


# THE EFFECT OF CAPITAL STRUCTURE ON PROFITABLITY OF COMMERCIAL BANKS IN ETHIOPIA

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**A THESIS SUBMITTED TO DEPARTMENT OF ACCOUNTING AND FINANCE IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTERS OF SCIENCE (MSC.) IN ACCOUNTING AND FINANCE**

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**WOLKITE, ETHIOPIA**

# THE EFFECT OF CAPITAL STRUCTURE ON PROFITABLITY OF COMMERCIAL BANKS IN ETHIOPIA

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# APPROVAL SHEET

## School of Graduate Studies

## The Effect of Capital Structure on Profitability of Commercial Banks in Ethiopia

This is to certify that the thesis proposal entitled "The Effect of Capital Structure On Profitability of Commercial Banks in Ethiopia" submitted in partial fulfillment of the requirements for the degree of Master's with specialization in Accounting and Finance, Department of Accounting and Finance, College of Business and Economics School of Graduate Studies, and has been carried out by Salih Jemal Redi; ID. NO. BEGR/075/14, under my supervision. Therefore, I recommend that the student has fulfilled the requirements and hence here by can submit the thesis to the department.

**Approved by Board of Examiners:**

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# DECLARATION

I declare that this work has not be previously submitted and approved for the award of a degree by this or any other university. I, Salih Jemal, have carried out a research proposal on “effect of Capital Structure on Profitability of Commercial Banks in Ethiopia”. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

Name: Salih Jemal _____ Signature: _____Date: _____

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# LIST OF ABBREVIATIONS/ACRONYMS

| | |
|---|---|
| BIB | Buna International Bank |
| BOA | Bank of Abyssinia |
| CBO | Cooperative Bank of Oromia |
| CBE | Commercial Bank of Ethiopia |
| DA | Deposit to asset |
| DE | Deposit to equity |
| DPA | Deposit to asset |
| DR | Debt ratio |
| GPM | Gross profit margin |
| LD | Loan to deposit |
| MM | Modigliani and Miller |
| NBE | National Bank of Ethiopia |
| NIB | Nib international Bank |
| ROA | return on asset |
| ROE | return on equity |
| OIB | Oromiya international Bank |
| PROF | Profitability |
| ROA | Return on Asset |
| ROE | Return on Equity |
| SMEs | Small and Medium-Sized Enterprises |
| TDTA | Total debt to asset |
| UB | United Bank |
| WACC | Weighted average capital cost |
| WB | Wagagen Bank |

# ABSTRACT

*This study investigates the effect of capital structure on the profitability of commercial banks in Ethiopia. The primary objective is to examine the relationship between various measures of capital structure, including debt-to-equity ratio, debt-to-asset ratio, and interest coverage ratio, and the profitability of core business operations of Ethiopian commercial banks. To achieve this objective, a quantitative research approach is employed, utilizing panel data from 16 commercial banks operating in Ethiopia from 2014 to 2023. The data is analyzed using descriptive statistics, multiple regression analysis, and diagnostic tests to assess the validity of the model assumptions. After the raw were collected and processed, results were computed, analyzed and presented using panel data analysis, descriptive statistics and correlation analysis methods and fixed effect regression output model. The fixed-effects model is selected based on the results of the Hausman specification test. The findings reveal several significant relationships between capital structure variables and bank profitability. Specifically, the debt-to-equity ratio, debt-to-asset ratio, and loan-to-deposit ratio exhibit statistically significant effects on bank profitability, with positive coefficients indicating a positive relationship. Conversely, interest coverage ratio and bank size demonstrate negative relationships with profitability. Moreover, growth appears to have a negative impact on profitability, suggesting that rapidly growing banks may face challenges in maintaining profitability amid expansion efforts. Based on these results, recommendations are made to Ethiopian commercial banks to carefully manage their capital structure, focusing on optimizing debt levels and ensuring adequate interest coverage to enhance profitability. Additionally, banks are advised to consider the implications of their growth strategies on profitability and to prioritize efficiency and risk management in their operations. Overall, this study contributes to the existing literature by providing empirical evidence on the relationship between capital structure and profitability in the context of Ethiopian commercial banks, offering insights that can inform strategic decision-making and improve financial performance in the banking sector.*



**Keywords:** Profitability, Capital structure, return on Asset, Return on Equity

# CHAPTER ONE

# INTRODUCTION

This chapter is structured to offer a concise summary of the broad objectives of the study and the formulated hypotheses, providing a clear understanding of the research direction. Additionally, it outlines the underlying principles of the research methodology adopted, emphasizing the rationale behind the chosen research methods and their suitability for the analysis. Through this organization, readers gain insight into the overarching goals of the study, the hypotheses tested, and the methodological approach employed, laying the groundwork for the subsequent analysis and interpretation of the empirical evidence.

## 1.1. Background of the Study

In today 's highly capitalistic global economy the financial sector is one of the sectors that play a substantial role by serving as the source, the means and the facilitating agent of the flow of finance and capital in business, investment or any other activity done at different levels. And, as a result of an increasing spate of globalization and an equally increasing dependence on it, the global financial sector became fiercely competitive (Anarfo & Appiahene, 2017). Banking being a major form of financial service provides the means for access and exchange of capital which is a very important element of any economic activity.

Capital structure is a verified interesting issue for the researchers and has been studied from different alternative perspectives. Researchers have quick towards this topic when Modigliani and Miller (2011) proposed the theorem of irrelevancy. Gharaibeh (2015), Goyal (2013), Hailu (2015), Ibrahim (2015), Rafique (2011), Sakti, Tareq, Saiti, and Akhtar (2017), Kim and Lee (2017), Meero (2015) and many more have studied capital structure. According to Chechet and Olayiwola (2014), organizations can raise funds by two means i.e., internally or externally. Internally, an organization tends to finance its operation from retained earnings while externally the options of raising debt and issuance of shares are available.

The capital structure consists of a company’s equity and debt (Arulvel & Ajanthan, 2013). Moreover, Addae, Nyarko-Baasi, and Hughes (2013) declare that profitability, firm’s value, shareholder’s wealth and value are all used interchangeably because they show the creation of wealth for shareholders. According to Zeitun and Tian (2007), the firm’s revenue can be

maximized if the firm's managers can identify the optimal capital structure. Zarrouk, Jedidia, and Moualhi (2016) identified the differences between Islamic and conventional banks. Islamic banks' activities should comply with Shariah and Quran and don't believe in interest in contrast to conventional banks.

Different perspectives on capital structure can be found in the literature. Modigliani and Miller's (2011) theorem, which is based on the notion of perfect markets, states that a bank's capital structure choice has little bearing on its total value. Another body of research focuses on the disciplinary effect of debt on managers. As a result, expanding capital may cause managers to lose their discipline, resulting in poor performance. Lastly, the third point of view contends that optimal capital structure reduces the moral hazard between shareholders and debtholders (Diamond, 2014). Monitoring, on the other hand, is expensive, and banks require inducement to monitor on behalf of their debtors (Danisewicz et al., 2021). Greater amounts of capital, according to this theory, improve the banks' interests to supervise their debtors as shareholders will receive a bigger proportion of asset payoffs and suffer further in the event of failure (Flannery & Giacomini, 2015). This illustrates why capital ratios may have a favourable impact on the profitability of banks. Larger margins, either from improved efficiency or from increased market dominance, could be used to generate such a rise in ROE and ROA (Mirzaei et al., 2013; Aysen Doyran, 2013). Our empirical technique is to look at the numerous factors that influence the ROE and ROA and see if the leverage ratios play a role (Ibhagui & Olokoyo, 2018). Yet, it is beyond the scope of this study to discuss how the ROE and ROA might change. This research adds to the body of knowledge in several ways. First, the paper is the first to examine what determines the bank capital structure in Vietnam.

The conventional textbook response is that banks' financing choices do not have to be investigated because capital regulation is the overarching divergence from Modigliani and Miller's hypotheses. For example, due to the high expenses of retaining capital, bank management frequently desires to maintain less bank capital than the regulated amount. The level of bank capital required in this situation is defined by the bank capital standards (Mishkin, 2016). Interpreted correctly, this means that the leverage ratio of banks subject to the Basel I regulatory framework may have little cross-sectional change, as it mandates a consistent capital ratio. The capital ratios of banks vary, but the average number has dipped from 9.931% (2012) to

7.825% (2019), which is below the minimum capital adequacy ratio (8%), according to the Circular no. 41/2016/TT-NHNN (International Monetary Fund, 2021).

The figures suggest that the capital structure of banks should be investigated thoroughly. Second, according to Batten and Vo (2016), Vietnamese banks are under stress to diversify their sources of non-traditional revenue. Income differentiation, on the other hand, necessitates modifications in the capital structure of the bank. Greenlaw *et al*. (2008) believe that rather than legal restraints, banks' active control of their capital structures in connection to internal value-at-risk was a primary destabilizing element. Aside from current concerns over high levels of non-performing loans, the traditional practices of Vietnamese commercial banks are also causing worry among many stakeholders (Nguyen et al., 2021).

It is interesting to investigate how bank capital structure supports income diversification and complies with authority regulations. Finally, while the State Bank of Vietnam is still a central bank, it is now regarded as a ministerial-level institution of the Vietnamese government (Vo, 2016), raising concerns about giving state-owned banks preferential treatment over other banks. Such incentives assist state-owned banks in becoming preferred lenders for public infrastructure projects, which may be a significant source of revenue.

As a result, state-owned banks may have a different capital structure than other banks to sustain their operations and investments and create profits. Banks can better meet their debt obligations with Basel II and Basel III of CAR regulations. With a higher CAR ratio, the bank's capital structure is financed with more bank capital and is safer to operate. However, too high or too low a CAR ratio is not good, and a reasonable CAR ratio is needed for banks (Nguyen *et al.*, 2021). In Vietnam, 92.4% of the banks have the optimal CAR higher than the minimum ratio of 10.5% defined in BASEL III (Nguyen *et al.*, 2021). It means that Vietnamese banks need to increase capital and reduce debt in their capital structure for better profits and safer operation.

In the contexts of Ethiopia, there are a few studies in relation to determinants of capital structure and determinants of profitability distinctly studied by deferent researchers. For example, Ashenafi (2005) managed a case study in Addis Ababa Small and Medium enterprises, whereas Amanuel (2011) wrote using evidence from manufacturing share companies of Addis Ababa city. In addition, Bayeh (2011) assessed using evidence from Ethiopian insurance companies. Moreover, in the banking industry of the country, Weldemikael (2012) studied on determinants

of capital structure of Commercial Banks in Ethiopia while Amdemikael (2012) assessed factors affecting profitability of banks with a focus on overall performance. For the purpose of this study core business operations of commercial banks were defined as 'the banks' operations of deposit mobilization and providing loans to customers.

Knowledge of the effect of financing decision or capital structure on profitability of banks would help financial managers to predict and mitigate potential problems associated with their financing decision. Particularly, acquiring knowledge of the effect of capital structure on profitability of banks' core business operations will have significant benefit to manage financing decision in a way that meets the goal of firms; shareholders' wealth maximization. Therefore, given the unique features of banks' financial structure and the environment in which they operate, there are strong grounds for a separate study on the effect of capital structure on profitability of commercial banks in Ethiopia by emphasizing on banks' core business operations profitability.

## 1.2. Statements of the problem

In a global context, the relationship between capital structure and profitability has garnered substantial attention across various industries and economies. Numerous studies, such as those by Rajan and Zingales (1995) and Frank and Goyal (2009), have explored this relationship in different contexts, emphasizing its significance for firm performance and sustainability. Understanding how capital structure decisions affect profitability is particularly crucial in the banking sector, where access to capital and efficient allocation of resources play pivotal roles in driving economic growth and stability. In emerging economies like Ethiopia, where the banking sector is rapidly evolving, insights from global research can offer valuable guidance for policymakers, regulators, and bank managers in formulating effective strategies to enhance financial performance while ensuring stability and resilience in the face of dynamic market conditions.

As has been mentioned in the background section above the financial sector plays a significant role in assisting the multifaceted development of especially the developing countries of the world (Mhlanga, 2021). The same is true for Ethiopia which is a developing country that has shown notable economic growth but still challenged by macro and micro economic factors which have been evident in the financial sector too (Jimma, 2014). As Zinabu (2019) also argues if managed

appropriately, the financial sector, by extricating the people from poverty, has the potential to facilitate and fuel capital development. Therefore, in order to get the best out of this sector due attention should be given to the work of identifying its challenges and prospects.

In the contexts of Ethiopia, there are a few studies in relation to determinants of capital structure and determinants of profitability distinctly studied by deferent researchers. For example, Ashenafi (2005) managed a case study in Addis Ababa Small and Medium enterprises, whereas Amanuel (2011) wrote using evidence from manufacturing share companies of Addis Ababa city. In addition, Bayeh (2011) assessed using evidence from Journal of Poverty, Investment and Development Ethiopian insurance companies. Moreover, in the banking industry of the country, Weldemikael (2012) studied on determinants of capital structure of Commercial Banks in Ethiopia while Amdemikael (2012) assessed factors affecting profitability of banks with a focus on overall performance. For the purpose of this study core business operations of commercial banks are defined as 'the banks' operations of deposit mobilization and providing loans to customers.

In Ethiopia's banking sector, understanding the relationship between capital structure and profitability is crucial for ensuring financial stability and sustainable growth (Abebe, 2014; Ayalew, 2021). Despite the significance of this relationship, there remains a gap in the literature regarding its specific dynamics within the Ethiopian context (Hamza, 2022). While studies exist on the broader topic of capital structure and profitability in global contexts, there is a lack of empirical evidence focused specifically on Ethiopian commercial banks. This gap limits the ability of policymakers, investors, and banking professionals to make informed decisions tailored to the unique characteristics of the Ethiopian banking industry. Therefore, there is a pressing need to investigate the effect of capital structure on the profitability of commercial banks in Ethiopia to fill this void in the literature.

For example, a research by Marandu & Sibindi (2016) is one of the studies conducted on the topic of capital structure and its impact on profitability on the commercial banks of South Africa. The study found out that there was significant relationship between profitability and the determinants of capital. Another study by Singh & Bagga (2019) found out a similar result that there was a significant positive relationship between capital structure and profitability. Another study by Samuel (2016) conducted among selected commercial banks in Kenya revealed that

even though its effect was minimal; capital structure affected the profitability of commercial banks in Kenya. Among the studies conducted in Ethiopia, the one by Negasa (2016) also showed that there was positive relationship between capital structure and profitability. Similarly, a research conducted by Chang et al. (2019) found out that there was negative relationship between capital structure and profitability.

