Wolkite University

COLLEGE OF BUSINESS AND ECONOMICS

DEPARTMENT OF ACCOUNTING AND FINANCE

(GRADUATE PROGRAM)

THE EFFECT OF CAPITAL STRUCTURE ON FIRM PROFITABILITY

(The case of Ethiopian commercial banks)

A Thesis Submitted to the School of Graduate Studies of Wolkite University in Partial Fulfillment of the Requirement for the Degree of Master of Science (MSc.) in Accounting & Finance.

By

MELAKU MULU

Advisor: CHERNET.B (PhD.)

March, 2025

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Statement of declaration

I, Melaku Mulu, hereby declare that this thesis titled *"The Effect of Capital Structure on Firm Profitability: The Case of Ethiopian Commercial Banks in Wolkite, Ethiopia"* is my original work. It has not been previously submitted for the award of a Master of Science degree in Accounting and Finance at this or any other university. I further declare that all sources of information and materials used in the preparation of this thesis have been appropriately acknowledged.

Declared by:

Melaku Mulu

Signature_____

Date: _____

Wolkite University, Ethiopia

Endorsement

This thesis has been submitted to the School of Graduate Studies at Wolkite University for examination, with my approval as the university advisor.

CHERNET.B (PHD.) _____

(Advisor) Signature

Wolkite University, Ethiopia March, 2025

Statement of Certification

This is to certify that Melaku Mulu Debela has completed a thesis titled *"The Effect of Capital Structure on Firm Profitability: The Case of Ethiopian Commercial Banks in Wolkite, Ethiopia"* in partial fulfillment of the requirements for the Master of Science degree in Accounting and Finance. The thesis complies with the regulations of the university and meets the accepted standards of originality and quality.

Examined by:

Internal examiner: _____Signature _____ Date _____

External examiner: _____Signature _____ Date _____

Advised by:

Advisor: **Chernet.B (PHD.).** Signature _____ Date _____

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Chair of Department or Graduate Program Coordinator

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List of Acronyms and Abbreviations

ROE	Return on Equity
ROA	Return on Asset
NPM	Net profit Margin
NIM	Net interest margin
DTAR	Debt to Asset Ratio
DTER	Debt to Equity Ratio
DEPTA	deposit to total asset /liquid asset
SIZE	Firm Size
IC	Interest Coverage
OLS	Ordinary Least Square
EBIT	Earnings before Interest and Tax
PBV	Price book value
NPV	Net present value
CSE	Colombo stock exchange
GDP	Gross Domestic Product
TANG	Tangibility
INF	Inflation
CLRM	Classical Linear Regression Model
DW	Durbin-Watson

FA Fixed Asset

FEM Fixed Effect Model

OLS Ordinary Least Square

REM Random Effect Model

NBE National Bank of Ethiopia

JB Jarque Bera

CBE Commercial Bank of Ethiopia

DB Dashen Bank

AIB Awash International Bank

WB Wegagen Bank

NIB Nib international Bank

BOA Bank of Abyssinia

OIB Oromiya International Bank

BIB Birhan International Bank

BUIB Buna International Bank

DBE Development Bank of Ethiopia

Abstract

This study was aimed to investigate the effect of capital structure on firms' profitability with special emphasis on Ethiopian commercial banks Firms using panel data of nine consecutive years (2014 E.C-2022 E.C). The secondary data sources (audited financial statements) have been collected from the randomly selected nine Ethiopian commercial banks firms in Ethiopia. Linear regression model has been employed to analyze the relationship between firms' profitability and capital structure. The study employed EView8 software and panel data methodologies, particularly the Random Effect model for regression analysis. The researcher tested the CLRM assumptions error of zero mean, normality, heteroskedasticity, autocorrelation, and multicollinearity—on the data prior to the regression analysis. The study used two dependent variables ROA and ROE; three independent variables such as debt to asset ratio, debt to equity ratio and interest coverage ratio, two control variables size and tangibility and macroeconomic factor inflation. The regression result showed that variables DTAR, IC, TAN, FIRM SIZE and INF have positive and statistically significant effect on ROA at 1%, 1%, 5%, 5% and 1% significant level respectively. Whereas; DTER have negative and statistically significant effect on ROA at 1% significant level. In addition to all independent variables DTAR, IC, FIRM SIZE, TAN and INF have positive and statistically significant effect on ROE have at 1%, 1%, 5%, 1% and 5% significant level respectively.

The research concluded that capital structure has a significant effect on the profitability of Ethiopian commercial banks in Ethiopia. Finally the recommendations have been forwarded for commercial banks, management, regulatory body, policy makers and future study on the subject.Key Words: Capital structure, profitability, commercial banks in Ethiopia.

Chapter 1

1. Introduction

1.1. Background of the study

Capital structure decision is essential for commercial enterprise corporations. The capital structure decision is critical due to the want to maximize returns of the companies, and because of the impact, any such decision has on the company's capacity to deal with its aggressive surroundings. The capital structure of a company is an aggregate of various securities. In standard, firms can pick out amongst many opportunity capital structures. For example, firms can arrange lease/rent/ financing, use warrants, issue convertible bonds, signal forward contracts or alternate bond swaps. Companies also can problem dozens of distinct securities in countless combinations to maximize general market value (Abor, 2005).

The majority of empirical research on the connection between a company's capital structure and profitability has mostly concentrated on industrial enterprises. Nonetheless, there can be additional elements affecting the financial success of service companies that don't carry out manufacturing operations. Investments in machinery and equipment are usually minimal in the service sector. Working capital makes up a major portion of the overall capital invested by service organizations that lease their facilities, such as buildings (Gill, Biger, and Bhutani, 2009). We chose a sample of businesses from the industrial and service sectors to investigate if these different investment patterns are also connected to the capital structure of businesses.

Therefore, it is important to manage the capital structure in any situation to make sure the company can continue to operate and finance its projects. According to Ross et al. (2012), a microfinance institution's performance will therefore be determined by how it balances its debt and equity.

Finance theory states that a firm's cost of capital and, in turn, its financial performance are influenced by its capital structure. For many years, the argument over the ideal capital structure has dominated the literature on finance. Achieving exceptional performance requires the right balance of debt and equity, as the cost of capital acts as a baseline for capital

budgeting decisions. To best serve the firm's long-term objectives, companies should select the ideal ratio of debt to equity financing, according to the maximization of shareholders' wealth concept. According to capital structure theory, businesses should set a target debt ratio that accounts for the trade-offs between the advantages and disadvantages of debt and equity. Even though capital structure choices are crucial, empirical research hasn't revealed much about the ideal amount of debt financing. Because the current literature has not yet succeeded in bridging the gap between theory and practice, logical parameters backed by empirical evidence are still awaited (Abor, 2005).

Myer (2016) asserts that capital structure research aims to elucidate the assortment of securities and funding sources that businesses employ when making financial investments. Capital structure is also defined by Bradley and Myer (2007) as a comparison of the firms' debt, equity, or hybrid securities. Schlosser (1989) defined capital as the ratio of a company's debt to its overall capital. Firms can choose between internal and external financial instruments by using Haugen and Senbet's capital structures. According to Bos and Fetherston (2003), a company's capital structure—which is the ratio of its total debt to its total assets at book value—affects its riskiness and profitability. "Capital structure can be referred to as the combination of debt and equity in financing a corporate body," as many previous academics have defined it. Equity is produced when companies raise funds for operations and investments by selling off a portion of their ownership rights. Debt is a legal agreement whereby companies borrow funds and repay them over a specified time period, plus interest. Most businesses will fail to make the most of their assets when they have an unplanned capital structure. The choice of debt to equity is still crucial since a company's capital structure has a significant impact on its profitability.

According to Maheshwari (2011), a company's profitability is a reflection of its capacity to turn a profit across the board. This is a gauge of how effectively management can produce revenue using the market's available money. Growth in profits is regarded as every company's top priority. Firm owners need to learn how to reach a satisfactory level of production in a competitive marketplace. Determining which components of a financial strategy are functioning well and which ones want improvement is part of overall productivity. Making the best choices to optimize the organization's profits is the responsibility of management.

Organizations that are sincere make sure they have return targets and sometimes pay executives for meeting them, but their goals are still greater than their profits alone (Petersen and Kumar, 2010).

Capital structure describes how a company is financed, usually by combining loan and equity. Many scholars who have looked at the connection between capital structure and firm performance have found it to be of great interest. The choice of how to fund a business is made by the capital suppliers as well as the managers of the business. An incorrect debt-to-equity ratio can have a detrimental effect on a company's profitability and possibly its long-term survival. Because different organizations employ leverage differently, managers must carefully analyze capital structure decisions, which can be complex, in order to maximize company value. In their capital structure, managers usually aim to achieve the ideal balance between debt and equity (Nur et al., 2017).

The concept is commonly defined as the sum of debt and equity that makes up a company's overall capital (Saeedi & Mahmoodi, 2011). Corporate managers strategically choose the debt-to-equity ratio. Decisions about capital structure are important because they have a direct impact on a company's profitability and financial success. As a result, while choosing the capital structure, great thought and care must be taken. The entire position of a company's assets and liabilities is shown in its financial statement, and capital is an essential part of this statement (Saad, 2011).

In this regard, careful attention must be given to the impact of capital structure. An unplanned capital structure may prevent companies from efficiently utilizing their funds. As a result, it is increasingly recognized that companies must strategically plan their capital structure to maximize the use of their resources and adapt more effectively to changing conditions (Pandey, 2009).

In Ethiopia, studies have been conducted on the determinants of capital structure and its effects on both banking and non-financial sectors. Existing empirical research, however, has mostly concentrated on how capital structure affects how businesses employ debt and equity to finance their operations in order to optimize shareholder benefits. Examining how capital

structure affects financial institutions' profitability—a subject that has received little attention in prior research would be a reasonable next step in the Ethiopian financial system.

