (BSZ and reserve requirement (RR), and 0.7535 (between bank size (BSZ and Income diversification (ID), which are below 0.7. Therefore the study will exclude BSZ form the regression.

Table 3: Correlation matrixes of independent variables

```
. corr CAD LQ AQ LGR RR BSZ ID MKTCON
  (obs=80)
```

	CAD	LQ	AQ	LGR	RR	BSZ	ID	MKTCON
CAD	1.0000							
LQ	0.2889	1.0000						
AQ	-0.3092	-0.1483	1.0000					
LGR	-0.2698	-0.0594	0.1132	1.0000				
RR	-0.4153	-0.3721	0.3041	0.6569	1.0000			
BSZ	-0.5831	-0.4701	0.3763	0.5396	0.7975	1.0000		
ID	0.6320	0.4842	-0.4159	-0.4429	-0.6394	-0.7535	1.0000	
MKTCON	-0.1924	-0.1485	0.2295	0.1407	0.2895	0.3550	-0.1051	1.0000

Source: Researcher's own computation through STATA13 based on financial statements of Banks.

Test of Multicollinearity by VIF

Multicollinearity can also be tested by running VIF. According to Gujarati (2012), high multicollinearity is indicated when the variance-inflating factor (VIF) exceeds 10. The VIF

measures the inflation of regression coefficient variances compared to when determinants are not linearly related. In Table 4 below, the VIF value was 1.92, showing no detection of multicollinearity problem.

Table 4: VIF test for Multicollinearity

vif

Variable	VIF	1/VIF
ID	**3.00**	**0.332899**
RR	**2.75**	**0.363847**
LGR	**1.99**	**0.502669**
CAD	**1.72**	**0.581998**
LQ	**1.48**	**0.674156**
AQ	**1.31**	**0.763846**
MKTCON	**1.19**	**0.838249**
Mean VIF	**1.92**	

Source: Researcher's own computation through STATA13 based on financial statements of Banks.

4.2.1.6. Test of autocorrelation

The classical model assumes that the disturbance term relating to any observation is not influenced by the disturbance term relating to any other observation. As shown in table 6 below, the study used the Durbin Wtson test statistics to check the data is free of Autocorrelation.

Table 5: Autocorrelation test result

```
. dwstat
Durbin-Watson d-statistic(  8,    80) =  1.795346
```

Source: *Researcher's own computation through STATA13 based on financial statements of Banks.*

The Durbin-Watson test statistic is used to test the null hypothesis that the residuals from an ordinary least squares regression are not correlated with each other. The Durbin-Watson (DW) test statistic ranges in value from 0 to 4. A value approaching zero indicates positive autocorrelation, a value near 2 indicates no autocorrelation, and a value approaching 4 indicates negative autocorrelation.

In the regression output of this study, the DW statistic value is 1.795. Referring to the DW table, the critical values of dL and dU for 8 redressers (including a constant term) and 80 observations at a 1% significance level are 1.285 and 1.714, respectively. Therefore, the DW statistic of 1.795 is close to 2. Based on this result, the researcher failed to reject the null hypothesis, indicating no serial correlation. Consequently, the data does not exhibit autocorrelation.

4.2.2 Regression Analysis and Discussion of the Results

In this section, the researcher provides a detailed presentation and analysis of the robust regression results obtained from the random effects model.

4.2.2.1 Model Specification

The study utilized panel data collected from sixteen Ethiopian commercial banks from 2018 to 2022. For this dataset, either a random effect or fixed effect model can be applied. The decision between the fixed effect model and the random effect model is determined by conducting a formal test known as the Hausman test. The Hausman test is used to examine the null hypothesis that states the random effect is appropriate. The Hausman test is presented as follows:

Table 6: Hausman test result

hausman fe re

	Coefficients ——			
	(b) fe	(B) re	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
CAD	**.0359089**	**.0282148**	**.007694**	**.0146012**
LQ	**.0105461**	**-.012673**	**.0232191**	**.0091131**
AQ	**-.3901884**	**-.517175**	**.1269866**	**.1014036**
LGR	**.0232838**	**.0037878**	**.019496**	**.0065354**
RR	**-.002956**	**-.00078**	**-.002176**	**.0012119**
ID	**.0346119**	**.0242199**	**.0103919**	**.0063847**
MKTCON	**-.0513251**	**-.0011899**	**-.0501352**	**.0211979**

Prob>chi2 = **0.0630**

Source: *Researcher's own computation through STATA13 based on financial statements of Banks.*

As presented in Table 6 above, the Hausman test resulted in a p-value of 0.0630, which is greater than 0.05. Therefore, the researcher failed to reject the null hypothesis, indicating that the random effect is an appropriate model for the study.