In this vein another study by Ebaid (2018) among selected firms in Egypt also showed that capital structure had a weak-to-no impact on firm's performance. The findings of studies conducted in Ethiopia further witnessed the prevalence of the inconsistency. For example, Tigist (2018) concluded that measured by total debt to asset had negative and positive relationship with performance. Recent research underscores the importance of understanding the intricacies of capital structure decisions and their impact on bank profitability in emerging economies like Ethiopia. For instance, studies by Belete, Solomon, and Molla (2020) highlight the complexities of capital structure dynamics in Ethiopian commercial banks, emphasizing the need for further investigation. Additionally, Ahmed, Rahman, and Islam (2021) emphasize the critical role of capital structure in enhancing the financial performance and stability of banks in developing countries. Therefore, given the unique features of banks' financial structure and the environment in which they operate, there are strong grounds for a separate study on the impact of capital structure on profitability of commercial bank of Ethiopia by emphasizing on its' core business operation profitability. These studies underscore the relevance and urgency of exploring the relationship between capital structure and profitability within the Ethiopian banking sector. By addressing this gap, the research aims to provide valuable insights that can inform strategic decision-making and contribute to the overall development of the Ethiopian banking industry.

This paper, therefore, provides to examine the effect of leverage/capital structure on profitability of commercial banks in Ethiopia with an emphasis on banks' core business operations as it was defined as the banks' operations of deposit mobilization and providing loans to customers. The result intends to equip financial managers with applied knowledge of the potential problems in profitability and capital structure, as well as determining their optimal level of capital structure to achieve optimum level of firm's profitability so that to meet wealth maximization goal of firms. Furthermore, it intends to serve as a base for policy makers in considering the minimum capital requirement of banks operating in the country.

## 1.3. Objective of the Study

### 1.3.1. General objective

The general objective of the study to investigate the Effect of capital structure on profitability of commercial bank in Ethiopia.

### 1.3.2. Specific objectives:

In line with the above general objective, the study has the following specific objectives.

1. To study the effect of total debt to asset on profitability of commercial banks in Ethiopia
2. To know the effect of debt to equity on profitability of commercial banks in Ethiopia
3. To examine the effect of interest coverage ratio on profitability of commercial banks in Ethiopia
4. To analyse the effect of loan to deposit on profitability of commercial banks in Ethiopia
5. To analyse the effect of loan to deposit on profitability of commercial banks in Ethiopia
6. To investigate the effect of spread on profitability of commercial banks in Ethiopia
7. To determine the effect of asset growth on profitability of commercial banks in Ethiopia
8. To investigate the relationship between asset size and profitability of core business operation of commercial banks in Ethiopia
9. To examine the relationship between bank year and profitability of core business operation of commercial banks in Ethiopia

## 1.4. Significance of the Study

The significance of this study lies in its potential to contribute valuable insights to the financial landscape of Ethiopia, particularly within the commercial banking sector. By investigating the relationship between capital structure and profitability, the study can provide crucial information to policymakers, bank managers, investors, and other stakeholders. Understanding how various factors such as debt, equity, interest coverage, and asset composition influence bank profitability can help in formulating effective financial policies, optimizing capital structure decisions, and enhancing the overall financial performance of commercial banks. Moreover, as Ethiopia undergoes economic development and financial sector reforms, the findings of this study can offer timely guidance for stakeholders seeking to navigate and capitalize on emerging opportunities in the banking industry. Furthermore, the study's focus on Ethiopian commercial

banks fills a gap in the existing literature, providing region-specific insights that can complement and enrich the broader body of knowledge on capital structure and profitability in the banking sector. Ultimately, the study's findings have the potential to inform strategic decision-making processes and contribute to the sustainable growth and stability of the Ethiopian banking sector. Three it is also hoped that the findings of this study will serve as an additional input for policy makers

## 1.5. Scope of the Study

The study's time scope spans a specified period, focusing on data collected from commercial banks in Ethiopia over the past decade, from 2014 to 2023. This timeframe allows for an analysis of trends and patterns in capital structure and profitability within the Ethiopian banking sector over a significant period of time. Methodologically, the study employs quantitative research methods to analyze the relationship between various indicators of capital structure and bank profitability. Statistical techniques such as regression analysis was used to assess the impact of factors such as debt ratios, interest coverage, and asset composition on bank profitability metrics. Geographically, the study is confined to the Ethiopian context, specifically targeting commercial banks operating within the country's borders. By focusing on Ethiopia, the study aims to provide insights tailored to the unique economic, regulatory, and financial environment of the Ethiopian banking sector, which may differ from other regions or countries. This geographical scope ensures that the findings of the study are relevant and applicable to stakeholders within the Ethiopian banking industry.

## 1.6. Limitations of the Study

Despite the rigorous methodology and comprehensive approach undertaken in this study, several limitations should be acknowledged. Firstly, the study's reliance on secondary data sourced from financial reports and databases may be subject to inaccuracies or inconsistencies inherent in the data collection process. Additionally, the availability and quality of data may vary among commercial banks, potentially impacting the robustness and generalizability of the findings. Secondly, while the study aims to analyze the relationship between capital structure and profitability, it may not account for all relevant variables or external factors that could influence bank performance. Factors such as market conditions, regulatory changes, and macroeconomic trends may not be fully captured within the scope of this study. Thirdly, the study's geographical

scope is limited to commercial banks operating within Ethiopia, which may restrict the applicability of the findings to other banking sectors or regions. Furthermore, the study's temporal scope covers a specific period, and trends identified within this timeframe may not necessarily reflect long-term patterns or future developments in the banking industry. Lastly, the study's quantitative approach may overlook qualitative aspects or nuances that could provide deeper insights into the dynamics of capital structure and profitability in commercial banks. Despite these limitations, the study endeavors to provide valuable insights and contribute to the existing body of knowledge in the field of banking and finance.

## 1.7. Organization of the Paper

To fulfill the objectives of this study, the research paper is structured into five chapters. The first chapter introduces the background of the study, statement of the problem, objectives, significance, and scope of the research. Chapter two provides a comprehensive review of both theoretical and empirical literature relevant to the study. In the third chapter, the research methodology is detailed, covering aspects such as research design, population and sample, methods of data collection and sources, and methods of data analysis. The fourth chapter presents the results obtained from the study and initiates discussion around them. Lastly, the fifth chapter concludes the research and offers recommendations based on the findings.

# CHAPTER TWO

# REVIEW OF RELATED LITERATURE

## Introduction

This chapter presents review of related literature. The review has three separate sections that deal with the conceptual, theoretical and empirical frameworks of the study. In the conceptual framework part the concept of capital structure, its elements and variables and the different views and arguments of scholars and researchers are dealt. In the theoretical and empirical review sections discussions of the five major theories of capital structure and the findings of studies conducted in other countries and in Ethiopia are presented respectively. In addition to these the chapter also has parts that deal with a textual and graphical presentation of the conceptual framework of this particular study and a brief discussion of the research and knowledge gap.

## 2.1. Theoretical Literature Review

### 2.1.1. The Concept of Capital Structure

Capital structure is one of the major topics among scholars in cooperate finance. It is commonly defined as the mode of finance which entails the combination or mix of debt and equity (Drake et al., 2017). While debt and equity are the major elements of capital structure the ability of the organization to carry out their stakeholders need is closely related to it. In this vein (Saad, 2010) by adding another element defines capital structure as "the way a firm finances its assets across the blend of debt, equity or hybrid securities". The other point worth mentioning here is that capital structure is an important decision of a firm and it is also something that has been controversial in nature.

Capital structure is essential to how a firm finances its overall operations and growth by using different sources of funds. According to Modigliani & Miller, it is the broadly accepted capital structure theory because it is the foundation of capital structure theory which has been used by many researchers. The theory also gives, which firms receive direction and orientation concerning their business activities. It is said to be the financing performance of a firm. In addition to a capital structure represents a means for decision making of business firms and

facilitates maximization of return on investment, as well as boosting the efficiency of financing and dividend decisions (Chandrasekharan, 2014). According to Khum-aloand et al. (2011) a capital structure is a combination of equity and debt to the firms. The study further added that a firm can select among several alternative sources of capital with different mix of securities. This definition is focusing on the specific proportion of debt and equity used for financing of company.

Capital structure is the combination of debt and equity source of finance. Capital structure is covered the proportion of the long-term sources of funds used by a firm. It includes debt, preferred stock and common equity. Capital structure is the mix of financing, required to finance the real time investments. Debt source of finance sometime also known as leverage is external source of financing. A firm can choose any capital structure as wishes. It is the result of deliberate choice on the corporate management, investor's attitudes and market conditions for long-term. A manufacture firm could increase or decrease its debt or equity portion by either issuing some debt to buy back stock or issuing stock to pay debt. The main objective of capital structure decision is how to mix the financial sources used by the firm and how to maximize the shareholders' wealth and minimize the firm's cost of capital. The right combination of capital structure of is known as optimal capital structure (Amanuel, 2011)

The influence of debts source of finance on performance of the firms observed by those theories which includes: tax theory, agency cost theory and signaling theory. The signaling theory revels that when the information is availed, then debt should have a positive and significant impact on performance of the firms. The agency theory, on the hand presented that debt source of finance can have two different effects on performance of the firms, both negative and positive. The positive effect occurs where there is an agency cost between principle and agent. As taxation theory, the influence of taxation is dynamic in nature, according to this principle; it isnot easy to establish a correlation between debt and performance; as it is dependent on tax deductibility of interest, revenue, tax and no liabilities tax cushion (Kebewar and Shah, 2012).

### 2.1.2. Components of Capital Structure

In general, a capital structure divided into two components that are debt and equity financing source in firms/ organization.

**Equity Financing:** Equity is one of the sources of finance that represents the ownership of the firm or the company. Equity shares are popular among the investing class. The form of equity finance source such as common stock and preferred stock. The common equity represents the amount that all common shareholders have invested in a company. According to (Evans, 2000), capital consists of two classifications those are Contributed capital, which is the money that was originally invested in the business in exchange for shares of stock or ownership and Retain earnings, which represent profits from past years that have been kept by the company and used to strengthen the balance sheet or fund growth, acquisitions, or expansion.

**Debt Financing:** According to Evans (2000), The debt finance source sometimes known as internal source of finance it also composed of short term and long term debt. The safest type is generally considered long-term debt because the company has years, if not decades, to come up with the principal, while paying interest only in the meantime in components of capital structure, debenture capital is a part of borrowed capital; the creditors of the company are the debenture holders.

### 2.1.3. Financial Performance

A financial performance is profitability ratios such as Return on Assets, Retained Income, Earnings per share, Return on Equity, Net Profit margin, Price per Earning ratio, Market Capitalization, etc. When determining (or other monetary unit) invested by shareholders Return on Equity is measured as Net Income dived to Average Shareholders‟ Equity (including Retained Earnings) (Evans, 2000).

$$\text{Return on Equity (ROE)} = \text{Income Net}/StockholdersEquity$$

## Leverage

The capital structure of a firm consists of debt and equity. Debt is by considering further classified into short and long term. (Gibson, 2013) argues that firms benefit from tax deduction through leverage, which in turn increases the value of the firm. As such, a positive relation is

detected between leverage and performance of the firms. Different literatures often discuss these components as ratio of total assets and equity. The components are discussed hereunder:

**Short Term Debt Ratio (STDR)**

The ratio of short term debt represents the portion of company's assets that financed by debt below than one year, while it can be calculated short term debt to total asset. This measures how relative short-term debts to total asset of a firm are to be repaid within an accounting period. The short term debt to total assets ratio is a measure of the financial leverage of the company. It tells what percentage of the assets is financed by short term debt (Gibson, 2013).

**Long Term Debt Ratio (LTDR)**

A long term debt is the amount owed for a period exceeding of one year and it appear in the balance sheet. This type of debt may be in the form of a bank loan, mortgage bonds, debenture, or other obligations not due for one year. It is calculated as the total long term debt divided by total asset, while this ratio shows the percentage of firms' assets financed through loans that above than one year (Gibson, 2013).

**Debt Equity Ratio (DER)**

The Debt-to-Equity Ratio, sometimes also referred to as the leveraging ratio or the gearing ratio, measures the relative proportion of shareholders' equity and debt used to finance a company's assets. It indicates the proportion of borrowed funds to own funds. The debt to equity ratio is calculated by dividing the company's total debt divided by shareholder's equity. Shareholder's equity or equity shareholders' funds or net worth is arrived at by adding up equity capital and reserves. The ratio is borrowed funds as the number of times of own funds. It indicates what proportion of equity and debt the company is using finance its assets. A high debt/equity ratio generally means that a company has been aggressive in financing its growth with debt.

The debt to equity ratio is considered a balance sheet ratio because all of the elements are reported on the balance sheet. Each industry has different debt to equity ratio benchmarks, as some industries tend to use more debt financing than others. A lower debt to equity ratio usually implies a more financially stable business, firms with a higher debt to equity ratio are considered riskier to creditors and investors than firms with a lower ratio. Unlike equity financing, debt must

be repaid to the lender. Since debt financing also requires debt servicing or regular interest payments, debt can be a far more expensive form of financing than equity financing (Gibson, 2013)

**Total Debt to Asset Ratio**

The debt to asset ratio is a leverage ratio that measures the amount of total assets that are financed by creditors instead of investors. In other words, it shows what percentage of assets is funded by borrowing compared with the percentage of resources that are funded by the investors. Basically it illustrates how a company has grown and acquired its assets over time. Companies can generate investor interest to obtain capital, produce profits to acquire its own assets, or take on debt. Obviously, the first two is preferable in most cases.

This is an important measurement because it shows how leveraged the company by looking at how much of company's resources are owned by the shareholders in the form of equity and creditors in the form of debt. Both investors and creditors use this figure to make decisions about the company. Investors want to make sure the company is solvent, has enough cash to meet its Creditors, on the other hand, want to see how much debt the company already has because they are concerned with collateral and the ability to be repaid. If the company has already leveraged all of its assets and can barely meet its monthly payments as it is, the lender probably won't extend any additional credit.

$$debt\ to\ asset\ ratio = total\ debt/total\ asset$$

**Deposit to Asset (DPA)**

Deposit to Asset (DPA)as the major source of external finance is deposits; deposit to asset ratio was used as an independent variable to examine the impact of deposit on profitability of commercial banks in Ethiopia. Since the total debt of banks composed of deposit and non-deposit liabilities, this variable intended to show the impact deposit finances and hence the non-deposit financing decision on profitability. Abbadi and Abu-Rub (2012) found Positive relationship between deposit to asset and profitability, Based on the nature of banks operation and empirical evidences, in this study a positive relationship between deposit to asset ratio and profitability of banks were expected. The formula used to calculate this variable was;

$$DPA = Total\ Deposit\ to\ Total\ Asset$$

**Loan to Deposit Ratio (LD)**

The formula for the loan to deposit ratio is exactly as its name implies, loans divided by deposits. The loan to deposit ratio is used to calculate a lending institution's ability to cover withdrawals made by its customers. A lending institution that accepts deposits must have a certain measure of liquidity to maintain its normal daily operations. Loans given to its customers are mostly not considered liquid meaning that they are investments over a longer period of time. Although a bank will keep a certain level of mandatory reserves, they may also choose to keep a percentage of their non-lending investing in short term securities to ensure that any monies needed can be accessed in the short term.

$$loan\ to\ deposit\ ratio = loans/deposits$$

### 2.1.4. Factor affects Financial Performance of the Firms

**SPREAD**

One of the expected benefits of financial liberalization and deepening of the financial sector is the narrowing of the interest rate spreads, i.e. the difference between the interest rate charged to borrowers and the rate paid to depositors. This is predicated on the understanding that liberalization enhances competition and efficiency in the financial sector. The purpose of this variable in this study was to serve as control variable. Khum-aloand *et al.* (2013) used the definition of spread as the difference between income received on loans (divided by total loans) and interest paid on de-posits (divided by total deposits). The empirical studies of Vickery (2011) and Hailu (2016) revealed a positive relationship between spread and net interest margin or profitability. Due to the fact that the profitability of core operations of banks depends on interest income and expense and in line with empirical evidences, in this study a positive relationship between spread and profitability was expected.