When analyzing the financial success of companies, profitability ratios are crucial as they measure efficiency and ultimately indicate a firm's success or failure (Investopedia). An ideal balance between debt and equity is necessary for financial firms to optimize profitability. Thus, the purpose of this research is to investigate how capital structure affects Ethiopian commercial banks' profitability, with an emphasis on the fundamentals of both capital structure and profitability. In addition to helping identify the best capital structure to attain maximum profitability and, consequently, increase shareholder value, this research will give financial managers useful insights into possible problems relating to profitability and capital structure. Therefore, this study looks into how capital structure affects Ethiopian commercial banks' profitability. Based on financial data gathered from nine Ethiopian commercial banks between 2015 and 2023, it employs panel data econometric analysis.

1.2. Problem statement

Finding the ideal debt-to-equity ratio that optimizes shareholder wealth is the responsibility of financial managers. This duty has raised interest in determining whether there is a capital structure that maximizes a firm's value. Large, publicly traded companies have been the subject of the majority of research on how capital structure affects business performance in industrialized nations (Mohammed et al., 2015).

The problem of capital structure and its effect on company fee has been the situation of high-quality landmark during the last numerous years in the finance literature. As an example, Modigliani and Miller (2011) irrelevance idea argued that capital shape is unrelated to firm's value. But, within the presence of company earnings tax and the cost of capital Modigliani and Miller (2013) argued that the marketplace value of the firm is positively associated with the quantity of long term debt used in its capital structure. Furthermore, in theoretical models of capital structure, there are special views about the goal capital structure. For example, the static trade off concept argues that there may be an optimal capital shape that maximizes firm price whilst the pecking order speculation assumes that there may be no well-described target capital

structure rather financing is the problem of the threat associated with every financing alternatives (Fama and French, 2002).

There has been considerable debate and conflicting views on the existence of an optimal capital structure. When a company's value is maximized and its cost of capital is minimized, it has an optimal capital structure. However, there is no empirical support for the idea of funding entirely with debt. Because of the flexibility in selecting a financial structure, businesses can participate in capital restructuring, modifying their debt-to-equity ratio in response to current circumstances, particularly the operating environment, in order to optimize value and reduce expenses. According to Ajao (2008), businesses should employ debt until the tax advantages of debt precisely offset the expenses brought on by heightened financial distress.

Financial decision-makers must carefully consider the capital structure option since it affects Earnings Before Interest and Taxes (EBIT), which in turn affects the market and share value of the company. The ideal capital structure that lowers the cost of capital and boosts business profitability has not yet been identified by corporate finance scholars or practitioners. A value-maximizing company weighs the trade-off between the tax shelter that debt offers and the expense of financial difficulty, according to the static trade-off hypothesis. In other words, businesses balance the net tax benefits of debt financing against the drawbacks in order to determine the best capital structure (Brealey & Myers, 2013).

The critical research gap identified with this look at is failure with the aid of management in business and service companies to hyperlink profitability to capital structure. That is because of the fact that numerous corporations have different blend of debt and equity in their capital structures. Empirical studies have but set up that there may be no perfect capital structure that is relevant to all companies/firms/ (Michalak, 2014).

According to Jensen (2009), debt serves as a disciplinary measure to make sure managers put shareholders' wealth generation first. Increased debt can be used as a technique to limit executive discretion in highly profitable companies when managers have free cash flow, which lowers the possibility of resources being exploited for personal gain (Jensen & Meckling, 2014). Additionally, according to the pecking order theory, businesses make financing decisions in a hierarchical manner: first, they employ internal financing; second, if internal funds are

insufficient, they issue debt; and third, equity financing is only taken into consideration as a last resort (Rasian & Kim, 2011).

Many studies have been conducted using various methods and data from both developed and developing countries to examine the effects of capital structure on firm profitability. These studies investigate the relationship between leverage ratios, profitability, firm size, and other factors such as non-debt tax shields, firm growth, and the collateral value of assets. However, the consequences of their studies provide contradictory and combined that is composed negative, effective and blended correlation between economic overall performance (profitability) and the leverage ratio of firms in developed and developing countries.

Chiang and Fen's study from 2013 examines how capital structure affects the profitability of Hong Kong-registered businesses. The results showed a strong correlation between the capital structure and productivity of non-financial companies listed on the Islamabad Stock Exchange. Abor (2005) investigates the relationship between the productivity of companies listed on the Ghana Stock Exchange and their capital structure. The proportions of short-term debt to total assets were shown to be positively correlated. Mendell and Mishra (2011) examined the relationship between debt and levies hypothesized in business philosophy in order to examine financing patterns across enterprises in the woods produces industry. A study discovered an unfavorable correlation between debt and productivity.

Ondiek (2010) investigated the connection between the financial presentation and capital structure of companies listed on the Nairobi Securities Exchange. It was nonetheless evident that the firm's size, profitability, and asset tangibility all had an impact on capital structure. Kuria (2013) investigated the impact of capital structure on Kenyan commercial banks' financial performance. The results revealed no significant correlation between Kenyan commercial banks' capital structure and financial presentation. Tale (2014) investigated the relationship between the capital structure and financial presentation of Kenyan non-financial enterprises that are registered with the NSE. Research revealed a clear correlation between the debt-to-equity ratio and financial presentation. Despite these research, Ondiek (2010), Kuria (2013), and Tale (2014) are inconclusive about the relationship between registered companies' capital structure and productivity. Ondiek (2010) employed a sample of twenty publicly traded companies, Tale (2014) concentrated on non-financial companies, while Kuria (2013) examined Kenyan

commercial banks. Since these studies were not comprehensive, the current study determined that it was worthwhile to conduct a thorough investigation in order to improve knowledge of the relationship between registered enterprises' capital structure and productivity.

In Ethiopia perhaps as to the researcher's knowledge, there are few researches conducted where most of them are emphasized in determinants of capital structure. Amanuel (2011) examined capital structure factors using data from Addis Ababa's manufacturing share businesses. Bayeh (2011) conducts empirical research on the factors that influence capital structure. the situation of Ethiopian insurance firms, Daniel (2011) looked into the factors that affect capital structure in small-scale manufacturing cooperatives in Ethiopia. Weldemikal (2012) investigated the factors influencing capital structure in Ethiopian commercial banks. Mohammed (2014) examines capital structure determinants and how they affect Ethiopian insurance companies' performance data. Frezewed (2016) examines the relationship between company capital structure and profitability, evidenced from manufacturing firms in Ethiopia, Tamirat (2015) examine the effect of debt financing on profitability of commercial banks in Ethiopia.

Therefore, based on the above studies, there hasn't been any empirical research conducted in Ethiopia on how capital structure affects firm profitability. This encourages the researcher to fill the knowledge gap by contributing to the study of how capital structure affects firm profitability of Ethiopian commercial banks.

1.3. Objectives of the Study

1.3.1. General Objective

The main objectives of this study it to empirically examine the effect of capital structure on Firm profitability of Ethiopian commercial banks.

1.3.2. Specific Objectives

- To examine the effect of debt to asset ratio on profitability of Ethiopian commercial banks
- To investigate the effect of debt to equity ratio on profitability of Ethiopian commercial banks
- To examine the effect of interest coverage ratio on profitability Ethiopian commercial banks

1.4. Research Hypothesis

This research tested the three hypotheses in order to investigate the effect of capital structure on firm profitability of selected Ethiopian commercial banks in Ethiopia. Thus, the hypotheses below were tested in this study.

H1: Debt to asset ratio has positive and statistically significant effect on profitability of Ethiopian commercial banks

H2: Debt to equity ratio has positive and statistically significant effect on profitability of Ethiopian commercial banks

H3: Interest coverage ratio has positive and statistically significant effect on profitability of Ethiopian commercial banks.

1. 5. Significance /Value of the Research/

This study examines the effect of capital structure on the profitability of Ethiopian commercial banks, offering valuable insights for various stakeholders. Among the key beneficiaries are:

Management: The findings will help management, particularly the board of directors, understand how to make decisions regarding the optimal capital structure to achieve the bank's profit maximization goal. Additionally, it will assist in determining the optimal capital structure level that maximizes the firm's value and profitability while minimizing the cost of capital.

Government: The study can serve as a valuable resource for policymakers, such as the National Bank of Ethiopia, to evaluate the appropriate level of capital requirements for private commercial banks.

Investors: Investors seek to invest in firms that offer maximum profitability with minimized risk. This study can guide investors by providing insights that help them make informed decisions about where to invest, thereby protecting their investments.

Customers: Customers interested in establishing business relationships with private commercial banks will benefit from understanding the current performance of these banks. This study can serve as a reference for customers when choosing which banks to engage with in Ethiopia.

Researchers: The study can also be used as a reference for future research on corporate finance, capital structure, and profitability, providing a foundation for further academic inquiry.

1.6. Delimitation of the study

The scope of this study is focused on examining the effect of capital structure on firm profitability of nine commercial banks in Ethiopia over a period of nine years (2015 to 2023). The goal of the study is to extrapolate results from the sample to the entire population. The researcher chose the greatest number of banks and years for which audited financial statements were accessible in order to increase the number of observations and guarantee adequate data. The nine Ethiopian commercial banks that have been in operation and submitting audited financial statements between 2015 and 2023 are the source of the study's 81 observations in total. The study uses the debt-to-asset ratio, debt-to-equity ratio, and interest coverage ratio as independent variables to precisely examine how capital structure affects firm profitability in order to meet its goals. The profitability of the company, the dependent variable, is compared to these variables.

1.7. Limitation of the study

One of the limitations of this study, which may affect the significance of the expected outcomes, was the reliance on publicly available audited financial statements of the respective banks. To mitigate this limitation, the researcher used these published financial statements to gather data. The primary limitation that hindered the study was resource constraints, which affected the scope and depth of the research.

1.8. Organization of the Study

The main focuses of this study is to investigate how capital structure affects Ethiopian commercial banks' profitability. There are five chapters in the research: The research backdrop, problem statement, study objectives, hypotheses, significance and usefulness of the research, study scope and delimitations, study limitations, and definitions of important words are all included in the first chapter's introduction. Chapter 2: An overview of the conceptual, empirical, and theoretical research on profitability and capital structure. Research methodology is covered in Chapter 3, which describes the study's strategy and techniques. Chapter Four result and discusses the study's key findings, and Chapter Five emphasize a conclusion and recommendations based on the findings.