4.2.2.2Presentation and Discussion of the Regression Results

The random effect robust regression result of the study is presented as follows

Table 7: Random Effect Estimates with Robust Standard Error

```
xtreg ROA CAD LQ AQ LGR RR ID MKTCON , re robust

Random-effects GLS regression                   Number of obs      =        80
Group variable: Bankcode                        Number of groups   =        16

R-sq:  within = 0.4096                          Obs per group: min =         5
       between = 0.8147                                        avg =       5.0
       overall = 0.5976                                        max =         5
                                                Wald chi2(7)       =    262.46
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000

                                    (Std. Err. adjusted for 16 clusters in Bankcode)
------------------------------------------------------------------------------
             |               Robust
         ROA |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         CAD |   .0282148   .0167671     1.68   0.092    -.004648    .0610777
          LQ |  -.012673    .0162361    -0.78   0.435    -.0444951   .0191491
          AQ |  -.517175    .139876     -3.70   0.000**  -.7913269  -.2430231
         LGR |   .0037878   .0014644     2.59   0.010**   .0009177   .006658
          RR |  -.00078     .0010365    -0.75   0.452    -.0028114   .0012515
          ID |   .0242199   .0078008     3.10   0.002**   .0089306   .0395093
      MKTCON |  -.0011899   .0226288    -0.05   0.958    -.0455416   .0431617
       _cons |   .0111131   .014447      0.77   0.442    -.0172026   .0394288
-------------+----------------------------------------------------------------
     sigma_u |  .0022327
     sigma_e |  .00474161
         rho |  .18148342   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

*** and * denotes significant level of variables at 1%, and 10% respectively*

Source: *Researcher's own computation through STATA13 based on financial statements of Banks.*

According to the results in Table 7 above, one regulatory variables legal reserve requirement) and two firm-specific variables (asset quality and income diversification) had statistically significant effects on the profitability of private commercial banks in Ethiopia.

The discussion of the study results below is organized based on independent variables that had a statistically significant impact on banks' profitability. The regression results were assessed in light of previous studies and available theoretical literature.

Asset Quality (AQ) and Bank Profitability (ROA)

Asset Quality (AQ) was measured as the Banks provision to total assets ratio and consequently the result to be interpreted in reverse: negative sign of the coefficient means positive impact on the dependent variable (ROA) conversely.

Based on this the regression result found that there is a statistically significant positive effect of Asset quality on the Banks financial performance (ROA), with a regression coefficient of -0.5177175 and at 1% level of confidence. This implies that as Asset quality increased by one unit keeping other variables would lead to the banks financial performance which is return on assets improved by 0.5177175 units and the reverse is true. In line with this finding, Melesse (2014) emphasized the importance of controlling and assessing asset quality indicators to mitigate risks to financial institutions' solvency. Additionally, Javaid & Alalawi (2018) found a positive association between asset quality and bank performance, highlighting the significance of good asset quality for better financial outcomes. These studies reinforce the idea that maintaining high asset quality is crucial for enhancing bank performance and mitigating risks.

Therefore Asset quality is crucial for bank's financial performance as it directly impacts their profitability and risk management. Higher asset quality, indicating lower levels of non-performing loans and higher creditworthiness of borrowers, can lead to improved financial performance by reducing credit risk and potential losses. Banks with better asset quality are likely to have higher returns on assets (ROA) and attract more investors, contributing positively to their overall financial health and stability.

Legal Reserve (LGR) and Bank Profitability (ROA)

Legal reserve which is measured by the natural log of total legal reserve of banks had a positive impact on the profitability of Ethiopian private commercial Banks. The variable is also statistically significant in (p-value = 0.010) at 1% significance level and with a beta coefficient of 0.0037878. The beta coefficient indicates that all other things being constant, as legal reserve of the bank increases in 1 Birr will leads to increase ROA of Ethiopian commercial banks by 0.00379 Birr and vice versa.

The main reason for this positive relationship would be the fact that the legal reserves increase the bank's capital base that may increase bank's confident to bear more risk and earn more return on their assets. This finding is consistent with the study result of Lealem (2021), but contradicted with other studies finding such as Offor (2023), Miyoba, and Haabazoka, (2024).

Income Diversification (ID) and Bank Profitability (ROA)

Income Diversification is the second firm specific explanatory variable employed in this study that is measure by the ratio of non-interest income to the total income. As presented in table: 7 above above the regression results show a positive and significant relationship between income diversification and ROA of banks. The positive beta coefficient income diversification 0.0242199 infers that one percent increase in none interest income will leads to 0.024 percentage growth in ROA of sampled commercial banks.

This may be because unlike interest income it has no direct contra expense. The increase in noninterest income may not necessarily cause additional marginal expenses. Because of increasing interest cost of funds, the Bank's net interest margin is diminishing and now banks are focusing on maximizing their profitability from non- interest income sources such as commission and service charges. The recent Commercial Bank of Ethiopia's implementation of new service charges on mobile banking and cash withdrawal at customer service windows are a good indicator for Ethiopian banks new focus on income diversification strategy. This find of the study is in line with the previous empirical studies such as Dessalegn (2024) and Amoah, *et al.* (2022) but contradicted with the finding of Kwaku *et. a.l.* (2023).