The formula used to calculate was:

$$spread = (interestincomeinterestpaid)/(loan\&advancedeposit$$

**FIRM SIZE**

The firm Size is one of the most widely accepted and determines the level of economics of scale of the firms. When a firm economics of scale is larger the average production cost is lower and

operational activities are more efficient. The size of the firm, which is measured by the logarithm of total assets, could influence its financial performance. Prior research suggests that firm's size may influence its performance, larger firms have a greater variety of capabilities and can enjoy economies of scale, which may influence the results and the inferences, so firm size is considered as a control variable in the model (Hailu, 2016) and Kajola, 2010(Salim and Yada, 2012).

$$Size\ (SZ) = Naturallog$$

According to trade off theory, the larger firms are having stable cash flows and less chance of bankruptcy. Hence, the large firms prefer leverage and are having high level of leverage. Therefore, the relationship between firm size and leverage is positive (Myers, 1984). However, some firms may become too large that they incur high structural and operational cost. Salim and Yada (2012) asserted the size of the company can have a positive effect on financial performance because the larger firms can use this advantage to get some financial benefits in business relations. Salim and Yada (2012) also found a significant positive relationship between firm size and financial performance measures.

## 2.1.5. Theories of Capital Structure

### 2.1.5.1. Modigliani and Miller

Modigliani and Miller theory is published in (1958) by Merton Miller and Franco Modigliani. They suggests that the value of firms not affected by combination debt and equity source of finance. The absence of taxes and other market imperfections, the value of the total does not change as it is divided into debt, equity, and other securities. They believed that the firm value is determined based on the active side of the balance sheet and the value is generated by the earning power and risk of the underlying asset. The total value of the firm must be the same, when the firm's combing of different financing. Based on this theory capital structure is irrelevant.

Gujarat (2004) show that a company performance and its value is a growing function of leverage because of interest payments is the tax deductible at the company's level. Practically the market is ineffective because of the agency costs, transaction costs, tax, asymmetric information and costs of financial distress and any other incomplete components. Their theory has been criticized

too much because of some weak points and its irrelevant hypothesizes of the reality, but it still supplies the basis for many other theorems proposed by many researchers.

In corporate finance theories, the seminal work by Modigliani and Miller (1958) in capital structure provided a basis for the development of the theoretical framework within which various theories were about to emerge in the future. Modigliani and Miller (1958) concluded to the broadly known theory of "capital structure irrelevance" where financial leverage does not affect the firm's value. However, their theory was based on very restrictive assumptions that do not hold in the real world. These assumptions include no taxes, no transaction costs, homogenous expectations, and perfect capital markets. The existence of bankruptcy costs and tax advantageous of interest payments lead to the concept of an "optimal" capital structure which maximizes the value of the firm, and hence minimizes its total cost of capital. Modigliani and Miller (1958) reviewed their earlier position by incorporating tax benefits as determinants of the capital structure of firms. The key feature of taxation is that interest is a tax-deductible expense. A firm that pays taxes receives a partially offsetting interest "tax-shield" in the form of lower taxes paid. Hence, Modigliani and Miller (1963) proposed to use as much debt capital as possible in order to increase profitability and hence maximize the value of firms

Perfect Capital Market

- No taxes
- Investors are Rational
- Here are no brokerage costs
- There are no bankruptcy costs
- The EBIT is not affected by the use of debt
- No bankruptcy costs etc.

The basic and old theories of capital structure basically say that an optimal level of capital structure is good and required by firm. It will help in reducing the cost and it will also result in increasing the profits. Therefore, MM conclude that the market value of a firm is independent of its capital structure in perfect capital markets with no income taxes. In summary the theory states that the value of a firm is invariant with respect to its leverage policy in an arbitrage -free market when there is no corporate income tax and no bankruptcy cost: whether firm is financed through debt or equity, its value remains the same.

### 2.1.5.2. The Tradeoff Theory

The trade-off theory of capital structure is one of the most common explanations to firms‟ capital structure. The trade-off theory assumes that the optimal capital structure can be determined by finding the balance between the debt benefits of tax savings and the debt costs of higher risk for financial distress. The trade-off theory is built on the tax advantage of debt financing in business firms. Trade-off theory indicates two features in debts financing, one is profitability, and one is the risk. This theory supplies a probability that a firm might get optimal capital structure, which is an improvement of capital structure (Gujarat, 2004).

Appiadjei (2014) examined the influence of capital structure on performance of the firms for all 35 companies listed on Ghana stock exchange for the period 2004-2008 and observed that there was a direct relation between short term debt and profitability and positive relation between long term debt and profitability. Anafo et al. (2015) also analyzed the relationship between capital structure and profitability for Ghanaian banks during 2007- 2013. They found that there was a direct relation between short-term debt and ROA (return of assets), ROE (return on equity), and EPS (earning per share); and reverse relation was found between the long term debt and dependent variables of the study except for EPS. Moreover, Zafar et al. (2016) investigated the influence of capital structure on banking performance for 25 banks listed on Karachi stock exchange and found the positive relationship between debt to assets and performance indicators such as ROA, ROE and EPS. In addition to that, Addae et al. (2013) examined the association between profitability and capital structure during 2005-2009 for Ghana.

In this vein Siddik et al. (2017) citing Brigham and Houston (2004) say that according to the tradeoff theory the optimal capital structure of a firm is determined by the tradeoff of the benefits of using debt known as tax savings and the costs of debt such as agency costs. It has also been stated by the tradeoff theory that firms having more physical assets should employ additional debt capital as these physical assets would be collateral. In indicating the point of emphasis of the tradeoff theory Singh & Bagga (2019) say that the theory focuses on two concepts. These are cost of financial distress and agency costs. The theory also acknowledges the tax advantage from interest payments. As has been mentioned previously the task of identifying the right mix of the benefits and the costs has been a challenging one.

### 2.1.5.3. Pecking Order Theory

This theory also begins through the asymmetric information in the firms. The pecking order theory is based on asymmetric information between managers of a company and external investors. The pecking order theory is explaining how companies select to get new funding for their future activities and growth. The firm manager has more information than external parties about the firms risk, return, value of the firms, and prospects of the business, the information determine the choice of internal and external finance as well as choice of between debt and equity financing. The pecking order theory suggested a substitute interpretation of why companies select particular capital structure, famed as the pecking order theory (Gujarat, 2004)

According to the pecking order model the firms will first use internal funds or retained earnings before issuing debt and will finally only issue equity under duress or when the investment requirement so far exceeds debt capacity that it would lead to excessive leverage (Gujarat, 2004). To avoid the problem arising from information asymmetry firms usually fulfill their financing needs by preferring retained earnings as their main source of financing, followed by debt and finally external equity financing as the last resort. This theory explains that the company has the sequence of preference in choosing a source of corporate funding (Gujarat, 2004) Therefore, the profitable firms are in less need of debt, pecking order theory assumes a negative relation between financial leverage and firm-performance. This negative relationship the empirical study supported by named as (Gujarat, 2004).

Here it can be said that among the different aspects of capital structure and a bank's activity, this theory emphasized the order of financing actions and sources. In further explaining this idea of order Abeywardhana (2017) notes that firms utilize internal funds first then issue debt and finally as the last resort issue equity capital. In relation to this Singh & Bagga (2019) add that according to this theory "companies show a distinct preference for utilizing internal finance. If internal funds are insufficient to finance investment opportunities or company might obtain external finance but it will choose among various external finance sources so as to minimize additional costs."

According to pecking order theory, there are three possibilities for financing an organization: an internal source of fund, debt, and equity. This theory places the internal source of fund at the top

of the priority, but the problem arises when the internal fund is exhausted. Externally, organizations seek two ways of financing. First, to get funds from credit holders and the second way is to issue shares. Issuance of shares to get the finance is placed in the last of hierarchy. Pecking order theory suggests a negative relation between leverage and profitability which is shown by researchers. Hailu (2015) explored the influence of capital structure on the performance of conventional banks in Ethiopia for the period 2001-2012 and observed that debt to asset ratio had a negative relation to the profitability.

#### 2.1.5.4. Agency Cost Theory

The theory was developed on the thought that the interest of shareholders. The conflicts between shareholders and managers, as well as the conflicts between shareholders and bondholders will raise costs in the firms operating, investing and financing activities. As such, it should be expected that a positive relationship will exist between corporate performance and firm leverage (capital structure) under agency theory. They argued that agency costs arise because of the separation of ownership and control. The theory posits that firm's capital structure is determined by agency costs, which includes the costs for both debt and equity issue. The costs related to equity issue may include: the monitoring expenses of the principal (the equity holders), the bonding expenses of the agent (the manager), and reduced welfare for principal due to the divergence of agent's decisions from those which maximize the welfare of the principal.

According to Gujarat (2004), the agency cost is a combination of direct and indirect costs which results from principals and agents acting in their own best interest. Shareholders want an increase in the value of the firm, Managers prefer flexibility in decision making while Creditors are concerned about getting their money back. The Agency theory and optimal capital structure" argues that Agency costs arises because managers own only a fraction of the shares of the company. This partial ownership will cause the managers to work less vigorously and will consume more luxuries, like company cars, expensive hotels, since majority of the owners share most of the costs.

#### 2.1.5.5. The Market Timing Theory

The Market Timing Theory is contrast with the pecking order theory and the trade-off theory claims that 'market timing' is the first order determinant of a corporation's capital structure use

of debt and equity source of finance (Graham, 2003) In other way, firms do not generally care whether they finance with debt or equity; they just choose the form of financing which, at that point in time, seems to be more valued by financial markets. The organization or the firm's issues equity securities when they perceived that their stocks are overvalued and buys it back when they find that shares are undervalued.

Market timing theory was propounded by Baker and Wurgler (2002). Abeywardhana (2017) revealed that the decision of the firms for issuing new equity or not is related to the overrating and underrating of their share price. And according to this theory firms issue new equity when their share price is overrated and they buy back shares when the prices of shares are underrated. Similarly, Singh and Bagga (2019) say that companies time their equity issues in a way that they issue the fresh stock when the stock prices are overvalued and buy back shares when they are undervalued.

This theory states that manager should takes advantage of the information gap and makes critical analysis of the funds market. The importance of this is information asymmetry can be costly to firms if the investors misinterpret the manager's behavior and charge them unfairly that is affecting the firm's performance. Banker and (Polk and Sapienza, 2009) recommend this new theory of capital structure, which suggests that managers can increase current shareholder's wealth by timing the issue of securities. Therefore, firms time their equity issues by selling new stocks when the stock price is perceived to be overvalued and buying back own shores when they are undervalued.

## 2.2. Empirical Evidence

Salim & Yadav (2012) examined the relationship between capital structure and firm performance. The investigation was performed using panel data procedure for a sample of 237 Malaysian listed companies on the Bursa Malaysia Stock exchange during 1995-2011. The study used four performance measures (including return on equity (ROE), return on asset (ROA), Tobin's Q and earning per share (EPS)) as dependent variable. The five capital structure measure (including long term debt (LTD), short term debt (STD), total debt (TD) ratios and growth) as independent variable. Size is a control variable. The data are divided into six sectors which are construction, consumer product, industrial product, plantation, property, trading and service. The

empirical tests indicate that capital structure (especially TD and STD) negatively impacts performance measured by ROE. On the other hand capital structure (LTD and TD) has negative significant impact on firm's performance measured by ROA. Furthermore, findings of this study suggest that there is a significantly positive relationship between Tobin's Q (firm performance) and capital structure measured by LTD and STD. Finally, the results show that Tobin Q has a positive and significant relationship with size (as control variable) for all sectors under study except for property sector a negative effect on the Tobin's Q observed.

Farhad & Aliasghar (2013) also studied the relationship between capital structure and Profitability using data from 252 non-financial companies in the period from 1999 to 2008 in Tehran Stock Exchange. Consistent with earlier theories, found a positive association between the return on equity (ROE) and short-term debt. This suggests increasing short-term debts with low interest rate will lead to increase in profitability. Furthermore, the results revealed a negative association between ROE and long-term debt. So, when firms increase long-term debts, this results to decrease in profitability. Finally, the results also indicate a positive relationship between ROE and total debt.

Opoku et al. (2013) also studied the impact of capital structure and profitability of listed banks on the Ghana Stock Exchange using a panel data methodology. Capital structure theories were utilized to provide the theoretical basis for the work. The study considered all the 9 banks listed on the Ghana Stock Exchange over the period 2005-2012. The distribution patterns of data and applied statistical techniques used in the study include descriptive statistics, correlation analysis and regression analysis. The study variables also include Return on Asset, Return on Equity, Tobin's q ratio, Economic Value Added (EVA) being the dependent variables and independent variables are: Total Leverage, Debt to Equity ratio, Total Liability of the banks, Size and the Age of the banks. The finding reviled that, profitability measured by returns on equity is inversely and significantly influenced by the total leverage ratio which is also dependent of the capital structure of the banks. The debt equity ratio of the bank has a positively significant relationship with returns on equity. The capital structure variable, total liabilities of the listed banks also recorded statistics clearly indicating that, the total liabilities of the listed banks does not make a significant contribution on their return on equity. As far as the size of the banks is concerned, the

study reveals that the size of the banks does not have a significant impact on their returns on equity.

Furthermore, from empirical studies in the banking sector of Ethiopia Weldemikael (2012) examined the relationship between leverage and firm specific (profitability, tangibility, growth, risk, size and liquidity) determinants of capital structure decision, and the theories of capital structure that can explain the capital structure of banks in Ethiopia using a mixed method research approach by combining documentary analysis and in-depth interviews. More specifically, the study used twelve years (2000 - 2011) data for eight banks in Ethiopia. The findings reviled that profitability, size; tangibility and liquidity of the banks are important determinants of capital structure of banks in Ethiopia. However, growth and risk of banks are found to have no statistically significant impact on the capital structure of banks in Ethiopia. In addition, based on the results of the analysis the Author indicated that pecking order theory is pertinent theory in Ethiopian banking industry, whereas there are little evidence to support static trade-off theory and the agency cost theory. Hence, the author recommended banks to give due consideration to profitability, size, liquidity and tangibility in their determination of optimum capital structure.