1.9. Definition of key Terms

1.9.1. Capital Structure

A company's capital structure is the combination of its debt and equity, reserves, and surpluses (Siddik et al., 2016). Capital structure analysis has always been a significant topic from the perspective of strategic management since it aims to satisfy the demands of the many stakeholders in a company (Sultan and Adam, 2015).

1.9.2. Firm Profitability

According to Maheshwari (2001), a company's profitability is a reflection of its capacity to turn a profit from each and every one of its commercial operations. It acts as a gauge of how well management can produce revenue with the capital at hand. Increasing profits is frequently regarded as a company's main goal. Business owners need to learn how to reach a satisfactory level of productivity in a competitive market. The process of determining which elements of a financial plan are successful and which require development is known as cumulative productivity. A company's management is in charge of making choices that optimize organizational results. In reality, businesses establish return goals and frequently provide incentives to executives who reach them. But it's crucial to remember that a company's goals extend beyond making money (Petersen and Kumar, 2010).

1.9.3. Debt

Both short-term and long-term borrowing intended to fund a business's operations are referred to as debt. Businesses choose debt financing since interest paid on debt is tax-free, increasing a company's worth (Iavorskyi, 2013).

1.9.4. Equity

After liabilities are subtracted, equity capital is the shareholders' interest in the company's assets. Common stock (share capital), preferred stock, capital surplus, retained earnings, and reserves are all examples of equity in financial statements (Stephen, 2012).

CHAPTER TWO

2. RELATED LITRATURE REVIEW

2.1. General Introduction

The literature review section of this study provides an overview of the impact of capital structure on the profitability of commercial banks in Ethiopia. A review of theoretical and empirical research on capital structure and how it affects profitability is part of it. This section also outlines the conceptual framework for the study, underlines the knowledge gaps that currently exist, summarizes empirical research in the topic, and talks about the study variables.

2.2. Capital requirements of Ethiopian commercial Banks in Ethiopia /Banking System/

The Ethiopian banking sector currently consists of the National Bank of Ethiopia (NBE), one state-owned development bank, a government-owned commercial bank, and over 30 private banks, including newly established ones like Amhara Bank, Tsehay Bank, Tsedey Bank, Ahadu Bank, and Goh Betoch Bank SC. In June 2021/22, the NBE raised the minimum paid-up capital requirement for establishing a banking business to 5 billion Ethiopian Birr (approximately $90 million).

Foreign banks are not allowed to operate directly in Ethiopia, though government-owned entities (GOE) suggest that the sector could open up in the medium term as part of broader economic reforms. However, Ethiopia has allowed a few foreign banks to open liaison offices in Addis Ababa, which helps facilitate credit to local companies. Banks from countries like China, Germany, Kenya, Turkey, and South Africa have opened liaison offices in Ethiopia.

The state-owned Commercial Bank of Ethiopia (CBE) is the market leader, holding over 60% of total bank deposits, loans, and foreign exchange, along with a significant share of the country's banking workforce and branches. The other government-owned bank, the Development Bank of Ethiopia (DBE), focuses on providing credit to priority sectors such as industry and agriculture. DBE offers both short- and long-term loans for development projects but has struggled with high levels of non-performing loans (NPLs), inefficient capital allocation, and corruption. As a result,

it is a key target for ongoing government reform efforts and is undergoing significant restructuring.

The NBE's primary objectives include fostering monetary stability and ensuring a sound financial system, while maintaining credit and exchange conditions that support the balanced growth of the economy. The central bank sets a minimum deposit rate of 7%, while loan interest rates are allowed to fluctuate. In recent years, real deposit interest rates have been negative due to inflation, which reached 34% by the end of 2021/2022. The NBE also has the authority to engage with banks and other financial institutions in various financial operations, including the discount, rediscount, purchase, or sale of bills of exchange and other credit instruments with maturities not exceeding 180 days.

Furthermore, the NBE may buy, sell, and hold foreign currency and related financial instruments such as telegraphic transfers, which are commonly used in international payments. With NBE authorization, commercial banks in Ethiopia are permitted to offer mobile and agent banking services. In April 2020, the NBE issued new regulations allowing domestic, non-financial businesses to provide mobile money services and engage in electronic payments. This initiative aims to address the significant financial access constraints faced by local businesses.

2.3. Theoretical Framework

The theories of capital structure and how they affect business profitability are reviewed in this section of the literature study.

2.3.1. Overview of Capital structure

The several financing alternatives a company utilizes to fund its assets are referred to as its capital structure (Modugu, 2013). A company can generally select from a variety of debt, equity, and other financial arrangements. The 1958 introduction of Modigliani and Miller's (M&M) model, which is regarded as a turning point in the evolution of contemporary corporate finance theory, laid the theoretical groundwork for capital structure research. In a capital market devoid of taxes, transaction fees, and other impediments, the M&M theory provides information about a company's capital structure choices.

Having access to finance is crucial for a firm to thrive. But the question still stands: how do commercial entities obtain this funding? Stated differently, what are the funding sources? The goal of capital structure decisions is to provide an answer to this query. Because it influences a firm's ability to navigate its competitive environment, an optimal capital structure is essential for firms' survival and growth as well as for optimizing returns (Mathewos, 2016).

Researchers in corporate finance have put a lot of effort into turning the theory of capital structure from logical ideas to actual data during the last few decades. The problem of creating a conclusive theory of capital structure and creating empirical tests that are strong enough to distinguish between conflicting theories, however, has not yet been overcome (Charles Yegon et al., 2014).

Deesomsak et al. (2014) investigated how capital structure affected business performance and discovered a negative correlation between the two, as indicated by the gross profit margin of Malaysian companies. The study also found a negative but statistically insignificant correlation between leverage and company performance in Singapore, Taiwan, and Australia. Furthermore, the study discovered that, with the exception of Singapore, where businesses enjoy government assistance and are less vulnerable to the consequences of financial crisis, the relationship between firm size and leverage was considerable and favorable in every nation.

Nimalathasan and Brabete (2010) systematically examined the relationship between capital structure and financial performance in firms listed on the Colombo Stock Exchange in Sri Lanka. Their findings provide guidance for entrepreneurs and policymakers in making informed decisions regarding the debt-equity mix and capital structure planning.

Abor (2005) investigated the connection between profitability and capital structure in companies that were listed on the Ghana Stock Exchange. Due to low interest rates, the study discovered a positive correlation between return on equity and short-term debt to total assets. Additionally, the survey found that short-term debt was a crucial component of financing, accounting for 85% of all debt in Ghanaian businesses. While total debt and profitability were found to be positively correlated, long-term debt and equity returns were found to be negatively correlated. Abor added that debt is regarded as a significant source of funding for extremely successful businesses.

2.3.2. Theories of Capital structure and Profitability/Value of firm

Trade-off Theory: The trade-off theory refers to the balance between the benefits and costs of debt and equity financing, accounting for market imperfections such as taxes, bankruptcy costs, and agency costs. Modigliani and Miller (2011, 2013) initially assumed the absence of bankruptcy and agency costs in their model. However, in the real world, these costs do exist and reduce the tax advantages of debt. The theory suggests that there is an optimal level of debt at which a firm's value is maximized, referred to as the "optimal capital structure." This level represents the point at which the tax benefits of debt are balanced with the costs associated with financial distress (Myers, 2008).

When firms are profitable, they tend to prefer debt over equity, as interest payments on debt are tax-deductible, reducing their net income and, consequently, their tax liability (IFS, 2011). However, excessive reliance on debt can lead to financial distress costs, which is a significant disadvantage of using debt financing. Firms generally target capital structures that include more debt when past returns are positive and serve as a good indicator of future returns, as firms aim to implement highly efficient output strategies (Jensen and Meckling, 2014).

Firms with lower profits may prefer using internal funds, as external financing could be more expensive. Additionally, non-debt tax shields, such as depreciation, could outweigh the tax benefits of using debt (De Angelo, 2005). The dynamic trade-off theory further builds on these concepts by incorporating time, expectations, and adjustment costs into financing decisions. It suggests that firms' financing decisions depend on their anticipated financing needs in the future. For instance, some firms may expect to pay out funds in the next period, while others may need to raise funds. Thus, the optimal financing decision today is often based on what is expected to be optimal in the future.

The trade-off approach does not entirely account for changes within the same industry, but it does assist explain differences in debt-to-equity ratios among industries. Additionally, it makes the assumption that larger companies are more diversified, less risky, more reputable, have more steady cash flows, and are less likely to encounter liquidation concerns. Large companies are therefore more resilient to financial difficulty and insolvency since they may obtain financing at reduced rates and frequently have easier access to capital markets (Mohammed G., 2014).

The trade-off theory has also been applied to the study of bank funding. Deposits, commonly viewed as a form of debt, play a role in this theory as well (Calabrese, 2016). Therefore, deposits are linked to the trade-off theory in the context of this study. According to the theory, managers seek to balance the costs and benefits of debt to achieve an optimal leverage level. The tax-deductible nature of interest on debt reduces the effective cost of using debt compared to equity, providing firms with a clear incentive to incorporate more debt into their capital structure (Myers, 2016). Additionally, debt can help reduce an organization's free cash flow, further aligning managers' interests with shareholders (Myers, 2016).

Agency Costs Theory: Conflicts of interest between managers and shareholders result from the division of ownership and control. The problem of free cash flows is a major source of contention. According to Jensen (2014, as mentioned in Saleyi & Biglar, 2009), debt serves as a tool for discipline that pushes managers to put equity holders' wealth development first. Increased debt can be used to restrict managers' discretion and stop them from exploiting company resources for personal gain in profitable and cash-flowing businesses.