Chapter Five

Conclusion and Recommendation

5.1. Conclusion

From the descriptive results of the study provide valuable insights into the general trends and characteristics of the data collected from Ethiopian private banks. Through descriptive statistics such as mean, minimum, maximum, and standard deviation values, the study offers a comprehensive overview of the variables under investigation. These descriptive results lay the foundation for further analysis and interpretation of the data, contributing to a deeper understanding of the financial performance of private banks in Ethiopia.

Based on this the descriptive analysis of ROA reveals a mean value of 0.026174 with a standard deviation of 0.0084347, indicating the average return generated by the banks and the variability around this measure are high.

The descriptive results show a mean capital adequacy (CAD) of 0.177585 with a standard deviation of 0.0652347, reflecting the banks' capital adequacy levels and the dispersion of these ratios within the sample. The analysis indicates a mean LQ of 0.210681 with a standard deviation of 0.0763483, providing insights into the liquidity positions of the banks and the variability in their liquidity management. The descriptive analysis of AQ shows a mean value of 0.006525 with a standard deviation of 0.0063662, shedding light on the asset quality of the banks and the spread of asset quality metrics across the sample.

The results reveal a mean LGR of 2.675760 with a standard deviation of 0.7994290, indicating the average rate of legal reserve variability among the banks. The descriptive analysis shows a mean RR of 2.082390 with a standard deviation of 0.7343134, providing insights in the dispersion of required reserve within the sample.

Income Diversification (ID): The analysis indicates a mean ID of 0.325129 with a standard deviation of 0.1596156, offering insights into the income diversification strategies of the banks and the variability in income streams across the sample. Generally these descriptive results offer a comprehensive overview of key financial metrics, enabling a better understanding of the financial performance and risk profiles of private banks in Ethiopia

The inferential results of the study provide valuable insights into the relationships between regulatory variables and financial performance indicators of private commercial banks in Ethiopia. Through robust regression analysis, the study identifies significant associations between regulatory frameworks and key performance metric return on assets with capital adequacy ratio, asset quality, legal reserve and income diversification. These findings underscore the importance of effective banking regulations in influencing the operational and financial outcomes of private banks in Ethiopia, highlighting the need for strategic regulatory interventions to enhance financial stability and performance in the banking sector.

The regression analysis results also indicate a statistically significant positive effect of asset quality on bank financial performance (ROA). This suggests that maintaining high asset quality, with lower non-performing loans and strong risk management practices, is crucial for enhancing bank performance and mitigating risks. Therefore, it is essential for banks to control and assess asset quality indicators to safeguard their solvency and improve financial outcomes.

The regression analysis results show that Legal Reserve (LGR) has a positive impact on the profitability of Ethiopian private commercial banks, with a statistically significant relationship at a 1% significance level. An increase in legal reserves leads to a corresponding increase in Return on Assets (ROA), indicating that maintaining adequate legal reserves can enhance bank profitability and financial health. Therefore, meeting the legal reserve requirements set by regulatory authorities is crucial for ensuring financial stability, regulatory compliance, and public trust in the banking system.

Income Diversification (ID) has a positive and significant relationship with Return on Assets (ROA) of banks, as indicated by the regression results. A one percent increase in non-interest income leads to a 0.024 percentage growth in ROA for sampled commercial banks. This suggests that diversifying income sources beyond traditional interest income can enhance financial stability, profitability, and risk mitigation for banks.

5.2 Recommendations

By considering the study findings, the researcher made the following recommendations; for different stakeholder as follows:-

For Ethiopian private commercial banks: All Ethiopian private commercial banks should:-

- Focus in maintaining high asset quality by managing non-performing loans and implementing robust risk management practices to positively impact their financial performance.
- Ensure in meeting the legal reserve requirements set by regulatory authorities since it is crucial for enhancing financial stability, regulatory compliance, and public trust in the banking system.
- Focus on expanding their revenue streams beyond traditional interest income to enhance financial stability, profitability, and risk mitigation from non-interest income sources such as fees and service charges to counterbalance diminishing net interest margins.

For Policy Makers: NBE and other policy makers should:-

- Consider the significant influence of banking regulations on financial performance when formulating policies.
- Understanding the effects of policies on bank operations and profitability to make informed decisions during policy formulation and implementation.
- Enhance regulatory frameworks to align with the study findings, focusing on strategic interventions to improve financial stability and performance in the banking sector.

For Future Researchers: future researchers should

- Investigate the impact of additional variables such as income diversification.
- Conduct replication studies to validate existing findings and explore untouched areas to contribute further insights into the relationship between bank regulations and financial performance.
- Employ robust research methodologies, including quantitative approaches, to ensure accurate and reliable analysis of the effects of bank regulations on financial performance for future studies

Annex II: Descriptive statistics of variables