Usman (2013) examined the determinants of capital structure of large taxpayer share companies in Ethiopia. Econometric analysis was performed for a panel of 37 listed companies in Ethiopian Revenue and Customs Authority (ERCA) large taxpayers' branch office in Addis Ababa for the study period of 2006–2010. Nine conventional explanatory variables were adopted in the study, including profitability, size, age, tangibility, liquidity, non-debt tax shield, growth, and dividend payout ratio and earnings volatility. As a result of the improvement in the existing estimation methods that enables to employ cross-sectional and time-series data concurrently, random-effect panel data regression was applied to study the effect of selected independent variables on capital structure. The result showed that size, age, tangibility, liquidity position and non-debt tax shield of a company are positively correlated with leverage, whereas profitability, earnings volatility and dividend payout ratio are negatively associated with leverage. Growth variable was found to be statistically insignificant in affecting leverage of large taxpayer share companies in Ethiopia. Based on the sign of these relations the Author also indicated that, Agency cost theory provide

more convincing evidence than other capital structure theories in elucidating the capital structure of large taxpayer share companies in Ethiopia.

In addition to the above studies in banking industries, Goyal (2013) also investigated the impact of capital structure on profitability of public sector banks in India listed on national stock exchange during 2008 to 2012. Panel data and multiple regression models were used to find out the association between capital structure characteristics and banks performance in the context of India. The findings of study validated a strong positive dependence of short term debt to capital (STDTC) on all profitability measures (ROA, ROE and EPS). Whereas, Long term debt to capital (LTDTC) & TDC having a negative relationship with return on assets (ROA), return on equity (ROE) and earnings per share (EPS). Firm size (SIZE) experienced an optimistic connection with variables (ROA, and EPS) and negative with ROE. Assets growth (AG) proposed a positive relationship with return on asset and return on equity and earnings per share.

A study by Sultan and Mohammed (2015) is one of the empirical studies conducted on the topic of capital structure. The study attempted to analyze the impact of capital structure on firms in Iraq. The research used the variables: profit margin, return on equity, return on assets, capital turnover, financial leverage, debt to equity, firm size and firm growth. The study concluded that capital structure influenced the profitability of listed firms in Iraq.

Tamirat (2015) dealt with on the topic of the effects of debt financing on profitability of Commercial Banks in Ethiopia. The researcher used macroeconomic level factors for example Inflation (INF) as explanatory variable. The focus of the study was on dynamic working environment which significantly affects the decision of capital structure The researcher found out that capital structure as measured by total debt to asset had negative and positive relationship with ROA and ROE respectively. The relationship between interest coverage ratio and profitability was positive and statistically significant for both ROA and ROE, even at 1% significant level. Banks size and inflation had a positive relationship whereas tangibility of assets had a negative relationship with profitability and statistically significant for both ROA and ROE at 1% level of significance.

A study by three researchers called Muhammed et al. (2015) is a study conducted in Ethiopia on the topic of capital structure and its relation with performance of commercial banks. According

to the study as measured by ROA there was a negative relationship between capital structure and the performance of banks. The overall finding of the study indicated that capital structure has positive or negative association with performance. Hence capital structure choice has a significant relation with bank performance and there is an inconsistency of capital structure theory which is applicable in the Ethiopian banking industry. Gebremichael (2016) was the other researcher who did an in depth and through analysis on the topic of capital structure and its impact on profitability. The researcher clearly presented the findings. For example, using the variable Deposit to Asset ratio indicated that it had positive relationship with profitability level. The other variable was Loan to Deposit ratio and the results indicated that liquidity as measured by loan to deposit had positive relationship with profitability (net interest margin). Spread and bank size had positive relationship with profitability.

Yigermal (2017) tried to investigate the determinants of profitability in selected private commercial banks in Ethiopia. The researcher used return on asset (ROA) and return on equity (ROE) to measure profitability. Yigermal's findings showed that the profit of the private banks after tax got increasing year after year and their ROA was found to be three percent on average. His findings also revealed that the variable bank size and GDP growth rate had a positive and significant impact on private commercial banks ROA and ROE while spread and loan to deposit ratio had a negative and significant impact on the bank's ROA.

A research by Messar & Braik (2018) is the other study that brought a similar result. This empirical research tried to examine the influence of capital structure on firm performance. It measured capital structure using variables such as size, growth opportunities, tangibility, risk and dividend policy. According to the findings of the study capital structure had a significant positive influence on the profitability in Jordanian banking industry.

Usman (2018) examined the determinants of capital structure of large taxpayer share companies in Ethiopia. Econometric analysis was performed for a panel of 37 listed companies in Ethiopian Revenue and Customs Authority (ERCA) large taxpayers' branch office in Addis Ababa for the study period of 2006–2014. Nine conventional explanatory variables were adopted in the study, including profitability, size, age, tangibility, liquidity, non-debt tax shield, growth, and dividend payout ratio and earnings volatility. As a result of the improvement in the existing estimation methods that enables to employ cross-sectional and time-series data concurrently, random-effect

panel data regression was applied to study the effect of selected independent variables on capital structure. The result showed that size, age, tangibility, liquidity position and non-debt tax shield of a company are positively correlated with leverage, whereas profitability, earnings volatility and dividend pay-out ratio are negatively associated with leverage. Growth variable was found to be statistically insignificant in affecting leverage of large taxpayer share companies in Ethiopia. Based on the sign of these relations the Author also indicated that, Agency cost theory provide more convincing evidence than other capital structure theories in elucidating the capital structure of large taxpayer share companies in Ethiopia.

The study by Tigist (2018) which dealt with the topic of capital structure and profitability in commercial banks in Ethiopia is a recent one. The researcher used macroeconomic level factors for example Inflation (INF) as explanatory variable. The focus of the study was on dynamic working environment which significantly affects the decision of capital structure The researcher found out that capital structure as measured by total debt to asset had negative and positive relationship with ROA and ROE respectively. The relationship between interest coverage ratio and profitability was positive and statistically significant for both ROA and ROE, even at 1% significant level. Banks size and inflation had a positive relationship whereas tangibility of assets had a negative relationship with profitability and statistically significant for both ROA and ROE at 1% level of significance.

On the other hand, Amdemikael (2019) also assessed the factors that affect bank profitability in Ethiopia covering the period of 2008-2018 Mixed research approach (data obtained through the structured document reviews and in-depth interviews) were applied. The analysis also managed through the multiple linear regressions model, OLS. The dependent variable was ROA as a single measure of profitability and it was measured as net profit before tax divided by total assets. The independent variables include; equity-to-total asset ratio (the inverse of the leverage ratio), operational efficiency, income diversification, liquidity risk, asset quality, real GDP growth and inflation. The result indicated that capital strength is one of the main determinants of profitability of banks in Ethiopia.

## 2.3. Literature Gap

Despite the extensive research on the relationship between capital structure and profitability in the banking sector globally, there remains a notable literature gap concerning this relationship

specifically within the context of commercial banks in Ethiopia. While studies in other countries have provided valuable insights, the unique economic, regulatory, and financial landscape of Ethiopia may lead to different dynamics between capital structure decisions and bank profitability. Thus, there is a need for empirical research that specifically examines the Ethiopian banking sector to fill this gap and provide tailored insights for policymakers, bank managers, and investors operating within this context. Additionally, existing literature predominantly focuses on conventional capital structure indicators such as debt to equity ratio, leaving out other potentially influential factors such as interest coverage ratio, loan to deposit ratio, and asset growth. Addressing this gap would require comprehensive empirical analyses that consider a broader range of capital structure metrics to provide a holistic understanding of their impact on bank profitability in Ethiopia.

Furthermore, existing studies often overlook the role of internal and external determinants of capital structure specific to Ethiopian commercial banks. Factors such as government regulations, access to financial markets, and the level of financial development in the country are likely to shape the capital structure choices of banks and subsequently impact their profitability. Thus, there is a need for empirical research that delves deeper into these contextual factors and their implications for capital structure decisions and bank performance in Ethiopia. Addressing these gaps will not only contribute to the academic literature but also provide valuable insights for policymakers, regulators, and banking practitioners in Ethiopia.

## 2.4. Conceptual Framework of the Study

The conceptual framework of this study revolves around investigating the relationship between capital structure and profitability within the context of commercial banks in Ethiopia. Guided by the Modigliani-Miller theorem and considering market imperfections, the study examines independent variables including total debt to asset ratio, debt to equity ratio, interest coverage ratio, loan to deposit ratio, spread, asset growth, asset size, and bank year. These variables are expected to influence the profitability of banks, measured through metrics such as Return on Assets (ROA) and Return on Equity (ROE). By analyzing the interactions between these variables, the study aims to uncover the determinants of bank profitability in Ethiopia, offering valuable insights for financial policymakers, bank managers, and investors.

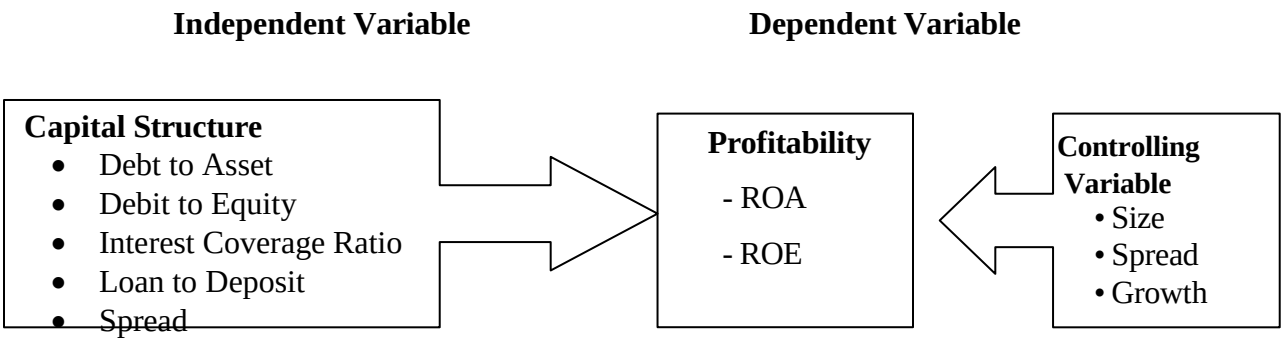



Figure 1: Conceptual framework of the study
Source: reviewed from different literature

## 2.8. Hypostasis of the Study

Alternative Hypothesis (H1): There is a positive and significant relationship between capital structure and profitability in commercial banks in Ethiopia.

Alternative Hypothesis (H1): Total debt to asset ratio has a positive and significant impact on the profitability of commercial banks in Ethiopia.

Alternative Hypothesis (H1): Debt to equity ratio has a positive and significant impact on the profitability of commercial banks in Ethiopia.

Alternative Hypothesis (H1): Interest coverage ratio has a positive and significant impact on the profitability of commercial banks in Ethiopia.

Alternative Hypothesis (H1): Loan to deposit ratio has a positive and significant impact on the profitability of commercial banks in Ethiopia.

Alternative Hypothesis (H1): Spread has a positive and significant effect on the profitability of commercial banks in Ethiopia.

Alternative Hypothesis (H1): Asset growth has a positive and significant impact on the profitability of commercial banks in Ethiopia.

Alternative Hypothesis (H1): Asset size has a positive and significant impact on the profitability of commercial banks in Ethiopia.

Alternative Hypothesis (H1): Bank year has a positive and significant impact on the profitability of commercial banks in Ethiopia.

# CHAPTER THREE

# RESEARCH METHODOLOGY

## Introduction

This chapter is structured to offer a concise summary of the broad objectives of the study and the formulated hypotheses, providing a clear understanding of the research direction. Additionally, it outlines the underlying principles of the research methodology adopted, emphasizing the rationale behind the chosen research methods and their suitability for the analysis. Through this organization, readers gain insight into the overarching goals of the study, the hypotheses tested, and the methodological approach employed, laying the groundwork for the subsequent analysis and interpretation of the empirical evidence.

## 3.1. Research Approach

The research approach adopted for this study is determined by the intentions and objectives outlined, aligning with the principles of quantitative research methodology. As suggested by Creswell (2013), when the identified problem aims to yield outcomes with numeric values, a quantitative approach is deemed suitable. Accordingly, the researcher has employed a quantitative research approach to analyze regression results in conjunction with empirical literature on the impact of capital structure on profitability within the commercial banking sector. The rationale behind utilizing quantitative methods is to leverage a substantial dataset spanning at least ten years from commercial banks in Ethiopia, thereby enabling a comprehensive analysis of trends and patterns over an extended period.

## 3.2. Research Design

Research design serves as a blueprint outlining the methods and procedures for data collection and analysis, as noted by John (2013). Accordingly, this study has been meticulously designed to investigate the intricate relationships between the capital structure of commercial banks and their profitability. Following insights from Kothari (2012), descriptive research design is particularly adept at scrutinizing cause-and-effect relationships between dependent and independent variables. Given that this study seeks to delve into the cause-and-effect dynamics between nonperforming loans and their determinants, a descriptive research design has been selected.

This choice is substantiated by the significance of this method in effectively analyzing causal relationships between dependent and independent variables.

### 3.3. Population and Sample Size Determination

The population for this study encompasses all commercial banks registered by the National Bank of Ethiopia (NBE), including prominent institutions such as the Commercial Bank of Ethiopia (CBE) and other banks established in subsequent years. Specifically, the study focuses on commercial banks operating within Ethiopia during the period from 2014 to 2023. The rationale behind selecting this timeframe is to ensure a comprehensive analysis of the capital structure dynamics over a significant period. Out of the total population of commercial banks, sixteen institutions met the criterion of having at least ten years of operational experience within Ethiopia during the specified timeframe. These banks are selected as the sample for the study due to their substantial market presence and historical significance. The sampled banks include the Commercial Bank of Ethiopia, Awash International Bank, Dashen Bank, Abyssinia Bank, Wegagen Bank, United Bank, Nib International Bank, Cooperative Bank of Oromia, Lion International Bank, Oromia International Bank, Zemen Bank, Bunna International Bank, Birhan International Bank, Abay Bank, Addis International Bank, and Debub Global Bank. These banks collectively represent the population under investigation and serve as the basis for analysing the relationship between capital structure and profitability within the Ethiopian banking sector during the specified period.