Another conflict arises when managers do not receive all the benefits of their actions, which is often the case when their ownership stake in the company is low. However, when managers hold a higher percentage of stock, this inefficiency tends to decrease (Saleyi et al., 2009)

Potential bankruptcy expenses and agency fees associated with bondholders' investment monitoring are also included in the costs of debt. When deciding on a company's capital structure, the advantages and disadvantages of different funding sources are "traded off" until the marginal cost of debt and equity are equal. This creates the ideal capital structure and maximizes the firm's value. Jensen (as cited in Saleyi & Biglar, 2009) argues that the conflict between shareholders and creditors can lead to higher interest rates, increased supervision costs, and reduced investment, ultimately demonstrating that high leverage can impair firm performance.

Market Timing Theory: This theory suggests that issuance decisions have a long-term impact on a firm's capital structure because managers issue securities based on the relative costs of debt and equity at different times. In particular, businesses would rather issue debt when equity is more expensive and equity when it is less expensive (Leon, 2013). Stockholders are entitled to the remaining value following bondholders' pledged payments because those payments are set.

As a result, stock prices are more sensitive to any confidential information regarding the company's future performance than bond prices. When management releases positive information that hasn't yet been reflected in market pricing, stock prices will rise more than bond prices, giving the impression that the stock is cheap in comparison to bonds (Molyneux & Thornton, 2012). This theory implies that firms, especially profitable ones, will prefer issuing debt over equity if they believe their shares are not undervalued. On the other hand, firms that perceive their stocks to be overvalued are more likely to issue equity. Regardless of whether firms believe their stock is undervalued or overvalued, they should expect a drop in stock prices when new equity is issued.

According to the Pecking Order Theory, businesses have a distinct hierarchy for funding choices. Internal funding, like retained earnings, is the first option. The company will use debt funding as a last alternative if internal funds are insufficient, with stock offering coming last. Since internal funds don't require float and don't reveal confidential financial data that would put the company at risk of more stringent market laws and a competitive edge, they are favored (Rasian & Kim, 2011). Myers (2016) asserts that businesses should use external funding as a top priority, starting with debt and moving on to convertible securities, preferred stock, and common stock. The theory also highlights asymmetric information, which states that managers usually have a better understanding of the company's financial situation and prospects for expansion than do external investors. The use of internal funds helps prevent the need for public disclosures that might reveal sensitive information. Additionally, managers are assumed to act in the best interests of existing shareholders, which may lead them to reject positive Net Present Value (NPV) projects if it requires issuing new equity, thus diluting shareholder value (Myers & Majluf, 2008).

Free Cash Flow Theory: This theory suggests that firms often maintain high levels of debt because they believe it increases firm value, despite the risks of financial distress. Free cash flows occur when a company’s operating cash flow significantly exceeds its profitable investment opportunities, a common situation for mature firms that may over-invest. Myers (2016) notes that mature, cash-generating companies are prime candidates for leveraged buyouts, although Brealey and Myers (2013) caution against attributing leveraged buyouts solely to the free cash flow theory.

Modigliani and Miller Theory: The development of capital structure theory was made possible by Modigliani and Miller's groundbreaking work in corporate finance. Financial leverage has no effect on a firm's value, according to their 2011 theory, which is commonly referred to as the "capital structure irrelevance" proposition. However, their theory is predicated on a number of restricted assumptions that are not true in the real world, including homogenous expectations, perfect capital markets, no taxes, and no transaction costs. The idea of a "optimal" capital structure one that maximizes business value and reduces the overall cost of capital—was developed as a result of the introduction of bankruptcy costs and the tax benefits of interest payments. Modigliani and Miller revisited their earlier position by incorporating tax benefits as key determinants of capital structure. Specifically, the tax deductibility of interest payments allows firms to reduce their tax burden, thereby generating a "tax shield." This led them to propose that firms should use as much debt as possible to maximize profitability and, consequently, firm value (Modigliani & Miller, 2011).

Signaling Theory: Spence (2015) extended the idea of signaling, which was first examined in relation to product and employment markets, to signaling equilibrium theory. According to the hypothesis, a good company can set itself apart from a bad company by communicating to the capital markets reliable information about its caliber. A signal must be more expensive for low-quality businesses than for high-quality ones in order to be considered credible. Bad firms might not find it worthwhile to imitate excellent enterprises if the cost of signaling is excessively high, preserving the signal's credibility. This concept was expanded upon by Ross et al. (2012), who demonstrated how debt may be used as an expensive signal to distinguish high-quality businesses from low-quality ones. In this context, asymmetric information exists between management (insiders) and investors (outsiders), where managers know the true distribution of firm returns, but investors do not. By increasing their debt levels, high-quality firms signal an optimistic future, while low-quality firms will tend to avoid high debt levels to prevent the risk of exposure. This approach also distinguishes two types of signaling: costly signaling equilibrium (Spence, 2015) and costless signaling equilibrium (Brennan & Kraus, 2013). A signal is considered costly if its production consumes resources or leads to welfare loss due to inefficiencies in the market. In financial markets, signaling theory suggests that debt can serve as an effective signal to distinguish high-quality firms from potential competitors or new entrants.

Windows of Opportunity: The Windows of Opportunity theory assumes that while markets are generally efficient, there are instances where stock prices and interest rates do not reflect the true fundamental values of securities. Essentially, the theory suggests that managers "time the market" based on their perception that the market has overvalued or undervalued certain securities. This approach contrasts with signaling theory because it does not rely on asymmetric information. Instead, it reflects a difference in opinion between managers and the market consensus, with managers believing that they can capitalize on market inefficiencies (Baker et al., 2002). Unlike signaling theory, which is based on insider information, the Windows of Opportunity theory assumes that market conditions themselves present opportunities for firms to exploit timing discrepancies.

2.3.3. Profitability

Profitability refers to the level of profit a company generates from its operations. Profits, after accounting for interest and taxes, are the benefits that shareholders expect to receive. A higher profit level indicates a company's effective utilization of its assets to maximize operational outcomes (Yulandani, Hartanti, & Dwimulyani, 2018). Increased profitability leads to higher earnings per share (EPS), which in turn attracts investors to purchase the shares of company's. As a result, a company's performance, particularly in terms of management efficiency, is often assessed through its profitability (Vaeza & Hapsari, 2015). High profitability is commonly perceived as a sign of strong company prospects, prompting positive market responses and an increase in the company's overall value (Sujoko & Soebiantoro, 2007). A number of financial statistics, including Return on Equity (ROE), Return on Assets (ROA), and Net Profit Margin, can be used to gauge profitability.

Dewa, Fachrurrozie, and Utaminingsih (2014) explored the effect of profitability on company value, incorporating broad Corporate Social Responsibility (CSR) disclosure as a moderating factor. Their research revealed that a company's worth is significantly impacted by its profitability. The impact of firm size, leverage, price-to-earnings ratio, and profitability on firm value was also studied by Prasetyorini (2013), who came to the conclusion that profitability is a key factor in establishing a company's worth. Additionally, Hermuningsih (2013) examined the effects of capital structure, growth potential, and profitability on the value of Indonesian public companies and discovered that all three factors significantly and favorably influence firm value.

2.4. Empirical Literature Review on Capital structure and profitability

2.4.1. Cross Country Studies

In this section empirical studies that have been made regarding on the effect of capital structure on firm profitability of commercial banks.

2.4.1.1. The Effect of Capital Structure on Profitability

According to Denise and Robert's (2009) research, profitability was positively correlated with an investment strategy based on equity, or firm ownership capital. In particular, businesses' profits (returns) to shareholders will rise if their loan returns exceed the interest paid. On the other hand, capital structure has no discernible impact on financial performance, according to Kusumasari et al. (2009). On the other hand, Safieddine and Titman (2007) came to the conclusion that as leverage recapitalization rises, a company's financial performance improves.

2.4.1.2. The Effect of Capital Structure on Firm Values

According to Brigham and Houston (2011), Modigliani and Miller (2011) demonstrated that capital structure has no bearing on the firm's value. Such proof is predicated on the following assumptions: that there are no taxes, brokerage fees, or bankruptcy; that investors can borrow at the same interest rates as the company; that all investors have access to the same information; and that the cost of debt has no effect on EBIT. These findings show the circumstances in which capital structure is unimportant. Additionally, Modigliani and Miller advised that capital structure should be pertinent in order to influence the firm's worth.

According to the trade-off theory of leverage, the best capital structure is obtained by weighing the advantages of debt, such as tax shelters, against the disadvantages of increased bankruptcy risks (Brigham & Houston, 2011). Modigliani and Miller also underlined that a firm's worth rises when it uses more debt when corporate income taxes are in place. It's crucial to remember, too, that agency fees and financial difficulties can lower the value of highly leveraged companies.

Soliha and Taswan (2012), debt policy increases business value, albeit somewhat. Ownership structure had a considerable impact on leverage (as determined by the debt-to-equity ratio) and company value (as determined by Tobin's Q) in Indonesia, Korea, and Malaysia, while this effect was negligible in Thailand, according to Driffield et al. (2007). In a similar vein, Syarif (2007) discovered that raising debt can increase a company's worth. On the other hand, leverage has a

detrimental effect on the possibility of increasing business value in the future, according to research by Arijit (2008) and Kusumajaya (2011). Sudjoko and Soebiantoro (2007) showed that business size, as shown by total assets, and debt policy, as indicated by the debt-to-equity ratio (DER), have a positive and significant impact on the price-to-book value (PBV). These findings were supported by Ekayana (2007). However, Chen (2002) found that capital structure has a positive but insignificant effect on firm value, and also showed that firm value would increase if a company chose not to use debt in its capital structure.

2.4.1.3. The Effect of Firm Growth on Profitability

Greiner (2015), there may be a positive or negative correlation between a company's growth and profitability. If not, that expansion may occasionally lead to the breakdown of unofficial connections made within the organization. More formality in the form of work relationships is necessary for larger growth, but this is hard to accomplish effectively in the short term. This situation results in a decrease in the company's profitability. However, as a result of the increased motivation of employees who anticipate higher salaries in the future due to the company's larger size, greater expansion can also result in greater profitability. According to the study's findings, the ability of management to inspire staff members is crucial in determining how a company's growth affects profitability. The expansion of the company may boost its profitability if the benefits of improved employee motivation outweigh the drawbacks of altered employment relationships. Otherwise, company expansion could make the company less profitable.