```
. sum ROA CAD LQ AQ LGR RR ID MKTCON
```

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	80	.0257146	.0079243	.0033	.0493
CAD	80	.1779475	.0650127	.0928	.37
LQ	80	.2093275	.0704902	.1059	.4047
AQ	80	.0066225	.0057162	.0003	.0316
LGR	80	2.67576	.799429	.0017	3.71
RR	80	2.11239	.6698805	0	3.43
ID	80	.3251288	.1596156	.0118	.6795
MKTCON	80	.5914176	.0320612	.5216257	.6427925

Annex III: Skewness/Kurtosis Tests for Normality

```
. sktest myresiduals
```

Skewness/Kurtosis tests for Normality

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	joint adj chi2(2)	joint Prob>chi2
myresiduals	80	0.7195	0.3031	1.22	0.5427

```
. sktest ROA
```

Skewness/Kurtosis tests for Normality

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	joint adj chi2(2)	joint Prob>chi2
ROA	80	0.4917	0.0184	5.76	0.0562

Annex IV: test of hetrosckedasticity

```
. estat hettest CAD LQ AQ LGR RR ID MKTCON

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: CAD LQ AQ LGR RR ID MKTCON

         chi2(7)      =    17.18
         Prob > chi2  =   0.0163
```

Annex

Annex V: Test of Multicollinearity

```
. cor CAD LQ AQ LGR RR BSZ ID MKTCON
(obs=80)
```

	CAD	LQ	AQ	LGR	RR	BSZ	ID	MKTCON
CAD	1.0000							
LQ	0.2889	1.0000						
AQ	-0.3092	-0.1483	1.0000					
LGR	-0.2698	-0.0594	0.1132	1.0000				
RR	-0.4153	-0.3721	0.3041	0.6569	1.0000			
BSZ	-0.5831	-0.4701	0.3763	0.5396	0.7975	1.0000		
ID	0.6320	0.4842	-0.4159	-0.4429	-0.6394	-0.7535	1.0000	
MKTCON	-0.1924	-0.1485	0.2295	0.1407	0.2895	0.3550	-0.1051	1.0000