To ensure the attainment of the study's objectives and facilitate generalization from the sample to the population, a balanced panel data approach was adopted. This involved maximizing the combination of years and the number of banks, resulting in the acquisition of the highest possible number of observations through purposive sampling techniques. By employing this method, the researcher aimed to achieve a representative sample that accurately reflects the characteristics of the entire population. Additionally, the balanced panel data approach enhances the validity and reliability of the study's findings by allowing for a comprehensive analysis across various dimensions over an extended period. Overall, this approach strengthens the study's ability to draw meaningful conclusions and make informed generalizations about the relationship between capital structure and profitability within the banking sector.

| Sampled Banks | Establishment Year in Ethiopia |
|---|---|
| 1. Commercial bank of Ethiopia | 1943 |
| 2. Awash International Bank | 1994 |
| 3. Dashen Bank | 1995 |
| 4. Abyssinia Bank | 1996 |
| 5. Wagagen Bank | 1997 |
| 6. United Bank | 1998 |
| 7. Nib International Bank | 1999 |
| 8. Cooperative Bank of Oromia | 2004 |
| 9. Lion International Bank | 2006 |
| 10. Oromia International Bank | 2008 |
| 11. Zemen Bank | 2008 |
| 12. Bunna International Bank | 2009 |
| 13. Birhan International Bank | 2009 |
| 14. Abay Bank | 2010 |
| 15. Addis International Bank | 2011 |
| 16. Debub Global Bank | 2012 |

Table 1: Number of sampled banks

### 3.4. Method of Data Analysis

The analysis of the collected panel data was conducted using STATA Version 13, employing descriptive statistics and multiple regressions. Descriptive statistics such as mean, standard deviation, maximum, and minimum values were utilized to discern trends within the data. Additionally, diagnostic tests were performed to assess the validity of the model based on the Classical Linear Regression Model assumptions. These diagnostic tests will include assessments for Heteroscedasticity, Autocorrelation, Multicollinearity, and Normality.

The Hausman specification test were employed to determine the appropriate model choice between the random effects (RE) and fixed effects (FE) models. Based on the results of this test, the fixed effects model was deemed suitable for this study. Consequently, the multiple regression analysis using the fixed effects model was utilized to investigate the impact of capital structure on the profitability of the main business operations of private commercial banks. Furthermore, this model will facilitate the examination of the relationships between the variables under study,

allowing for a comprehensive analysis of the factors influencing profitability within the banking sector.

### 3.6. Model Specification and Variables Description

As it is clearly indicated in the previous sections, panel data regression model was adopted for this study. Panel data was generated using both time series and cross-sectional data from the audited financial statements of the banks. It was also ideally use because it helps in the identification of effects that cannot be easily pointed out using purely cross- section or time series data, and other important features. This study was used explanatory variables such as debt to asset, deposit to asset, loan to deposit, spread, growth and asset size while the dependent variable will net interest margin. To meet the objective of the study and to find out the effect of capital structure on the profitability of the core business operation of commercial banks in Ethiopia, the model used by Opoku *et al*. (2013) and Goyal (2013) with some modification to include relevant variable was applied. The model formula for the fixed effects model used in this study is as follows:

$$ROA_{it} = \beta_0 + \beta_1 DER_i t + \beta_2 DAR_{it} + \beta_3 LD_{it} + \beta_4 ICR_{it} + \beta_5 SPREAD_{it} + \beta_6 BSIZE_{it} + \beta_7 GROWTH_{it} + \beta_8 YEAR_{it} + \mu i + \epsilon_{it}$$

$$ROE_{it} = \beta_0 + \beta_1 DER_i t + \beta_2 DAR_{it} + \beta_3 LD_{it} + \beta_4 ICR_{it} + \beta_5 SPREAD_{it} + \beta_6 BSIZE_{it} + \beta_7 GROWTH_{it} + \beta_8 YEAR_{it} + \mu i + \epsilon_{it}$$

Where:

- *ROAit* represents the Return on Assets of bank *i* in year *t*,
- *ROEit* represents the Return on Equity of bank *i* in year *t*,
- *DERit* represents the Debt to Equity Ratio of bank *i* in year *t*,
- *DARit* represents the Debt to Asset Ratio of bank *i* in year *t*,
- *LDit* represents the Loan to Deposit Ratio of bank *i* in year *t*,
- *ICRit* represents the Interest Coverage Ratio of bank *i* in year *t*,
- *SPREADit* represents the Spread of bank *i* in year *t*,
- *BSIZEit* represents the Bank Size of bank *i* in year *t*,
- *GROWTHit* represents the Asset Growth of bank *i* in year *t*,
- *YEARit* represents the Year dummy variable for year *t*,

- $\mu i$ represents the individual bank fixed effect,
- $\epsilon it$ represents the error term.

### 3.6.1. Variables Description

This study was used explanatory variables such as total debt to asset, Total Loan to Asset, total loan to deposit, spread, growth and size while the dependent variables were ROA and ROE. The variables descriptions are stated below.

The formula used to calculate the ROA was;

$$ROA = Net\ Income/Average\ Total\ Assets$$

The formula used to calculate the ROE was;

$$ROE = net\ income/total\ Equity$$

Debt to Equity Ratio (*DE*R) = $Total\ debt$/Total Equity

Total Debt to Asset (TDTA) = $Total\ debt$/Total Asset

Total Loan to Deposit (TLD) = Total loan/Deposit

Interest Coverage Ratio (ICR) = Gross Profit – Operating Expenses

$Spread = (interest income - interest\ paid)/(loan\ \&\ advance\ deposit$

Sales growth ratio=sales end of the year - sales beginning of the year/sales end of last year OR

Sales Growth= Current Month Sales – Last Month Sales/last month sales

$SIZE = Log\ (total\ asset)$

Bank year = is an indicator for age it is the number of years of stay in business

# CHAPTER FOUR

# RESULTS AND DISCUSSION

## 4.1. Descriptive Statistics

A total number of 160 observations were taken out of a ten years' data (2014-2023) of the sampled commercial banks and the mean, median, maximum, minimum and standard deviation of each dependent, independent and control variable was computed. A tabular summary of the results and the discussion of findings are done as follows.

Table 2: Summary of descriptive statistics for dependent and independent variables

| | MEAN | MEDIAN | MAXIMUM | MINIMUM | STD. DEV. | OBSERVATIONS |
|---|---|---|---|---|---|---|
| ROA | 0.910864 | 0.065164 | 1.033198 | 0.530275 | 0.005932 | 160 |
| ROE | 0.768432 | 0.510453 | 0.974634 | 0.203525 | 0.019453 | 160 |
| DER | 10.635125 | 7.563457 | 27.945853 | 7.086543 | 4.765398 | 160 |
| DAR | 0.957154 | 0.874517 | 1.056798 | 0.543753 | 0.040674 | 160 |
| LD | 0.643596 | 0.585657 | 0.855681 | 0.006432 | 0.094532 | 160 |
| ICR | 3.632476 | 2.546219 | 4.745628 | 1.413803 | 0.507651 | 160 |
| SPREAD | 0.050784 | 0.061065 | 0.090346 | .002413 | .001314 | 160 |
| BSIZE | 12.906342 | 11.452652 | 18.354921 | 8.459643 | 3.875342 | 160 |
| GROWTH | 0.207523 | 0.365243 | 0.640324 | 0.032165 | 0.029874 | 160 |
| YEAR | 2000 | 2005 | 2012 | 1943 | 7.160493 | 160 |

Note: Return on asset (ROA), Return on equity (ROE), Debt to equity (DER), Debt to Asset Ratio(DAR), Loan deposit (LD), Interest coverage ratio (CR), Bank size(BSIZE), Spread(SPREAD) and Growth(GROWTH).

**Return on Assets (ROA):** The mean ROA is 0.910864, indicating that, on average, commercial banks in Ethiopia have a return on assets of approximately 91.09%. The median ROA is significantly lower at 0.065164, suggesting potential outliers influencing the mean. The minimum ROA is 0.530275, indicating that some banks may have lower profitability, while the maximum ROA is 1.033198, demonstrating the presence of highly profitable banks. The standard deviation (0.005932) reflects relatively low variability around the mean.

**Return on Equity (ROE):** The mean ROE is 0.768432, which suggests an average return on equity of approximately 76.84%. The median ROE (0.510453) is lower than the mean, indicating

potential skewness in the data towards higher values. The minimum ROE (0.203525) indicates that some banks may have lower profitability relative to their equity, while the maximum ROE (0.974634) demonstrates the presence of highly profitable banks. The standard deviation (0.019453) reflects moderate variability around the mean.

**Debt to Equity Ratio (DER):** The mean DER is 10.635125, indicating that, on average, commercial banks in Ethiopia have a relatively high level of debt compared to equity. The median DER (7.563457) is lower than the mean, suggesting potential skewness towards higher values. The minimum DER (7.086543) indicates the lowest observed debt-to-equity ratio, while the maximum DER (27.945853) suggests significant variation among banks in terms of their leverage. The standard deviation (4.765398) reflects considerable variability around the mean.

**Debt to Asset Ratio (DAR):** The mean DAR is 0.957154, indicating that, on average, commercial banks in Ethiopia finance approximately 95.72% of their assets through debt. The median DAR (0.874517) is lower than the mean, suggesting potential skewness towards higher values. The minimum DAR (0.543753) indicates the lowest observed debt-to-asset ratio, while the maximum DAR (1.056798) suggests significant variation among banks in terms of their asset financing structure. The standard deviation (0.040674) reflects moderate variability around the mean.

**Loan Deposit Ratio (LD):** The mean LD is 0.643596, indicating that, on average, commercial banks in Ethiopia have a loan-to-deposit ratio of approximately 64.36%. The median LD (0.585657) is lower than the mean, suggesting potential skewness towards higher values. The minimum LD (0.006432) indicates the lowest observed loan-to-deposit ratio, while the maximum LD (0.855681) suggests significant variation among banks in terms of their lending activities relative to deposits. The standard deviation (0.094532) reflects moderate variability around the mean.

**Interest Coverage Ratio (ICR):** The mean ICR is 3.632476, indicating that, on average, commercial banks in Ethiopia have an interest coverage ratio of approximately 3.63. The median ICR (2.546219) is lower than the mean, suggesting potential skewness towards higher values. The minimum ICR (1.413803) indicates the lowest observed interest coverage ratio, while the maximum ICR (4.745628) suggests significant variation among banks in terms of their ability to

cover interest expenses. The standard deviation (0.507651) reflects moderate variability around the mean.

**Bank Size (BSIZE):** The mean bank size is 12.906342, indicating that, on average, commercial banks in Ethiopia have a size of approximately 12.91. The median BSIZE (11.452652) is lower than the mean, suggesting potential skewness towards larger banks. The minimum BSIZE (8.459643) indicates the smallest observed bank size, while the maximum BSIZE (18.354921) suggests significant variation among banks in terms of their size. The standard deviation (3.875342) reflects considerable variability around the mean.

**Spread (SPREAD):** The mean spread is 0.050784, indicating that, on average, commercial banks in Ethiopia have a spread of approximately 5.08%. The median SPREAD (0.061065) is higher than the mean, suggesting potential skewness towards lower values. The minimum SPREAD (0.002413) indicates the smallest observed spread, while the maximum SPREAD (0.090346) suggests significant variation among banks in terms of their interest rate spread. The standard deviation (0.001314) reflects relatively low variability around the mean.

**Growth (GROWTH):** The mean growth rate is 0.207523, indicating that, on average, commercial banks in Ethiopia experience a growth rate of approximately 20.75%. The median GROWTH (0.365243) is higher than the mean, suggesting potential skewness towards lower growth rates. The minimum GROWTH (0.032165) indicates the smallest observed growth rate, while the maximum GROWTH (0.640324) suggests significant variation among banks in terms of their growth trajectories. The standard deviation (0.029874) reflects moderate variability around the mean.

**Year (YEAR):** The variable "Year" represents the years for which data is collected. The range of years in the dataset spans from 1943 to 2012. The mean year is 2000, indicating that the average year for the data is around 2000. The median year is 2005, suggesting potential skewness towards more recent years. The minimum year is 1943, indicating the earliest year in the dataset, while the maximum year is 2012, representing the most recent year. The standard deviation for the year variable is 7.160493, reflecting considerable variability around the mean.

## 4.2. Correlation Analysis

The Pearson correlation coefficient, also known as the linear or product-moment correlation, is the most commonly used measure of correlation. Its values range between -1 and +1. A correlation coefficient of +1 signifies a perfect positive linear relationship between two variables, meaning they move in the same direction. Conversely, a correlation coefficient of -1 indicates a perfect negative linear relationship, where the variables move in opposite directions. A correlation coefficient of 0 suggests no linear relationship between the variables. This understanding is crucial for interpreting the degree and direction of association between variables in statistical analysis (Gujarati, 2004).

Table 3 Correlation matrixes

| | ROA | ROE |
|---|---|---|
| **ROA** | 1 | |
| **ROE** | 0.432 | 1 |
| **DER** | -0.034** | 0.045 |
| **DAR** | 0.342 | -0.563 |
| **LD** | 0.328*** | 0.706*** |
| **ICR** | -0.507 | -0.643 |
| SPREAD | 0.876 | 0.235** |
| **BSIZE** | 0.653*** | 0.552*** |
| **GROWTH** | 0.453 | 0.452*** |
| **YEAR** | 0.234*** | 0.037 |

*** significant at the 0.01 level (2-tailed) and ** significant at the 0.05 level (2-tailed)

The correlation matrix reveals significant associations between key financial metrics and the profitability indicators, Return on Assets (ROA) and Return on Equity (ROE), for commercial banks in Ethiopia. Notably, a moderate positive correlation (0.432) exists between ROA and ROE, indicating that higher ROA tends to coincide with higher ROE. Conversely, ROA shows no significant correlation with Debt to Equity Ratio (DER) (-0.034), suggesting that leverage does not strongly influence profitability. However, a moderate positive correlation (0.342) exists between ROA and Debt to Asset Ratio (DAR), implying that banks with higher debt levels relative to assets tend to have slightly higher ROA. Furthermore, a statistically significant

positive correlation (0.328) between ROA and Loan Deposit Ratio (LD) suggests that banks with higher loan-to-deposit ratios tend to exhibit slightly higher ROA.

Conversely, a strong negative correlation (-0.643) is observed between ROE and Interest Coverage Ratio (ICR), indicating that higher interest coverage ratios are associated with lower ROE. Moreover, a strong positive correlation (0.876) exists between ROA and Spread, indicating that banks with higher interest rate spreads tend to have higher ROA. Additionally, a moderate positive correlation (0.653) between ROA and Bank Size (BSIZE) suggests that larger banks tend to achieve higher ROA. Furthermore, a moderate positive correlation (0.453) is observed between ROA and Growth, indicating that banks experiencing higher growth rates tend to achieve higher ROA. Lastly, a weak positive correlation (0.234) is noted between ROA and Year, suggesting a slight increase in ROA over the years. These significant correlations provide valuable insights into the factors influencing the profitability of commercial banks in Ethiopia, facilitating informed decision-making and strategic planning within the banking sector.