Growth and profitability were not shown to be significantly correlated by either Roper (2009), who researched Irish companies, or Gschwandtner (2005), who analyzed American companies. On the other hand, Serrasqueiro (2009) added to the body of research in this field by examining Portuguese businesses and discovering proof of a strong and positive correlation between profitability and growth. Based on these findings, it can be inferred that employee motivation stemming from the potential for higher future earnings may be an important factor in helping companies overcome temporary inefficiencies associated with transitioning to more formalized work relationships.

From a methodological perspective, the relationship between growth and profitability is analyzed using dynamic panel data techniques, including Generalized Method of Moments (GMM, 2007),

the GMM system (2011), and Least Squares Dummy Variable Corrected (LSDVC, 2005) estimators. Initially, these methods are applied to evaluate the relationship between growth and profitability. Subsequently, additional variables are introduced to explain profitability, enabling a more comprehensive analysis of the growth-profitability relationship. The explanatory variables considered include: 1) company size, 2) debt levels, and 3) liquidity (Adams and Buckle, 2003; Goddard et al., 2005). By employing dynamic panel data techniques, the study can assess the strength of the profitability relationship over time and examine how past profitability influences current performance.

2.4.1.4. The Effect of Firm Growth on Firm Value

According to Kallapur and Trombley (2009), the expansion of a company's equity and assets is a good indicator of its progress. The company's investment choices and long-term financial utilization are reflected in its assets. Anything that increases cash inflows or decreases outflows might be considered an asset, which is defined as a resource with the potential to produce future economic advantages. The corporation must have acquired the right to utilize an item through a previous transaction or exchange, and the anticipated future benefits must be measurable with a reasonable level of accuracy, in order for it to be recognized as an asset.

Helfert (2007) explains that firm growth results from changes in the company’s cash flow, typically driven by fluctuations in business volume. Whether the growth is internal or external, it is seen as a positive indicator of the company's development. For investors, firm growth signals favorable prospects, leading them to expect a higher rate of return on their investments in a growing company.

Stulz (2010) found that the relationship between debt and firm value depends on the company’s growth opportunities. When a company faces low growth prospects, a higher debt ratio tends to correlate positively with its value. However, in companies with high growth opportunities, a higher debt ratio is often associated with a lower firm value. This highlights that the impact of debt on firm value is closely linked to the company’s growth potential.

Sriwardany (2006) showed that changes in stock prices are positively impacted by business expansion. This indicates that when a company's growth is reported, investors usually react favorably, increasing the value of the company's stock. Safrida (2008), on the other hand,

discovered a different outcome, demonstrating that firm development had a negligible detrimental effect on firm value.

2.4.1.5. The Effect of Dividend Policy on Profitability

Lee et al. (2012), who investigated the relationship between changes in current dividends and future earnings for companies listed on the Malaysian Stock Exchange between 1998 and 2007, informs research on the effect of dividend policy on profitability. According to their research, there is a considerable correlation between changes in current dividends and changes in profit at the same time. However, in the first year, there is less of a link between current dividends and changes in profits, and in the second and third years, there is none at all. The study also discovered little evidence that changes in dividend amount and stability are related to future earnings.

There are at least three implications for this study. First, the outcomes can be a reflection of local Malaysian corporations' dividend policy practices. The significance of employing dividends as a predictor of future profitability is not mentioned by the local manager in Malaysia. In other words, the companies' existing dividend policy is not influenced by projections of future earnings. Second, investors should take note of these findings, particularly those who rely on dividend information when making investment decisions. Third, these results supplement the evidence that is required in the Malaysian local market on this subject.

The impact of the dividend policy on the performance of the go public firm on the Ghana Stock Exchange (GSE) was studied by Amidu (2007). The outcome demonstrates a favorable correlation between dividend policy, sales growth, and return on assets (ROA). The findings also provide credence to the notion that the dividend policy has an impact on the business's performance. According to the study's findings, the main GSE companies are performing worse in terms of ROA. The study's findings also showed a negative correlation between leverage, dividend payout ratio, and ROA.

Merekefu and Ouma (2012) looked at the connection between a company's performance on the Nairobi Security Exchange (NSE), Kenya, and its dividend payout. The findings demonstrate that the dividend payment significantly and favorably affects the company's performance.

According to the study's findings, a go public company's dividend policy is primarily influenced by its profitability, historical payout patterns, legal framework, financial leverage, investment prospects, growth rates, and capital structure. Although they will have a significant impact on dividends, other elements such ownership structure, shareholder expectations, shareholder tax, capital structure, growth rates of comparable industries, and access to capital markets can also be taken into consideration when creating a dividend policy.

Ajanthan (2013) investigated the connection between the profitability of the go public hotels and restaurants listed on the Colombo Stock Exchange (CSE), Sri Lanka, and dividend payments. The findings show that dividend distributions significantly affect profitability. This indicates that a rise in a business's financial health typically has a favorable impact on dividend payments. Additionally, this analysis confirms that the company's profitability and income, as well as the relationship between profitability and total assets, are significantly positive.

According to Lintner (2006), senior managers and top management create an estimation model that includes the following factors when deciding on a dividend policy: the size of the company, ownership of the control group, equipment spending, the willingness to use external finance, earning stability, and the usage of stock dividends. A sample of 600 stock exchange-listed companies was employed in the study. He conducted interviews to gather data, albeit not all 600 organizations' managers were questioned for this study. According to the research, the majority of managers said that when deciding on a dividend policy, current income and the target payout—also known as the dividend payout were crucial factors.

2.4.1.6. The Effect of Dividend Policy on Firm Value

The dividend irrelevance theory is supported by a number of empirical investigations. By building a well-diversified portfolio, evaluating the stocks according to their systematic risk, and then classifying them by dividend within each risk category, Black and Scholes (1974) examined the connection between the returns on securities and dividend yields. According to their research, dividends have no bearing on securities returns. Ben Ayed and Zouari (2014) came to the same conclusion: dividends don't affect security returns. Miller and Scholes (2013) offered no proof that a company's dividend policy influences stock prices, while Pettit (2006) also concluded that a company's dividend policy has no bearing on stock prices.

On the other hand, several studies support the "bird in the hand" theory, which posits that investors prefer certain returns over uncertain future gains. Long (2008) examined the case of Citizen Utilities, where two groups of stocks—identical in all aspects except for the dividend treatment were tested. One group received cash dividends, while the other received stock dividends. His findings indicated that shareholders preferred cash dividends. Brigham and Houston (2011) further supported the "bird in the hand" theory, as proposed by Lintner (2006) and Greiner (2015), stating that investors favor high dividends because they reduce uncertainty, in contrast to capital gains, which are not paid out directly.

Baker and Farrelly (2002) surveyed institutional investors to understand key considerations in dividend policy. Their findings indicated that experienced investors believe dividend policy influences stock prices, with dividend stability being a crucial factor. These results align with the work of Lintner (2006). Greiner (2015) also found that companies in developing countries tend to have dividend payout ratios about two-thirds greater than those in developed countries, suggesting that firms in developing markets prioritize dividend policies based on payout ratios rather than monetary magnitudes.

Bajaj and Vijh (2011), in a study spanning 1962 to 1987, showed that dividend yield significantly affects stock price movements, particularly for smaller companies. Due to limited information about these companies, dividend announcements become key signals for shareholders. Allen et al. (2000) and Baker and Wurgler (2004) also suggested that dividend payments often reflect investors' demand for dividends.

According to DeAngelo (2005), dividend policy has a significant impact on shareholder wealth and, consequently, investment choices. According to research by Graham et al. (2005), financial executives are generally hesitant to make significant changes to the dividend policy because doing so could disrupt the capital structure of the firm and have a negative effect on the price of its stock. Ahmed (2017) studied companies listed on the Ghana Stock Exchange (GSE) between 1997 and 2004 to determine whether dividend policy has an impact on a company's financial success. According to Tobin's q, Return on Equity, and Return on Assets, the results validated the idea that dividend policy affects business value.

The tax preference theory put forth by Farrar and Selwyn (1967) is supported by a number of empirical investigations. Brennan (2010) discovered that in order to offset the taxes on

dividends, investors typically want a larger pre-tax return and prefer smaller dividend payouts. Higher dividend-paying equities typically have lower prices, ceteris paribus. Erasmus and Josephine (2014) pointed out that when dividend payments rise, retained earnings fall, forcing businesses to look for outside funding for new projects. However, because of flotation fees, external capital can be expensive. In order to guarantee that money are accessible for lucrative projects that can return positive Net Present Value (NPV), they contended that businesses should minimize dividend payouts as much as feasible.

Using Brennan's (2013) approach, Litzenberger and Ramaswamy (2012) investigated the connection between dividend payments and securities returns. They came to the conclusion that assets with larger dividend payouts had greater risk-adjusted returns. The net profit of a business can be kept as earnings to fund further investments or given as dividends to shareholders. Therefore, dividend policy entails choosing how earnings should be distributed, either as dividends to shareholders or as reinvestment. The percentage of profits that should be dispersed as opposed to retained is decided by the dividend payout ratio.

Brigham and Houston (2011) suggested that managers believe investors prefer companies with stable dividend payout ratios. Regular dividend distributions signal that a company is profitable enough to share earnings with shareholders, which can enhance its perceived value in the market.

Aharony and Swary (2011) examined the effect of dividend and earnings announcements on stock behavior. Their study, which analyzed data from 11-day periods surrounding dividend and earnings announcements, found that dividend announcements provided more valuable information to the market than earnings announcements. This was evident from the positive market reactions to dividend increases and negative reactions to dividend cuts.

Sudjoko (2009) tested the informational content of dividends and assessed market efficiency on the Indonesia Stock Exchange. The study included a sample of 150 companies, categorized into four groups: companies that increased dividends, companies that consistently increased dividends, growing companies that increased dividends, and companies that increased dividends but did not experience growth. The findings indicated that dividend announcements triggered positive market reactions, suggesting that investors on the Indonesia Stock Exchange use dividend information as a tool for decision-making.