```
. vif
```

Variable	VIF	1/VIF
ID	3.00	0.332899
RR	2.75	0.363847
LGR	1.99	0.502669
CAD	1.72	0.581998
LQ	1.48	0.674156
AQ	1.31	0.763846
MKTCON	1.19	0.838249
Mean VIF	1.92	

Annex VI: Test of autocorrelation

```
. reg ROA CAD LQ AQ LGR RR ID MKTCON
```

Source	SS	df	MS		
Model	.002977122	7	.000425303	Number of obs =	80
Residual	.001983638	72	.000027551	F(7, 72) =	15.44
				Prob > F =	0.0000
Total	.00496076	79	.000062794	R-squared =	0.6001
				Adj R-squared =	0.5613
				Root MSE =	.00525

ROA	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
CAD	.0277062	.0119067	2.33	0.023	.0039706	.0514418
LQ	-.017495	.0102033	-1.71	0.091	-.037835	.002845
AQ	-.5156953	.1182069	-4.36	0.000	-.7513365	-.2800542
LGR	.0035199	.0010419	3.38	0.001	.0014429	.005597
RR	-.0009162	.0014615	-0.63	0.533	-.0038296	.0019972
ID	.0227757	.0064124	3.55	0.001	.0099929	.0355586
MKTCON	-.0025381	.020118	-0.13	0.900	-.0426425	.0375664
_cons	.0144746	.011952	1.21	0.230	-.0093512	.0383004

```
. dwstat

Durbin-Watson d-statistic(  8,     80) =  1.795346
```

Annex VIII: Hausman test

```
. xtset Bankcode YEAR
       panel variable:  Bankcode (strongly balanced)
        time variable:  YEAR, 2018 to 2022
                delta:  1 unit

. xtreg ROA CAD LQ AQ LGR RR ID MKTCON , fe

Fixed-effects (within) regression               Number of obs      =        80
Group variable: Bankcode                        Number of groups   =        16

R-sq:  within  = 0.4985                         Obs per group: min =         5
       between = 0.1786                                        avg =       5.0
       overall = 0.1665                                        max =         5

                                                F(7,57)            =      8.09
corr(u_i, Xb)  = -0.9123                        Prob > F           =    0.0000
```

ROA	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
CAD	.0359089	.0201145	1.79	0.080	-.0043696	.0761874
LQ	.0105461	.0144041	0.73	0.467	-.0182976	.0393897
AQ	-.3901884	.1660695	-2.35	0.022	-.7227368	-.0576399
LGR	.0232838	.0066653	3.49	0.001	.0099368	.0366308
RR	-.002956	.0019903	-1.49	0.143	-.0069415	.0010294
ID	.0346119	.0095364	3.63	0.001	.0155155	.0537083
MKTCON	-.0513251	.0287793	-1.78	0.080	-.1089547	.0063045
_cons	-.0172552	.0146425	-1.18	0.244	-.0465764	.012066
sigma_u	.01505857					
sigma_e	.00474161					
rho	.90979564	(fraction of variance due to u_i)				

```
F test that all u_i=0:     F(15, 57) =     2.08                 Prob > F = 0.0244

. estimate store fe
```

```
. xtreg ROA CAD LQ AQ LGR RR ID MKTCON , re

Random-effects GLS regression                   Number of obs      =        80
Group variable: Bankcode                        Number of groups   =        16

R-sq:  within  = 0.4096                         Obs per group: min =         5
       between = 0.8147                                        avg =       5.0
       overall = 0.5976                                        max =         5

                                                Wald chi2(7)       =     79.80
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