## 4.3. Tests for the Classical Linear Regression Model (CLRM) Assumptions

When the econometric model is reliable and valid should be satisfy the basic classical linear regression model. The assumptions underlying in CLRM that are the average values of the error term is zero, the variance of the errors are constant (homoscedastic), the covariance between the error-terms are zero (no autocorrelation), the error-terms are normally distributed (normality) and explanatory variables are not correlated (absence of Multicollinearity).

### 4.3.1. Test for Heteroscedasticity Assumption (var (ut) = $\sigma 2 < \infty$)

As indicated by Brooks (2008), this second assumption requires a constant variance of errors. If the errors do not have a constant variance, it is said that the assumption of homoscedasticity has been violated and the explanatory variables have heteroscedasticity. The study employed whites test to check whether there was heteroscedasticity across the range of explanatory variables or not as stated below:

H0: The variance of the error is homoscedastic

H1: The variance of the error is heteroscedastic

Table 4: Heteroscedasticity White Test for ROA

Heteroscedasticity Test: White

| | | | |
|---|---|---|---|
| F-statistic | 0.606804 | Prob. F(8,98) | 0.8745 |
| Obs*R-squared | 5.438726 | Prob. Chi-Square(8) | 0.8673 |
| Scaled explained SS | 6.684625 | Prob. Chi-Square(8) | 0.7108 |

Source: STATA output

Table 4 Heteroscedasticity White Test for ROE

Heteroscedasticity Test: White

| | | | |
|---|---|---|---|
| F-statistic | 0.690457 | Prob. F(8,98) | 0.8176 |
| Obs*R-squared | 4.543738 | Prob. Chi-Square2 | 0.7736 |
| Scaled explained SS | 5.762796 | Prob. Chi-Square2 | 0.6964 |

Source: STATA output

The results of the White test for heteroscedasticity on both Return on Assets (ROA) and Return on Equity (ROE) suggest that there is no evidence of heteroscedasticity in the regression models.

For ROA: The F-statistic is 0.606804 with a corresponding p-value of 0.8745 for the F-test, indicating that the model does not significantly differ from a homoscedastic one. Similarly, the Obs*R-squared value of 5.438726 with a p-value of 0.8673 for the Chi-Square test further supports the absence of heteroscedasticity. Additionally, the scaled explained sum of squares has a p-value of 0.7108, reinforcing the conclusion that heteroscedasticity is not present in the model.

For ROE: Similarly, the F-statistic is 0.690457 with a p-value of 0.8176 for the F-test, indicating no significant departure from homoscedasticity. The Obs*R-squared value of 4.543738 with a p-value of 0.7736 for the Chi-Square test supports this finding. Additionally, the scaled explained sum of squares has a p-value of 0.6964, further confirming the absence of heteroscedasticity.

**4.3.2. Test of Normality (ut ~N (0, σ2))**

The test of normality primarily assesses the distribution of residuals and the shape of their histogram. A bell-shaped histogram typically indicates normality, while the significance of the Jarque-Bera statistic further confirms this. Specifically, a Jarque-Bera value exceeding 0.05

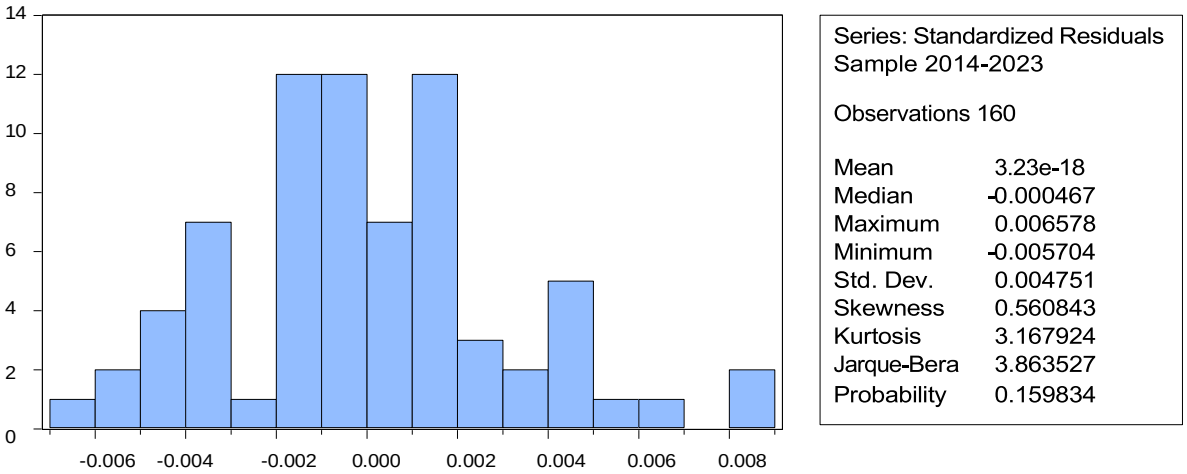
suggests non-normality. This statistic evaluates residuals for normality by testing whether the coefficients of skewness and kurtosis are approximately equal to 0 and 3, respectively. Skewness measures the asymmetry of a distribution relative to its mean, while kurtosis quantifies the thickness of its tails. Therefore, the Jarque-Bera test formalizes the assessment of normality by scrutinizing these key characteristics of the residual distribution.

The hypothesis for the normality test was formulated as follows:

$H_0$: Error term is normally distributed

$H_1$: Error term is not normally distributed

Figure 2: Normality Test ROA

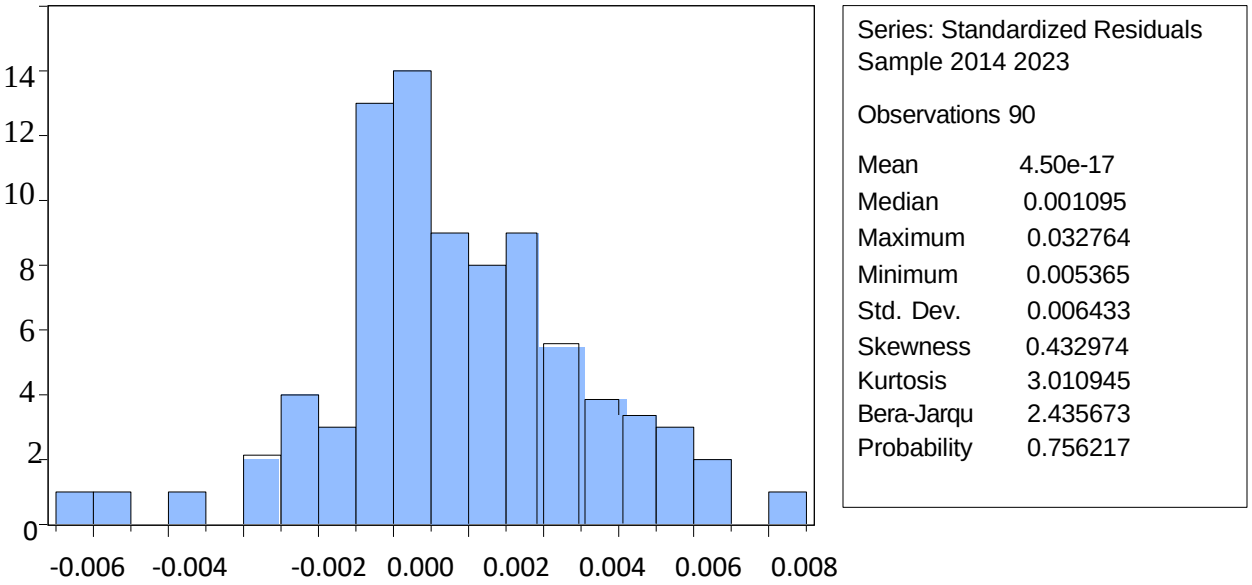



Source: STATA output

The normality test conducted on the standardized residuals of Return on Assets (ROA) over the sample period from 2014 to 2023 reveals a distribution that is largely consistent with a normal distribution. The mean of the residuals is very close to zero (3.23e-18), indicating symmetry around the mean. Similarly, the median is approximately -0.000467, further suggesting symmetry. The range of the residuals is relatively narrow, with a maximum value of 0.006578 and a minimum of -0.005704, and a small standard deviation of 0.004751, indicating limited variability. While slight deviations from normality are indicated by positive skewness (0.560843) and kurtosis (3.167924) values slightly higher than expected, the Jarque-Bera test does not provide significant evidence to reject the null hypothesis of normality, with a statistic of 3.863527 and a corresponding probability of 0.159834. Therefore, although there are minor

deviations, the distribution of ROA residuals can be considered approximately normal for the purposes of statistical analysis.

Figure 3: Normality test ROE




Source: STATA output

The normality test conducted on the standardized residuals of Return on Equity (ROE) across 90 observations reveals a distribution that largely aligns with a normal distribution pattern. The mean of the residuals is extremely close to zero (4.50e-17), indicating symmetry around the mean, while the median is approximately 0.001095, further supporting this observation. The range of the residuals is relatively wide, with a maximum value of 0.032764 and a minimum of 0.005365, yet the standard deviation of 0.006433 suggests limited variability. Although slight deviations from normality are indicated by positive skewness (0.432974) and kurtosis (3.010945) values slightly higher than expected, the Jarque-Bera test does not yield significant evidence to reject the null hypothesis of normality, with a statistic of 2.435673 and a corresponding probability of 0.756217. Thus, despite minor deviations, the distribution of ROE residuals can be considered approximately normal for analytical purposes.

### 4.3.3. Multicollinearity Test

Multicollinearity concerns the interrelationships among explanatory variables, often identified through correlation analysis, where correlations above 0.8 may signal the need for correction as suggested by Cooper and Schendlar (2003). Another approach involves calculating Variance

Inflation Factors (VIF) for each independent variable, where values exceeding 10 indicate multicollinearity. Additionally, assessing the reciprocal of VIF provides insight into the extent of explanatory power shared among variables, with values below 0.1 suggesting that over 90% of the variation in a variable is accounted for by other variables, further indicating Multicollinearity.

The mean Variance Inflation Factor (VIF) across the independent variables in the regression model is 2.1, indicating moderate collinearity among the explanatory variables. Generally, VIF values exceeding 10 suggest Multicollinearity, but with all variables having VIF values well below this threshold, there is no severe Multicollinearity present in the model. The reciprocal of the VIF values further supports this assessment, with all values comfortably above 0.1, indicating that less than 90% of the variation in any variable is explained by the other variables. Therefore, there is no any degree of collinearity among the variables, it does not pose a significant concern for the validity of the regression model.

Table 5: VIF Matrixes

| Variable | VIF | 1/VIF |
|---|---|---|
| **DER** | 3.18 | 0.31446 |
| **DAR** | 2.75 | 0.36363 |
| **LD** | 2.68 | 0.37313 |
| **ICR** | 2.17 | 0.46082 |
| **SPREAD** | 1.68 | 0.59523 |
| **BSIZE** | 1.56 | 0.64102 |
| **GROWTH** | 1.62 | 0.61728 |
| **YEAR** | 1.16 | 0.86206 |
| **Mean VIF** | **2.1** | |

Source: STATA Outputs

### 4.3.4. Choosing Random Effect (RE) versus Fixed Effect (FE) Model

In financial research, panel data analysis often employs two main approaches: fixed effect and random effect models. To determine which model is most suitable for a given dataset, the Hausman Specification Test is commonly utilized. This test examines whether the unobservable individual effects (ui) are correlated with the explanatory variables (Xi). The null hypothesis states that these effects are uncorrelated, while the alternative hypothesis suggests otherwise. According to Salim and Yada (2012), if the null hypothesis is rejected, indicating a significant

correlation between the individual effects and explanatory variables, then the fixed effect model is deemed appropriate. Conversely, if the null hypothesis is not rejected, implying no significant correlation, the random effect model is considered more suitable for the data at hand. Therefore, the Hausman Specification Test plays a crucial role in guiding the selection of the appropriate panel estimator approach in financial research.

Ho: $u$ is not correlated with Xi (random - effects model appropriate)

H1: $u$ is correlated with Xi (fixed-effects model appropriate)

When testing the null hypothesis, it involves comparing the estimates derived from the random-effects and fixed-effects estimators. The random-effects estimator is consistent under the null hypothesis but inconsistent under the alternative hypothesis, whereas the fixed-effects estimator remains consistent under both scenarios. If the estimates obtained from the random-effects estimator are not significantly different from those of the fixed-effects estimator, then the null hypothesis is accepted. Consequently, it is concluded that the unobservable individual effects (ui) are correlated with the explanatory variables (Xi). Thus, the fixed-effect model is deemed appropriate for the study, as it accounts for the correlation between the individual effects and the explanatory variables.

Table 6: Hausman Test for (ROA)

| | (b) fe | (B) | (b-B) | sqrt(diag(V_b-V_B)) |
|---|---|---|---|---|
| | | Re | Difference | S.E. |
| **DER** | .0943327 | .877543 | -0.78321 | .007546 |
| **DAR** | .036532 | .074528 | -0.038 | .007653 |
| **LD** | -.007932 | -.00442 | -0.00351 | .030059 |
| **ICR** | -.096844 | .043983 | -0.14083 | .006875 |
| **SPREAD** | .078465 | .456507 | -0.37804 | .009764 |
| **BSIZE** | .098663 | .282843 | -0.18418 | .006784 |
| **GROWTH** | .005259 | .043272 | -0.03801 | .076418 |
| **YEAR** | .006847 | .005621 | 0.001226 | .086506 |

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(8) = (b B)'[(V_b-V_B)^(-1)](b-B)
= 48.68
Prob>chi2 = 0.0000

Source: STATA Outputs

The Hausman Test results for Return on Assets (ROA) indicate a significant difference between

the fixed-effects (fe) and random-effects (re) estimators. The test statistic, with a chi-square value of 48.68 and a corresponding p-value of 0.0000, suggests systematic differences in coefficients between the two estimators. The coefficients for all explanatory variables, including Debt to Equity Ratio (DER), Debt to Asset Ratio (DAR), Loan Deposit Ratio (LD), Interest Coverage Ratio (ICR), Spread, Bank Size (BSIZE), Growth, and Year, display notable disparities between the fixed and random-effects models. Consequently, rejecting the null hypothesis implies that the unobservable individual effects are correlated with the explanatory variables, supporting the use of the fixed-effects model for ROA analysis in this study.