2.5. Identified literature gap and Studies conducted in Ethiopia

Numerous studies investigating the relationship between capital structure and firm profitability have yielded conflicting results. Some studies found a negative relationship, others identified a positive relationship, while some revealed no significant relationship at all. This ongoing debate provides an opportunity for further research, particularly in the context of Ethiopian commercial banks. Given that the topic remains contentious, it is an ideal time to analyze the relationship between capital structure and profitability, compare the findings with existing capital structure theories, and determine if any consistent patterns emerge.

The capital structure of Ethiopian commercial banks has been the subject of numerous comparable studies conducted in Ethiopia. Asteraye Tsigehymanot Molla (2022), for instance, looked studied the relationship between leverage and the factors that influence capital structure choices in Ethiopian construction enterprises between 2013 and 2020. Firm-specific variables such profitability, liquidity, asset tangibility, non-debt tax shields, earning volatility (risk), growth prospects, firm size, and firm age were the main focus of this study. Inflation, interest rates, and GDP growth rates were among the external factors taken into account.

Another study, conducted by Tigist Geta Mesfin (2022), examined how capital structure affected the profitability of ten Ethiopian private commercial banks during a nine-year span (2009-2017). The study took into account the maximum number of banks and years for which audited financial statements were available in order to increase the results' generalizability, yielding 90 observations. Return on assets (ROA) and return on equity (ROE) were the dependent variables in this study, which looked at how capital structure affected profitability using independent factors such the debt-to-asset ratio, debt-to-equity ratio, and interest coverage ratio.

In a 2017 study, Yohannes Liku examined how capital structure affected Ethiopian microfinance institutions' (MFIs') financial performance during a six-year span, from 2010 to 2015. This study restricted its focus to elements like the interest coverage ratio, deposit-to-asset ratio, and total debt-to-asset ratio, even though it acknowledged that a wide range of factors affect the financial performance (profitability) of MFIs. To guarantee the accuracy of the regression model, control variables such as business size, age, and loan-to-deposit ratio were employed.

The researcher chose MFIs from Categories A and B, as defined by the National Bank of Ethiopia, in order to increase the findings' generalizability. These institutions were selected because they have higher data availability and quality, larger asset quantities, and market shares (they control more than 95% of the market). Thirteen MFIs, including Amhara Credit and Savings Institutions, Debit Credit and Savings Institutions, Oromia Credit and Savings Institutions, and others in the same categories, contributed 78 observations to the study.

Return on Equity (ROE) and Return on Assets (ROA), two indicators of bank performance, were evaluated by Ashenafi et al. (2013) in relation to a few chosen internal and external corporate governance methods. Using a structured document review, the authors gathered financial information from commercial banks between 2005 and 2011. The results showed that while bank size had a statistically significant beneficial impact on bank performance, board size and the presence of an audit committee on the board had a statistically significant negative impact. Furthermore, an external corporate governance metric that showed a statistically significant positive effect on bank performance was the capital adequacy ratio. Additionally, the study found a number of issues that have a detrimental impact on Ethiopian banks' performance and corporate governance. Among these were the lack of a regulated stock exchange, excessive government interference, ignorance of corporate governance, the absence of national corporate governance guidelines, and inadequate legislative protections for the interests of minority shareholders.

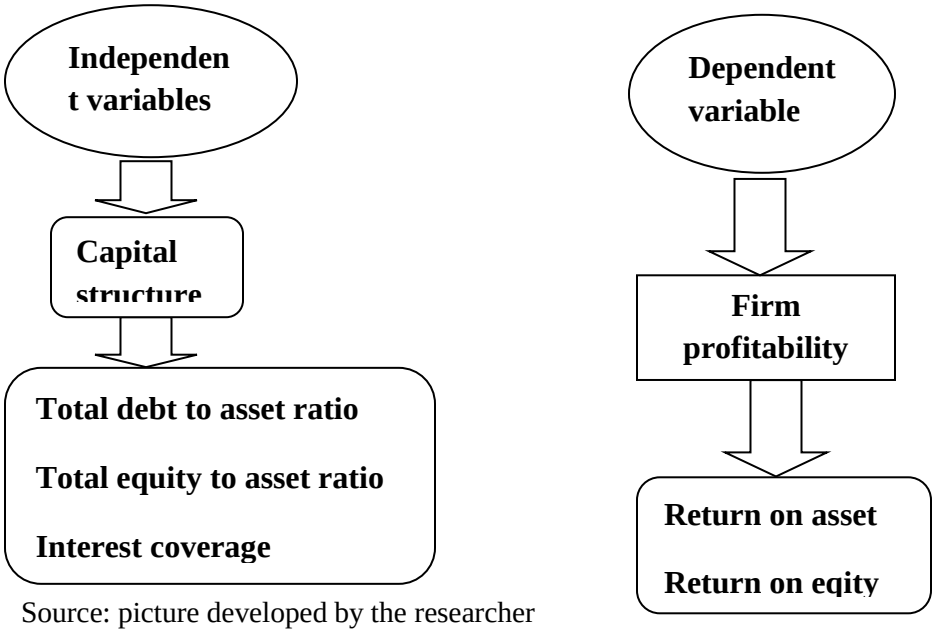
Capital structure has been examined in a variety of Ethiopian studies under various conditions. Asteraye Tsigehymanot Molla (2022), for instance, investigated the connection between leverage and the factors influencing capital structure choices in Ethiopian construction firms. Yohannes Liku (2017) examined the effect of capital structure on the financial performance of microfinance organizations, while Tigist Geta Mesfin (2022) examined capital structure and profitability in private commercial banks. Other studies, such Daniel (2011) in Ethiopian small-scale manufacturing cooperatives and Bayeh (2013) in Ethiopian insurance businesses, have concentrated on the factors that influence capital structure. Shibru et al. (2015) looked into commercial banks, while Saddan (2014) also examined the factors influencing capital structure choices in Ethiopian insurance companies. Research by Muhammad et al. (2015), Aragaw (2015), and Mathewos (2016) looked at how capital structure affected the profitability of

Ethiopian commercial banks, both public and private. Tariku (2016) concentrated on Ethiopia's sizable private manufacturing companies. To the best of the researcher's knowledge, no research has explicitly looked at how capital structure affects Ethiopian commercial banks' profitability. The current study aims to fill this gap.

2.7. Conceptual framework

The following factors are chosen and shown in the conceptual framework created in accordance with the theoretical and empirical research mentioned above, as well as to fulfill the study's goals and take into consideration the environment in which banks function:

Figure2. 1 Conceptual Framework



Source: picture developed by the researcher

CHAPTER THREE

3. METHODOLOGY OF THE STUDY

3.1. Introduction

This chapter outlines the research methodology employed to achieve the study's objectives. It begins by detailing the research design, followed by the approach used to investigate the relationship between capital structure and firm profitability. The subsequent sections describe the study's target population, sampling techniques, data collection methods, and analytical procedures. The chapter also includes the model specification, variable descriptions, and a summary of the expected signs and financial measures for each variable. The aim is to systematically address the research questions.

3.2. Research Design

Research design is the overall framework that connects conceptual research problems to practical and achievable empirical investigations. According to Creswell (2014), it provides specific guidance for the procedures in a study. It is a step-by-step process adopted by researchers before the data collection and analysis stages begin to ensure the research objectives are achieved in a valid manner. In order to provide pertinent answers to research questions at a reasonable cost, the primary goal of research design is to convert a research problem into data that can be studied. The plan, structure, and method of investigation used to find answers to research questions while preserving the best possible control over variables is known as research design, according to Kerlinger (2006). Profitability is the dependent variable and capital structure proxies are the independent variables in this study, which looks at the cause-and-effect relationship between capital structure and profitability in Ethiopian commercial banks. The design of this study is explanatory.

The method and measurement that yields quantifiable/discrete values is known as a quantitative research strategy (Kothari, 2007). The information gathered is the outcome of empirical measurements and observations. These techniques take a significant amount of preparation and time. Their answers are usually closed-ended.

"Quantitative researchers regard the world as being outside of themselves and there is an objective reality which is independent of any observations" (Rovai, Baker, & Ponton, 2014).

They go on to say that in order for this objective reality to be comprehended for the sake of the research study, it must be divided into small, manageable parts that make up the research objectives or hypothesis. The researcher can create data or test hypotheses using a variety of data gathering techniques thanks to the correlations between the variables in the objectives. After a series of data analyses, conclusions can be made regarding the goals or hypotheses. Mathematical and statistical techniques that concentrate on experimental or non-experimental approaches to gathering numerical data and extrapolating the studied results to the study population are used in the data collection and analysis process. The post-positivist worldview is the foundation of this approach (Phillips & Burbules, 2010).

The designs of quantitative studies are precise, organized, and have undergone validity and reliability testing. These designs are recognizable and easily distinguished. The requirement for accurate data measurement and classification in quantitative research necessitates more rigorous, permanent, and planned study designs. This ensures accuracy in both measurement and classification. Furthermore, quantitative study designs make it easier to distinguish between different research designs and data collection techniques (Kumar, 2011).

Li Yuqi (2007) cites Stewart and Kamins (2003) as saying that secondary data have a number of benefits. In particular, secondary data offer a consistent source of information that is easily accessible and verifiable by others, improving the data's quality and dependability. Therefore, the audited financial statements released by the National Bank of Ethiopia, Office of Microfinance Supervision Directorate, provided information on the capital structure and financial performance (profitability) metrics of microfinance organizations for this study. Only audited financial statements more especially, the income statement and balance sheet—were used in order to reduce the possibility of data falsification.

Conversely, qualitative research aims to investigate and comprehend the interpretations that people or groups make on social or human issues (Creswell, 2014). Anthropology, sociology, the humanities, and evaluation are its historical foundations. Open-ended questions are frequently used to gather non-quantifiable data for qualitative research. By examining problems in their

particular context and the meanings that people ascribe to them, this method enables researchers to comprehend problems (Denzin & Lincoln, 2005). Its primary goal is to provide reality, purpose, or insights based on participant experiences and viewpoints (Merriam, 2009).