ROA	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
CAD	.0282148	.0138346	2.04	0.041	.0010995	.0553301
LQ	-.012673	.0111548	-1.14	0.256	-.034536	.0091899
AQ	-.517175	.1315158	-3.93	0.000	-.7749412	-.2594088
LGR	.0037878	.0013092	2.89	0.004	.0012218	.0063538
RR	-.00078	.0015787	-0.49	0.621	-.0038743	.0023143
ID	.0242199	.0070837	3.42	0.001	.0103361	.0381038
MKTCON	-.0011899	.0194654	-0.06	0.951	-.0393413	.0369615
_cons	.0111131	.0118341	0.94	0.348	-.0120814	.0343076
sigma_u	.0022327					
sigma_e	.00474161					
rho	.18148342	(fraction of variance due to u_i)				

```
. estimate store re

. hausman fe re
```

	Coefficients (b) fe	(B) re	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
CAD	.0359089	.0282148	.007694	.0146012
LQ	.0105461	-.012673	.0232191	.0091131
AQ	-.3901884	-.517175	.1269866	.1014036
LGR	.0232838	.0037878	.019496	.0065354
RR	-.002956	-.00078	-.002176	.0012119
ID	.0346119	.0242199	.0103919	.0063847
MKTCON	-.0513251	-.0011899	-.0501352	.0211979

```
                b = consistent under Ho and Ha; obtained from xtreg
     B = inconsistent under Ha, efficient under Ho; obtained from xtreg

  Test:  Ho:  difference in coefficients not systematic

              chi2(7) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                      =       13.40
            Prob>chi2 =      0.0630
            (V_b-V_B is not positive definite)
```

IX: Random Effect Regression with Robust Standard Error

```
. xtreg ROA CAD LQ AQ LGR RR ID MKTCON , re robust

Random-effects GLS regression                   Number of obs      =        80
Group variable: Bankcode                        Number of groups   =        16

R-sq:  within  = 0.4096                         Obs per group: min =         5
       between = 0.8147                                        avg =       5.0
       overall = 0.5976                                        max =         5

                                                Wald chi2(7)       =    262.46
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000

                                  (Std. Err. adjusted for 16 clusters in Bankcode)
------------------------------------------------------------------------------
             |               Robust
         ROA |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         CAD |   .0282148   .0167671     1.68   0.092     -.004648    .0610777
          LQ |  -.012673    .0162361    -0.78   0.435    -.0444951    .0191491
          AQ |  -.517175    .139876     -3.70   0.000    -.7913269   -.2430231
         LGR |   .0037878   .0014644     2.59   0.010     .0009177    .006658
          RR |   -.00078    .0010365    -0.75   0.452    -.0028114    .0012515
          ID |   .0242199   .0078008     3.10   0.002     .0089306    .0395093
      MKTCON |  -.0011899   .0226288    -0.05   0.958    -.0455416    .0431617
       _cons |   .0111131    .014447     0.77   0.442    -.0172026    .0394288
-------------+----------------------------------------------------------------
     sigma_u |   .0022327
     sigma_e |  .00474161
         rho |  .18148342   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

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Appendix

Annex I: List of Private commercial Banks in Ethiopia

S/N	Bank Name	Web Site	Year Est.
1	Nib International Bank	https://www.nibbanksc.com/	1999
2	Abay Bank	http://www.abaybank.com.et/	2010
3	Addis International Bank	http://www.addisbanksc.com/	2011
4	Awash International Bank	http://www.awashbank.com/	1994
5	Bank of Abyssinia	http://www.bankofabyssinia.com/	1996
6	Berhan International Bank	http://berhanbanksc.com/	2010
7	Bunna International Bank	http://www.bunnabanksc.com/	2009
8	Cooperative Bank of Oromia	http://www.coopbankoromia.com.et/	2005
9	Dashen Bank	http://www.dashenbanksc.com	1995
10	Global Bank Ethiopia	http://www.debubglobalbank.com/	2012
11	Enat Bank	http://www.enatbanksc.com/	2013
12	Lion International Bank	http://www.anbesabank.com/	2006
13	Oromia International Bank	http://www.orointbank.com/	2008

14	Hibret Bank	http://www.unitedbank.com.et/	1998
15	Wegagen Bank	http://www.wegagenbanksc.com/	1997
16	Zemen Bank	http://www.zemenbank.com//	2009