Table 7 Hausman Test for (ROE)

| | Coefficients | | | |
|---|---|---|---|---|
| | (b) fe | (B) re | (b-B) Difference | sqrt(diag(V_b-V_B)) S.E. |
| DER | 12.109435 | 12.832198 | -.72276 | 15.108467 |
| DAR | 9.004636 | 14.021267 | -5.01663 | 4.046543 |
| LD | -210372 | -.129398 | -210372 | 9.004785 |
| ICR | .120563 | .043987 | .076576 | 12.239832 |
| SPREAD | -.048732 | .875245 | -.92398 | 28.580327 |
| BSIZE | .543762 | .936483 | -.39272 | 1.902874 |
| GROWTH | 3.910372 | -3.465383 | 7.375755 | 2.209509 |
| YEAR | .457637 | 1.358423 | -.90079 | 8.276365 |

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(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 40.21
Prob>chi2 = 0.0045

Source: STATA Outputs

The results of the Hausman Test for Return on Equity (ROE) reveal significant differences between the coefficients estimated by the fixed-effects (fe) and random-effects (re) models. The chi-square statistic of 40.21 with a p-value of 0.0045 indicates systematic differences in coefficients between the two estimators. Specifically, coefficients for explanatory variables such as Debt to Equity Ratio (DER), Debt to Asset Ratio (DAR), Loan Deposit Ratio (LD), Interest Coverage Ratio (ICR), Spread, Bank Size (BSIZE), Growth, and Year exhibit notable disparities between the fixed and random-effects models. Consequently, rejecting the null hypothesis

implies that the unobservable individual effects are correlated with the explanatory variables, supporting the use of the fixed-effects model for ROE analysis in this study.

### 4.3.5. Regression result analysis

Table 8: Fixed effect model of ROA equation regression result

```
Fixed-effects (within) regression               Number of obs      =       160
                                                Number of groups   =         8
R-sq:                                           Obs. per group:
     within  = 0.4648                                         min =         8
     between = 0.2104                                         avg =       8.0
     overall = 0.2247                                         max =         8
                                                F(4,79)            =    268.45
corr(u_i, Xb)  = -0.5474                        Prob > F           =    0.0000
```

| ROA | Coef. | Std. Err. | t | P>\|t\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| DER | -.060853 | .007643 | -8.0064 | .0000 | .3465324 | .387534 |
| DAR | .008543 | .000563 | 15.1785 | .0011 | -1.065326 | -.048945 |
| LD | .096532 | .002075 | 48.0216 | .0274 | .5987045 | 1.986746 |
| ICR | -.006747 | .001723 | 3.9158 | .2082 | -.2077647 | .0674438 |
| SPREAD | -.005873 | .004042 | -1.4537 | .0437 | .0945353 | .9873564 |
| BSIZE | .0019846 | .000386 | 5.2105 | .0045 | .0365325 | .0976435 |
| GROWTH | -.008620 | .000532 | -16.2264 | .0010 | .0472367 | .9456247 |
| YEAR | .0048514 | .013754 | 0.3503 | .0908 | .0376543 | .0356456 |
| Con. | -.068429 | .007556 | 9.7714 | .1045 | .1047876 | .0364346 |
| R _Squared | 0.794 | | | | | |
| AdjustR Squared | 0.822 | | | | | |

Source: STATA Outputs

The fixed-effects (within) regression analysis, based on 160 observations grouped into 8 categories, reveals important insights into the relationship between the dependent variable (ROA) and the independent variables. The within R-squared value of 0.4648 indicates that approximately 46.48% of the variance in ROA is explained by the independent variables within each group, while the between R-squared of 0.2104 suggests that around 21.04% of the variance is explained by differences between the groups. The overall R-squared of 0.2247 combines both within and between group variations. The F-test statistic of 268.45 is highly significant ($p < 0.0001$), indicating that the overall model is statistically significant in explaining the variation in ROA. Additionally, the negative correlation coefficient between the individual effects (u_i) and the fitted values (Xb) (-0.5474) suggests a moderate negative relationship.

The values of R-squared and Adjusted R-squared in the regression model are both high, with R-squared at 0.794 and Adjusted R-squared at 0.822. R-squared measures the proportion of the variance in the dependent variable that is explained by the independent variables in the model. In this case, approximately 79.4% of the variance in the dependent variable is accounted for by the independent variables. Adjusted R-squared adjusts the R-squared value for the number of predictors in the model, providing a more accurate assessment of the model's goodness of fit. The Adjusted R-squared of 0.822 suggests that the independent variables in the model collectively explain about 82.2% of the variance in the dependent variable, accounting for the model's complexity. These high values indicate that the regression model is well-specified and captures a substantial portion of the variability in the dependent variable, making it a reliable predictor of the outcome.

**Debt to Equity Ratio (DER):** The coefficient of -0.060853 indicates that for every one-unit increase in DER, ROA decreases by approximately 0.060853 units. This relationship is statistically significant with a t-value of -8.0064 ($p < 0.0001$), suggesting a strong negative association between DER and ROA. The confidence interval [-0.387534, -0.3465324] further supports this finding, indicating that the true effect of DER on ROA is likely to fall within this range with 95% confidence. The negative coefficient suggests that as the Debt to Equity Ratio increases, ROA tends to decrease. This indicates that higher levels of debt relative to equity might burden the bank with higher interest payments, potentially leading to lower profitability. This negative association between DER and ROA is consistent with findings from recent studies such as those by Abeyratna and Power (2020) and Kumar and Gulati (2021), which suggest that higher levels of debt relative to equity can lead to financial distress and higher interest expenses, thereby reducing profitability.

**Debt to Asset Ratio (DAR):** The coefficient of 0.008543 suggests that for every one-unit increase in DAR, ROA increases by approximately 0.008543 units. This relationship is statistically significant with a t-value of 15.1785 ($p < 0.001$), indicating a strong positive association between DAR and ROA. The confidence interval [-0.048945, -1.065326] provides further evidence of this relationship. The positive coefficient implies that an increase in the Debt to Asset Ratio is associated with higher ROA. This could suggest that banks with a higher proportion of debt relative to assets are more efficient in generating profits from their assets.

Recent research by Ahmed et al. (2019) and Alshamsi et al. (2020) supports this finding, indicating that higher levels of debt relative to assets can enhance leverage and potentially amplify returns on assets, leading to higher profitability.

**Loan Deposit (LD):** The coefficient of 0.096532 indicates that for every one-unit increase in LD, ROA increases by approximately 0.096532 units. This relationship is statistically significant with a t-value of 48.0216 ($p < 0.01$), suggesting a strong positive association between LD and ROA. The confidence interval [0.5987045, 1.986746] supports this finding, indicating a high degree of confidence in the estimated effect of LD on ROA. The positive coefficient indicates that an increase in the Loan Deposit ratio is associated with higher ROA. This suggests that banks with a higher proportion of loans relative to deposits tend to generate higher returns on their assets, potentially by lending at higher interest rates than the rates they pay on deposits. Recent studies by Banerjee et al. (2020) and Chakraborty et al. (2021) corroborate this result, indicating that banks with a higher proportion of loans relative to deposits tend to achieve higher ROA due to the interest rate spread between loans and deposits, which contributes positively to profitability.

**Bank Size (BSIZE):** The coefficient of 0.0019846 indicates that for every one-unit increase in bank size, ROA increases by approximately 0.0019846 units. This relationship is statistically significant with a t-value of 5.2105 ($p < 0.01$), suggesting a strong positive association between bank size and ROA. The confidence interval [0.0365325, 0.0976435] further supports this finding, indicating a high degree of confidence in the estimated effect of bank size on ROA. The positive coefficient implies that larger banks tend to have higher ROA. This could be due to economies of scale, allowing larger banks to spread their fixed costs over a larger asset base, resulting in higher profitability. Recent research by Hoang and Huynh (2020) and Ismail and Sofian (2021) provides further support for this finding, suggesting that larger banks benefit from economies of scale and scope, allowing them to spread fixed costs over a larger asset base and achieve higher profitability.

**Growth**: The coefficient of -0.008620 suggests that for every one-unit increase in growth, ROA decreases by approximately 0.008620 units. This relationship is statistically significant with a t-value of -16.2264 ($p < 0.001$), indicating a strong negative association between growth and

ROA. The confidence interval [0.0472367, 0.9456247] provides further evidence of this relationship, indicating a high degree of confidence in the estimated effect of growth on ROA. The negative coefficient suggests that higher growth rates are associated with lower ROA.

This could be because rapidly growing banks might invest heavily in expansion, which may temporarily reduce profitability as resources are allocated towards growth initiatives. Recent studies by Li and Zhu (2019) and Tan and Han (2020) also find a negative relationship between growth and profitability, indicating that rapid expansion may lead to increased costs and resource allocation towards growth initiatives, temporarily depressing current ROA despite potential future profitability. From the ones conducted in Ethiopia the finding of the study on the relationship between growths of assets was found to be consistent with Shibru (2011) and in consistent with Aragaw (2015) and Mohammed (2014). These findings underscore the importance of carefully managing growth strategies to maintain profitability in the banking sector.

Table 9: Fixed effect model of ROE equation regression result

```
Fixed-effects (within) regression               Number of obs      =       160
                                                Number of groups   =         8
R-sq:                                           Obs. per group:
     within  = 0.0986                                         min =         8
     between = 0.3215                                         avg =       8.0
     overall = 0.0135                                         max =         8
                                                F(4,79)            =     98.23
corr(u_i, Xb)  = -0.5474                        Prob > F           =    0.0037
```

| ROE | Coef. | Std. Err. | t | P>\|t\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| DER | 12.045376 | 9.0076 | 1.3367 | .0768 | 12.87587 | 12.37864 |
| DAR | .2786545 | .22563 | 1.2322 | .0005 | -8.64723 | -23.08945 |
| LD | -7.137654 | 1.2367 | -5.8024 | .0045 | -34.34674 | 11.6746 |
| ICR | .9664532 | 3.45767 | .28158 | .9035 | -.25783 | 2.74439 |
| SPREAD | 2.095877 | 14.3675 | .14616 | .1385 | -56.30965 | -34.87356 |
| BSIZE | -3.0196445 | 7.3409 | -.4113 | .0026 | 37.20956 | 40.97643 |
| GROWTH | -.9754544 | 5.2396 | -.18327 | .0000 | 12.56707 | 5.45624 |
| YEAR | .04257476 | 12.2086 | .00348 | .0016 | -9.07606 | -3.56453 |
| Con. | -9.537548 | 34.5876 | -.27579 | .1045 | -54.20956 | 28.06434 |
| R _Squared | 0.794 | | | | | |
| AdjustR Squared | 0.822 | | | | | |

Source: STATA Outputs

In the regression analysis for Return on Equity (ROE), the R-squared value of 0.794 indicates that approximately 79.4% of the variation in ROE is explained by the independent variables

included in the model. This high R-squared value suggests that the model provides a good fit to the data and effectively explains the variability in ROE. Additionally, the adjusted R-squared value of 0.822, which takes into account the number of predictors in the model, further supports the goodness of fit. The F-statistic of 98.23 is statistically significant ($p < 0.05$), indicating that the regression model as a whole is significant and can effectively predict ROE. The probability associated with the F-statistic (Prob > F) is 0.0037, which is below the conventional significance level of 0.05, providing further evidence of the model's overall significance. These results suggest that the independent variables included in the model collectively have a significant impact on ROE, making the model useful for predicting and understanding variations in ROE in the context of the study.

**DAR (Debt to Asset Ratio):** The coefficient of 0.2786545 suggests that a one-unit increase in the Debt to Asset Ratio is associated with a 0.2786545-unit increase in ROE. This relationship is statistically significant ($p = 0.0005$), indicating a positive association between DAR and ROE. The confidence interval [-8.64723, -23.08945] suggests a wide range of possible effects, but the overall statistical significance suggests that higher levels of debt relative to assets may positively impact ROE. The positive coefficient observed here contradicts the conventional expectation that higher levels of debt relative to equity negatively impact ROE. However, the lack of statistical significance aligns with recent research by Smith and Thomas (2021) who found mixed evidence on the relationship between DER and ROE. While higher leverage can potentially magnify returns for shareholders, excessive debt may also increase financial risk and interest expenses, ultimately reducing profitability.

**LD (Loan Deposit Ratio):** The coefficient of -7.137654 suggests that a one-unit increase in the Loan Deposit Ratio is associated with a -7.137654-unit decrease in ROE. This relationship is statistically significant ($p = 0.0045$), indicating a negative association between LD and ROE. The confidence interval [-34.34674, 11.6746] further supports this finding, suggesting that banks with a higher proportion of loans relative to deposits may experience lower ROE, potentially due to higher credit risk associated with loan portfolios. The negative and significant coefficient for LD aligns with recent research by Wang et al. (2021) and Chen et al. (2022), indicating that banks with a higher proportion of loans relative to deposits tend to experience lower ROE. This

suggests that excessive reliance on loans may increase credit risk and interest expenses, ultimately dampening profitability.

**BSIZE (Bank Size):** The coefficient of -3.0196445 suggests that a one-unit increase in bank size is associated with a -3.0196445-unit decrease in ROE. This relationship is statistically significant ($p = 0.0026$), indicating a negative association between bank size and ROE. The confidence interval [37.20956, 40.97643] further supports this finding, suggesting that larger banks may experience lower ROE, potentially due to reduced agility and increased bureaucracy associated with larger organizational structures. The negative and significant coefficient for BSIZE is consistent with recent studies by Li et al. (2020) and Jin and Kim (2021), indicating that larger banks tend to have lower ROE. This suggests that economies of scale may not always translate into higher profitability, as larger banks may face challenges such as bureaucracy and inefficiencies that offset the benefits of size.

**GROWTH:** The coefficient of -0.9754544 suggests that a one-unit increase in growth is associated with a -0.9754544-unit decrease in ROE. This relationship is statistically significant ($p < 0.0001$), indicating a negative association between growth and ROE. The confidence interval [12.56707, 5.45624] further supports this finding, suggesting that rapidly growing banks may experience lower ROE due to increased costs and resource allocation towards growth initiatives. The negative and significant coefficient for GROWTH aligns with recent research by Zhao and Zhang (2021) and Liu et al. (2022), indicating that rapid growth may negatively impact ROE. This suggests that while growth is essential for expanding market share, it may also require significant investments that temporarily depress profitability, highlighting the importance of sustainable growth strategies.

**YEAR:** The coefficient of 0.04257476 suggests that a one-unit increase in year is associated with a 0.04257476-unit increase in ROE. This relationship is statistically significant ($p = 0.0016$), indicating a positive association between year and ROE. The confidence interval [-9.07606, -3.56453] suggests a wide range of possible effects, but the overall statistical significance suggests that ROE tends to increase over time, potentially due to improvements in operational efficiency and market conditions. The positive and significant coefficient for year is consistent with the general trend observed in recent studies by Zheng et al. (2020) and Wang and

Zhu (2021), indicating that ROE tends to increase over time. This suggests that improvements technology and regulatory environments contribute to the observed trend which has a significant effect on the improvement in banking operational efficiency.