The main presumptions of qualitative research, which is usually inductive, are that reality is socially created, variables are intricate, interconnected, and challenging to quantify, and the information gathered represents an insider's viewpoint (Rovai et al., 2014). This method offers a wide range of knowledge that is rich in context and substance and promotes individuality, culture, and social justice. Despite being subjective, this information is frequently up to date. In qualitative research, participation, observations, and interviews are common techniques for gathering data.

The quantitative research approach is thought to be the most suitable for this study due to the quantitative nature of the financial data (i.e., the statement of profit and loss and the statement of financial position of selected Ethiopian commercial banks) and the previously stated research problem and objectives. The study makes use of the financial data gathered by a document survey, and its objectives are in line with the quantitative research philosophy.

The research sample includes nine Ethiopian commercial banks, selected from a total of 30 institutions categorized by the National Bank of Ethiopia. Therefore, this study uses panel data from nine Ethiopian commercial banks over a period of nine years (2015 to 2023), based on their financial statements.

3.3. Study Population

The population of this study comprises all Ethiopian commercial banks. According to the most recent annual report of the National Bank of Ethiopia (NBE), there are 30 (thirty) commercial banks currently operating in the country. These include: Dashen Bank S.C (DB), Awash International Bank S.C (AIB), Wegagen Bank S.C (WB), Commercial Bank of Ethiopia (state-owned), Nib International Bank S.C (NIB), Bank of Abyssinia S.C (BOA), Lion International Bank S.C (LIB), Cooperative Bank of Oromia S.C (COOP), Berhan Bank S.C (BB), Buna International Bank S.C (BUIB), Oromia International Bank S.C (OIB), Zemen Bank S.C (ZB), Addis International Bank S.C (AdIB), Abay Bank S.C (AB), Enat Bank S.C (EB), Hibret Bank S.C (formerly United Bank), Development Bank of Ethiopia (DBE), ZamZam Bank, Hijra Bank, Siinqee Bank, Amhara Bank, Ahadu Bank, Goh Betoch Bank S.C, Tsedey Bank, Tsehay Bank, Gadaa Bank, Shebelle Bank, National Bank of Ethiopia (central bank, not typically considered a commercial bank), and Debub Global Bank S.C (DGB).

3.4. Sample and Sampling Techniques

A sample is essentially a subgroup of the population under study (Kumar, 2011). Purposive sampling, also known as judgmental, selective, or subjective sampling, is a technique that relies on the researcher's judgment in selecting the units (such as people, organizations, events, or data points) to be studied. Various purposive sampling techniques include maximum variation sampling, homogeneous sampling, typical case sampling, extreme (deviant) case sampling, total population sampling, and expert sampling (Sharma, 2017). For this study, in order to make generalizations from the sample to the population, the researcher employed a maximum combination of years and banks, thereby achieving the highest number of observations using the purposive sampling technique.

These banks were selected because they met the criteria of having a complete set of annual financial statements for the study period, ensuring the reliability and consistency of the data. The selection criteria aimed to ensure that the sample was a representative subset of the overall population of Ethiopian commercial banks. Data were collected primarily from the audited annual financial statements of the selected banks. This allowed the researcher to generate a total of 81 firm-year observations (9 years × 9 banks) for the period under review.

NBE's June 2021/2022 annual report states that the sample banks' market shares in terms of capital and branch network were 58.5% and 76.1%, respectively. Nonetheless, public banks have the remaining 41.5% of the Ethiopian banking sector, while private banks hold 58.5% of the market. Additionally, they have solid banking operations experience, and the sample size includes 72.5% of the nation's 23 private commercial banks. As a result, it is thought to generalize from sample to population.

3.5 Methods of Data Collection

Data for this study were collected from secondary sources by reviewing the audited annual financial statements of selected Ethiopian commercial banks. The data collection covered a nine-year period (2015–2023), which is considered sufficient to establish a meaningful association between capital structure and profitability in the context of registered Ethiopian commercial banks. Only banks that have been actively operating throughout this period were included in the study to ensure consistency and completeness of the data.

Given that the National Bank of Ethiopia (NBE) serves as the regulatory authority for financial institutions in the country, secondary data obtained from NBE are regarded as highly credible. In addition to data from NBE, the researcher collected audited financial statements and annual reports directly from the respective banks. This approach enhances both the reliability and validity of the data used in the analysis. To ensure data accuracy, all collected documents were reviewed for completeness, consistency, and accuracy prior to statistical analysis. The use of audited financial reports further strengthened the credibility of the research findings.

3.6. Method of Data Analysis

The researcher mostly used quantitative analysis to accomplish the study's goals. The impact of capital structure on firm profitability in Ethiopian commercial banks was investigated using an econometric model. In particular, the EViews 8 econometric software package was used for the study, and the Generalized Least Squares (GLS) approach was used. Regression analysis is a statistical method for characterizing and assessing the connection between a dependent variable and one or more independent variables, according to Brooks (2008). A panel data regression model was used in this study to evaluate how capital structure affected Ethiopian commercial banks' profitability.

Descriptive statistics, comprising measurements like mean values, maximum, minimum, and standard deviations, were used to examine the panel data regression results. Furthermore, multiple linear regression and correlation analysis were used to look at general patterns in the data gathered from the banks that were sampled. The associations between the independent/explanatory variables and the dependent variable were investigated using a correlation matrix. Several diagnostic tests, such as tests for heteroskedasticity, autocorrelation, multicollinearity, and residual normality, were carried out to confirm the validity of the Ordinary Least Squares (OLS) model.

3.7. Model Specification

In this study, the effect of **capital structure** on the **profitability** of Ethiopian commercial banks was examined using a **multiple regression model**. The general form of the model is as follows:

$Yi=\alpha+\beta 1X1i+\beta 2X2i+\cdots+\beta kXki+\epsilon i, \qquad i=1,2,\ldots,n$
Where; Yi is the dependent variable,

$ROAit = \alpha+ \beta 1TDA\ it + \beta 2IC\ it+ \beta 3Ln\ (SIZE)\ it+ \beta 4Tangit + \beta 5INF+ \varepsilon it$

$ROEit = \alpha+ \beta 1TDA\ it + \beta 2IC\ it+ \beta 3Ln\ (SIZE)\ it+ \beta 4\ Tangit + \beta 5INF+ \varepsilon\ it$

Where;

ROA=Rate of return on Asset ROE=Return on equity

α, = the constant term and $\beta 1$, $\beta 2$, $\beta 3$, $\beta 4$, and $\beta 5$ = the coefficients of each independent variables

TDA = Debt to Asset ratio

IC = Interest coverage ratio

(SIZE) = Natural logarithm of total asset

Tang = Tangibility of banks

INF = Annual inflation rate of Ethiopia

E it = the error term of firm i at year t

3.8 Variable Presentation

The research will focus on both independent and dependent variables. Return on equity (ROE) and return on assets (ROA) will be used to measure profitability, which will be regarded as a dependent variable. The independent variable will be capital structure, which will be proxied by the debt to equity ratio, the debt to asset ratio, the interest coverage ratio, and bank-specific control variables, such as tangibility and bank size. Inflation was also employed as a macro-level element. Here is a breakdown of the independent and dependent variables.

3.8.1. Dependent Variable

The dependent variable in this study is bank profitability. Three alternative metrics are frequently used to assess bank performance: net interest margin (NIM), return on equity (ROE), and return on assets (ROA). One or a combination of these ratios are frequently used as profitability indicators in studies looking at how capital structure affects bank profitability. Mohana and Tekeste (2012) state that because the output of each financial performance ratio varies, the choice of financial performance ratios (ROA, ROE, and NIM) depends on the particular goal of the performance measure. Because ROA and ROE are significant, accounting-based, and generally recognized indicators of financial performance, they were selected for this study among the available options for gauging bank profitability.

The ability of a bank's management to make money off of its assets is shown by the return on assets, or ROA. Although it may be impacted by off-balance-sheet activities, it displays the profits made per birr of assets and illustrates how well a bank's assets are managed to create revenue. Because it shows the returns on the assets the bank possesses, ROA is regarded as one of the most crucial ratios for evaluating the effectiveness and operational performance of banks (Tan and Floros, 2012). The most thorough accounting indicator of a bank's overall performance is its return on assets (ROA). Numerous studies have used ROA as a performance metric because of its applicability. For example, Sufian (2011), Amdemichael (2012), Mathewos (2016), Mohana and Tekeste (2012), and Tamrat (2015) have all calculated ROA using the following formula:

$$\textbf{ROA} = \frac{\textbf{Net Income}}{\textbf{Total Asset}}$$

Return on Equity (ROE), which is typically taken into account in conjunction with ROA, is another widely used indicator of profitability. According to Fitsum and Asmerom (2016), ROE is computed by dividing net income by average shareholders' equity. Because it displays the financial return on their investment in the bank, this metric is especially important to shareholders. In contrast to banks that rely more on shareholder equity, those that rely more on deposits and borrowings to sustain their assets typically have higher ROEs. The most generally used profitability statistic is ROE, which is an internal performance measure of shareholder value. It is easily accessible to analysts, depending solely on publicly available data. enables comparisons between various businesses or economic sectors. ROE is frequently further broken down into individual drivers, a procedure known as "DuPont analysis." The net profit margin is represented by the first component of this decomposition, while the financial leverage multiplier is represented by the last component (European Central Bank, 2010). The following formula has been used by Mathewos (2016) and Fitsum and Asmerom (2016) to compute ROE as a measure of bank performance:

$$\textbf{ROE} = \frac{\textbf{Net Income}}{\textbf{Total Equity}}$$

3.8.2. Independent Variables

The explanatory (independent) variables in this study are the debt-to-asset ratio, debt-to-equity ratio, and interest coverage ratio. These variables serve as proxies for capital structure.