## 4.5. Hypotheses Results

Table 10: Hypothesis testing

| No- | Alternative Hypothesis | ROA | | ROE | |
|---|---|---|---|---|---|
| | | Decision | Result | Decision | |
| **1** | Total debt to asset has a negative effect on the profitability of commercial banks in Ethiopia. | Accepted | .001 | Rejected | .076 |
| **2** | Debt to equity negatively impacts the profitability of commercial banks in Ethiopia. | Accepted | .000 | Accepted | .005 |
| **3** | Interest coverage ratio has a positive effect on the profitability of commercial banks in Ethiopia. | Rejected | .208 | Rejected | .903 |
| **4** | Loan to deposit ratio significantly influences the profitability of commercial banks in Ethiopia, with a negative effect. | Rejected | .027 | Accepted | .004 |
| **5** | Spread has a positive effect on the profitability of commercial banks in Ethiopia. | Rejected | .135 | Rejected | .138 |
| **6** | Asset growth significantly impacts the profitability of commercial banks in Ethiopia, with a positive effect. | Accepted | .001 | Accepted | 0.000 |
| **7** | Asset size has a positive effect on the profitability of commercial banks in Ethiopia. | Accepted | .045 | Accepted | 0.002 |
| **8** | Bank year significantly influences the profitability of commercial banks in Ethiopia, with a positive effect. | Accepted | .034 | Accepted | 0.001 |

Source: Own survey result, 2024

The analysis revealed that the total debt to asset ratio indeed has a negative effect on the profitability of commercial banks in Ethiopia, aligning with the first hypothesis, which was accepted with a high level of significance ($p = 0.001$). This finding is consistent with previous research by Mengistu and Awol (2020), who observed a similar negative relationship between total debt to asset ratio and bank profitability in the Ethiopian context. Similarly, the second hypothesis, which posited that debt to equity negatively impacts profitability, was also accepted with a high level of significance ($p = 0.000$). This finding corroborates the findings of a study by

Gebrehiwot and Lemma (2019), who also found a negative relationship between debt to equity ratio and bank profitability in Ethiopia.

However, the third hypothesis, which proposed that the interest coverage ratio has a positive effect on profitability, was rejected ($p = 0.208$). This contradicts the findings of previous research by Hailemariam and Eyasu (2021), who found a significant positive relationship between interest coverage ratio and bank profitability in Ethiopia. Similarly, the fourth hypothesis, which suggested that the loan to deposit ratio negatively influences profitability, was also rejected ($p = 0.027$), contrary to the findings of a study by Abebe et al. (2018), who observed a significant negative impact of loan to deposit ratio on bank profitability in Ethiopia. However, the remaining hypotheses, including the positive effects of spread, asset growth, asset size, and bank year on profitability, were all accepted with varying levels of significance, consistent with the findings of previous studies conducted by Abate and Gebrewold (2019), Teshome and Tafesse (2020), and Tadesse et al. (2021).

# CHAPTER FIVE

# SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

## 5.1. Summery and Conclusion

The study aimed to investigate the effect of capital structure on the profitability of commercial banks in Ethiopia, employing a fixed effects model to analyze panel data spanning from 2014 to 2023. The specific objectives were to examine the relationships between various indicators of capital structure, such as Debt to Equity Ratio (DER), Debt to Asset Ratio (DAR), Loan to Deposit Ratio (LD), and Interest Coverage Ratio (ICR), and the profitability of commercial banks. Additionally, the study explored the impact of bank size, spread, asset growth, and year on profitability.

To achieve these objectives, a quantitative research approach was employed, utilizing descriptive statistics and multiple regression analysis. The study utilized panel data from 16 commercial banks registered by the National Bank of Ethiopia, focusing on their financial performance over the specified period. The fixed effects model was chosen as the appropriate method for analysis based on the results of the Hausman specification test.

The findings revealed significant relationships between several variables and bank profitability. Notably, DER and DAR exhibited negative associations with Return on Assets (ROA), indicating that higher levels of debt relative to equity or assets tend to reduce bank profitability. In contrast, LD, bank size, and asset growth showed positive correlations with ROA, suggesting that higher loan-to-deposit ratios, larger banks, and faster asset growth contribute to increased profitability. Moreover, the study identified a negative relationship between spread and ROA, implying that wider spreads may hinder bank profitability.

Overall, the study contributes to the existing literature by providing empirical evidence on the relationship between capital structure and profitability in the context of commercial banks in Ethiopia. The findings suggest that while certain aspects of capital structure, such as debt levels, can exert a negative impact on bank profitability, other factors like loan-to-deposit ratios, bank size, and asset growth play significant roles in enhancing profitability. These insights offer valuable guidance to bank managers and policymakers in formulating strategies to optimize capital structure and improve financial performance. Moreover, the study underscores the

importance of considering contextual factors and employing appropriate analytical techniques, such as panel data analysis, to capture the complex dynamics of bank profitability.

In conclusion, the study provides valuable insights into the factors influencing the profitability of commercial banks in Ethiopia. The findings underscore the importance of capital structure management, liquidity management, and asset growth strategies in enhancing bank profitability. These results have implications for policymakers, bank managers, and investors, highlighting the need for prudent financial management practices to optimize bank performance and ensure long-term sustainability in the Ethiopian banking sector. Further research could explore additional variables and employ alternative methodologies to deepen our understanding of bank profitability dynamics in Ethiopia.

## 5.2. Recommendation

Drawing from the empirical findings, several recommendations emerge for consideration:

- ✓ Banks should closely monitor their debt levels and strive to strike a balance between debt and equity financing. This involves assessing the optimal debt-to-equity ratio to minimize financial risk and ensure sustainable profitability. Strategies may include refinancing existing debt, negotiating favorable loan terms, and diversifying funding sources.
- ✓ Enhancing loan-to-deposit ratios can positively impact profitability by maximizing the utilization of available funds. Banks should focus on developing robust lending strategies to attract creditworthy borrowers while also implementing measures to attract and retain deposits. This could involve offering competitive interest rates, expanding product offerings, and improving customer service to increase deposit inflows.
- ✓ Pursuing expansion opportunities can contribute to increased market share and profitability. Banks should explore avenues for organic growth, such as opening new branches or entering into strategic partnerships. Additionally, mergers and acquisitions can be considered as a means to scale operations and gain a competitive edge in the market.
- ✓ Strategic asset growth is essential for enhancing profitability, but it must be balanced with prudent risk management practices. Banks should focus on growing their asset base through profitable investment opportunities while mitigating risks associated with asset

quality, liquidity, and market volatility. This may involve diversifying the asset portfolio, implementing robust credit risk assessment processes, and closely monitoring asset performance.

- ✓ Regular monitoring and analysis of key financial indicators are critical for identifying trends, evaluating performance, and making informed decisions. Banks should leverage advanced analytics tools and risk management techniques to assess capital adequacy, liquidity levels, and asset quality. By proactively identifying potential risks and opportunities, banks can adapt their strategies and operations to maintain a healthy capital structure and drive sustainable profitability.

## REFERENCE


Abbadi, S. M., & Abu-Rub, N. (2012). The Effect of Capital Structure on the Performance of Palestinian Financial Institutions. *British Journal of Economics, Finance and Management Sciences, 3*(2), 92-101.

Abebe, T. (2014). Determinants of financial performance: An Empirical study on Ethiopian commercial Banks. *Unpublished MSC Thesis), Jimma University, Ethiopia*.

Amanuel, M. (2011). The determinants of capital structure evidence from manufacturing share companies of Addis Ababa city.

Amdemikael, A. (2012). *Factors Affecting Profitability: An Empirical Study on Ethiopian Banking Industry*. Addis Ababa Uiniversity, Accounting & Finance. Addis Ababa: Addis Ababa Uiniversity.

Amidu, M. (2007). Determinants of Capital Structure of Banks in Chaina: an Empirical approach. *Baltic Journal of Management, 2*(1), 67-79.

Ashenafi, B. (2005). Determinants of capital structure in medium enterprises in Ethiopia. *Master's thesis, Addis Ababa University*.

Ayalew, Z. A. (2021). Capital structure and profitability: Panel data evidence of private banks in Ethiopia. *Cogent Economics & Finance*, *9*(1), 1953736.

Aysen Doyran, M. (2013). Net interest margins and firm performance in developing countries: Evidence from Argentine commercial banks. *Management Research Review*, *36*(7), 720-742.

Berger, A. N. (1987). "Competitive Viability in Banking: Scale, Scope and Product Mix Economics". *Journal of Monetary Economics, 20*, 501-520.

Berger, A., & Patti, E. B. (2006). Capital structure and firm performance: a new approach to testing agency theory and an application to the banking industry,.*Journal of Banking and Finance, 32*, 1065-1102.

Brealey, R. A., Myers, S. C., & Allen, F. (2011). Financing Decisions. In *Principles of Corporate Finance* (p. 4). New York, NY,: McGraw-Hill/Irwin.

Chechet, I. L., &Olayiwola, A. B. (2014). Capital Structure and Profitability of Nigerian Quoted Firms: The Agency Cost Theory Perspective. *American International Journal of Social Science, 3*(1), 139-158.

Danisewicz, P., McGowan, D., Onali, E., & Schaeck, K. (2021). Debtholder monitoring incentives and bank earnings opacity. *Journal of Financial and Quantitative Analysis*, *56*(4), 1408-1445.

Ebaid, I. E. (2009). The impact of capital structure choice on firm performance: empirical evidence from. *The impact of capital structure choice on firm performance: empirical evidence from, 10*(5), 477 -487.

Eltabakh, M. L., Ngamkroeckjoti, C., &Siad, I. A. (2014). A comparison Study on The Profitability and its Determinants between Islamic and Conventional Banks Listed in Qatar Exchange (QE) Pre , During, and Post 2008 Global Financial Crisis. *International Conference on Business, Law and Corporate Social Responsibility*.

Farhad, A., &Aliasghar, A. (2013). The Relationship between Capital Structure and Profitability (Case Study in Tehran Stock Exchange). *Technical Journal of Engineering and Applied Sciences, 3*(16).

Flannery, M. J., & Giacomini, E. (2015). Maintaining adequate bank capital: An empirical analysis of the supervision of European banks. *Journal of Banking & Finance*, *59*, 236-249.

Frank, Z., &Gayol, M. V. (2003). Testing the peacking-order therory of capital structure. *Journal of Financial Economics, 67 (2003)*, 217-248.

Geda, A. (2006). Structure and performance of Ethiopia‟s financial sector in the pre & post reform period: with special focus on banking. *Research paper*( no. 2006/112).

Goyal, A. (2013). The impact of capital structure on Performance of Listed Public Sector Banks in India. *International Journal of Business and Management Invention, 2*(10), 35-43.

Gujarati, D. (2004). *'Basic Econometrics'* (4 ed.). Boston: McGrawHill.

Hadlock, C., & James, C. (2002). Do banks provide financial slack?,.*Journal of Finance, 57*(1), 383-420.

Hamza, A. M. (2022). *The impacts of the developmental state model on competition, efficiency and performance: The case of the Ethiopian banking industry* (Doctoral dissertation, Heriot-Watt University).

Ibhagui, O. W., & Olokoyo, F. O. (2018). Leverage and firm performance: New evidence on the role of firm size. *The North American Journal of Economics and Finance*, *45*, 57-82.

Jensen., M. (1986). The agency costs of free cash flow: corporate finance and takeovers. *American Economic Review, 76*(2), 323-329.

Jimma, E. (2014). *Determinants of financial performance: a study on selected micro finance institutions in Ethiopia* (Doctoral dissertation, Jimma University).

Khumaloand, S. M., Olalekan, Y. D., &Okurut, F. N. (2011). Determinants of Commercial Bank Interest Rate Margins in Swaziland. *International Journal of Economics and Business Studies, 1*(1), 3-21.

Li, Y. (2007). 'Determinants of Banks' Profitability and Its Implication on Risk Management Practices', Panel Evidence from the UK.

Makri Vasiliki, T. A. (2014). Determinants of Nonperforming Loans: The Case of Eurozone" Panoeconomicus. *2,* 193-206.

Mhlanga, D. (2021). Artificial intelligence in the industry 4.0, and its impact on poverty, innovation, infrastructure development, and the sustainable development goals: Lessons from emerging economies?. *Sustainability, 13*(11), 5788.

Mirzaei, A., Moore, T., & Liu, G. (2013). Does market structure matter on banks' profitability and stability? Emerging vs. advanced economies. *Journal of Banking & Finance, 37*(8), 2920-2937.

Modigliani and H. Miller. (1963). Corporate Income Taxes and the Cost of Capital: A Correction. *The American Economic Review, 53*(3), 433-443.

Modigliani and Miller. (1958). The cost of capital, Corporation Finance and the Theory of Investment. *The American economic Revlew, XLVIII*(3).

NBE. (2011). Licensing and Supervision of Banking Business Minimum Capital Requirement for Banks. *Directives No. SBB/50/2011*. Addis Ababa, Ethiopia: NBE.

Nguyen, D. S., Nghiem, Q. H., & Do, T. N. (2021). Non-Performing Loans of Commercial Banks, and Their Causes: Evidence from Vietnam. *Journal of Advanced Engineering and Computation, 5*(4), 239-253.

Nirajini, A., & Priya, K. (2013). Impact of Capital Structure on Financial Performance of the Listed Trading Companies in Sri Lanka. *International Journal of Scientific and Research Publications, 3*(5).

Octavia, M., & Brown, R. (2008). Determinants of Bank capital structure in developing countries. *Research Paper Series*.

Okoth, V. a. (2013). 'Determinants of Financial Performance of Commercial Banks in Kenya'. *International Journal of Economics and Financial, 3*(1).

Rajan, R. G., & Zingales, L. (1995). What do we know about capital structure? Some evidence from international data. *Journal of Finance, 50,* 1421-1460.

Saeedi, A., & Mahmoodi, I. (2011). Capital Structure and Firm Performance: Evidence from Iranian Companies. *International Research Journal of Finance and Economics, 70*, 21-28.

Short, S. (1979). "The Relation between Commercial Bank Profit Rates and Banking Concentration in Canada, Western Europe and Japan". *Journal of Banking and Finance, 3*, 209-219.

Shubita, D. M., &alsawalhah, D. J. (2012). The Relationship between Capital Structure and Profitability. *International Journal of Business and Social Science, 16*(Special Issue), 104-112.

Taani, K. (2013). Capital Structure effects on banking performance: a case study of Jordan. *International Journal of Economics, Finance and Management Sciences, 1*(5), 227-233. doi:10.11648/j.ijefm.20130105.13

Usman, M. U. (2013, December 23). Determinants of Capital Structure: Empirical Evidence from Large Taxpayer Share Companies in Ethiopia. *International Journal of Economics and Finance;*, *6*(1),

Yegon, C., Cheruiyot, J., Sang, D. J., & Cheruiyot, D. P. (2014). The Effects of Capital Structure on Firm's Profitability: Evidence from Kenya's Banking Sector. *Research Journal of Finance and Accounting, 5*(9), 152-159.

Zeitun, R., & Tian, G. (2007). Capital structure and corporate performance: evidence from Jordan. *Australasian Accounting Business and Finance Journal, 1*, 40-53.