The **debt to asset ratio** is a financial metric that indicates the proportion of a company's debt relative to its total assets. It shows how much the company relies on debt to finance its assets. A higher ratio suggests greater reliance on debt, which increases the risk associated with the firm's operations otherwise the opposite. This ratio is calculated by dividing total liabilities (both long-term and short-term) by total assets:

Debt to Asset ratio = Total Liabilities / Total Assets

The debt to equity ratio calculates how much of the company's activities are financed by debt in relation to shareholders' equity, or net worth. It gives information about the proportion of funds raised through debt as opposed to equity. The more aggressively a corporation uses debt to finance its expansion, the greater the debt-to-equity ratio. Due to higher interest costs and possible liquidity issues brought on by principle repayments, this could result in inconsistent earnings. A high ratio, however, may result in greater returns on equity if properly managed.

Debt to Equity Ratio = Total Liabilities / Total Equity

The Interest Coverage Ratio (ICR) measures a company's ability to meet its interest payments on outstanding debt. It is calculated by dividing a company's Earnings Before Interest and Taxes (EBIT) by its interest expenses over a specific period, typically one year. This ratio indicates how many times the company can cover its interest payments with its earnings. A higher ICR signifies stronger financial health and a greater capacity to service debt, while a lower ratio suggests potential financial stress. If the ratio falls below 1.0, it indicates that the company is not generating sufficient earnings to cover its interest obligations, which could lead to liquidity issues or, in extreme cases, bankruptcy.

Interest Coverage Ratio = EBIT / Interest expense

A lower interest coverage ratio (ICR) indicates a higher debt burden for the company and a greater likelihood of bankruptcy or default. Specifically, a lower ICR signifies that the company has fewer earnings available to cover its interest payments, making it more vulnerable to fluctuations in interest rates. When a company's ICR falls to 1.5 or below, its ability to meet interest expenses becomes questionable. An ICR below 1.0 suggests that the company is struggling to generate enough cash to fulfill its interest obligations, as its interest payments exceed its earnings before interest and taxes (EBIT).

3.8.3. Control Variables

Several factors, aside from capital structure proxies, influence a bank's profitability. There are, A frequent control variable is **firm size**, which is usually calculated using the natural logarithm of total assets (Kodongo et al., 2014; King & Santor, 2008). This metric is commonly used in prior research since it offers a trustworthy representation of a company's size. The total of net fixed assets, total intangibles, total investments, net current assets, and other assets is known as

total assets. The purpose of firm size analysis is to determine whether a company's size and performance are related. According to the trade-off argument, larger companies are less likely to be liquidated, have better reputations, are more diversified, have less risks, and have more consistent cash flows. These elements make it simpler for big businesses to access capital markets with comparatively cheap financing charges, which increases their ability to withstand financial difficulties or insolvency. As a result, it is anticipated that business size and debt levels will positively correlate.

Firm Size = Natural logarithm of total asset

Or

Bank Size=Ln (Total Asset)

The percentage of a company's assets that are tangible is referred to as tangibleness in the context of capital structure. There is a conflict of interest between debt suppliers and shareholders, which raises the possibility of moral hazard and adverse selection, claim Jensen and Meckling (2014). Lenders may therefore demand collateral, and the fixed-to-total-assets ratio is frequently used as a stand-in for the collateral value of a company's assets. According to Stiglitz and Weiss (2008), Williamson (2012), and Harris and Raviv (2010), companies with more physical assets are probably worth more when it comes to liquidation, which could make it easier to get debt financing. Because they can pledge physical assets as collateral, capital-intensive businesses typically use more debt (Myers, 2016).

Studies have indicated that a firm's capital structure decisions are significantly influenced by the tangible nature of its assets. Investigating the connection between tangibility and capital structure in Ethiopian commercial banks is the goal of this study. Results for Pakistani small, medium, and big businesses varied, according to Akhtar et al. (2016). Tangibility and capital structure were negatively correlated for small businesses and positively correlated for large businesses. In addition, medium-sized businesses typically employed lower interest rates than tiny businesses. The idea that long-term assets are utilized for long-term financing while short-term assets are used for short-term financing is supported by this study.

Tangibility= Fixed asset / Total asset

3.8.5. Summary of Variables

Variables	Full Name	Measure	Expected sign/ impact of independent variables on ROA and ROE
Dependent			
ROA	Return on Assets	Net Income / Total Assets	
Independent			
TD	Total Debt Ratio	Total Liabilities / Total Asset	
DER	Debt to Equity Ratio	Total Liabilities / Total Equity	
Icr	Interest coverage ratio	EBIT / Interest expense	
Controls			
SIZE	Firm Size (SIZE)	Log of Total Assets	
Tangibility	Tangibility	Fixed asset / Total asset	

Table3. 1 Description of variables and their expected sign

CHAPTER FOUR

4. ANALYSIS AND DISCUSSION

The previous chapter outlined the study methodology employed to achieve the research's objectives. This chapter presents the results and analysis of the findings, along with a discussion of the results. The chapter is organized into four sections. The first section provides a summary of the descriptive statistics. The second and third sections focus on the Classical Linear Regression Model assumptions tests and the results of the regression analysis, respectively. The fourth section summarizes the key findings of the study.

4.1. Descriptive information

This phase affords the descriptive statistics of dependent and independent variables used in the research for the sample Ethiopian commercial banks. The dependent variable used on this study was into ROA and R OE at the same time as the independent variables are debt to asset ratio, debt to equity ratio, interest coverage ratio, tangibility, firm size and inflation.

Thus, the total observation for each de pendent and independent variable was 81 (panel data of 9 Ethiopian commercial banks for 9 years). The table 4.1 demonstrates the mean, median, maximum, minimum and standard deviation values for dependent and independent variables for sample Ethiopian commercial banks over the year 2015-2023.

	ROA	ROE	DTAR	DTER	INC	FS	TAN	INF
Mean	0.025	0.216	0.892	7.608	1.097	4.656	0.035	0.186
Median	0.026	0.199	0.871	6.724	1.097	4.582	0.030	0.158
Maximum	0.038	0.719	1.149	19.27	2.601	6.116	0.072	0.339
Minimum	0.003	0.025	0.823	4.643	0.132	3.653	0.008	0.066
Std. Dev.	0.006	0.091	0.071	2.947	0.422	0.553	0.017	0.092
Skewness	-0.647	3.104	2.537	2.380	0.542	0.826	0.610	0.363
Kurtosis	3.838	16.748	8.803	8.431	3.806	3.436	2.335	1.704
Jarque-Bera	8.033	767.967	200.524	175.988	6.162	9.853	6.508	7.447
Probability	0.018	0	0	0	0.046	0.007	0.039	0.024
Sum	2.0506	17.494	72.263	616.259	88.842	377.099	2.823	15.106
Sum Sq. Dev.	0.0033	0.661	0.405	694.703	14.247	24.476	0.022	0.682
Observations	81	81	81	81	81	81	81	81

Table4. 1 Descriptive Statistics of Dependent and Independent Variables

Source: Annual report of sample banks computed using EViews 8

Researcher analyzed the Ethiopian commercial banks using two profitable indicators of return on equity (ROE) and return on asset (ROA). As measured in the above table 4.1, the mean, of Return on Asset (ROA), measure of profitability (dependent variable) which is measured by dividing Net Income by Total Asset. As indicated in the table above table 4.1, the mean value of return on assets (ROA) was 0.025 its standard deviation was 0.006 and its maximum and minimum value was found to be 0.038 and 0.003 respectively. The positive return on assets indicates that some banks were generating profit.

The results in table 4.1 further indicate that Return on equity (ROE), measure of profitability (dependent variable) which is measured by dividing Net Income by total equity of the Ethiopian commercial banks had a mean value of 0.216 and standard deviation of 0.091. The maximum observed value indicated by return on equity was 0.719 while the minimum value was 0.025, positive return on equity means that some Ethiopian commercial banks were generating profit (ROE). From results in table 4.1, mean value of return on asset was (2.5%) while the mean value of return on equity was (21.6%), this indicate that contribution of shareholders fund (equity) on generating banks income is greater than contribution of company assets in generating banks income in nine years' time. These results also mean that Ethiopian commercial banks have less utilization of assets to generate profit than shareholders fund or bank equity.

From capital structure ratios, researcher revealed the following results from the descriptive statistics shown in table 4.1, above represented by total debt to total asset ratio (TDA), total debt to equity ratio (TDE) and interest coverage ratio (IC) also used as a third measure of capital structure of banks to examine the effect of TDA, TDE and IC on profitability of Ethiopian commercial banks. The mean of DTAR, DTER, IC, and of the sampled banks in the study was 0.892 and 7.608 and 1.097 and respectively.

DTAR has a mean value of 0.892. The mean value shows that during the study period the sample Ethiopian commercial banks finance their total assets by using 89.2% of debt. In addition, the greatest standard deviation of 0.071 signifies a great variation in total debt as evidenced by maximum observed value of 1.149 against the minimum value of 0.823. This indicates that in the study period the sample banks have variation in using debt and equity on their total assets or finance their operation. In general, the mean value of debt to total asset ratio 89.2%, indicates the fact that banks are highly levered institutions in Ethiopia.

The mean value 7.608 shows that during the study period the sample banks finance their capital structure by using 760.8% debt equity in their capital structure. It also revealed that on average the banks in Ethiopia are more debt than equity financing. The ratio shows on average 7.608 times more debt than equity capital in the banks' capital structure. The result indicates that banks in Ethiopia use more debt financing than equity financing.

The interest coverage ratio (IC) has with a mean value of 1.097. This result indicates that on average the sample banks are more capable to meet their interest obligations from operating earnings and also indicates that banks in Ethiopia are having fewer burdens of interest expenses.

The standard deviation of interest coverage ratio (IC) of sample banks under this study is 0.422, which implies that banks are able to cover their interest payments with their EBIT in a regular manner.

As it is shown in table 4.1 above, the control variable in this study was bank size and tangibility. Which have mean values of 4.656 and 0.035 respectively and a maximum value of 6.116 and 0.072 respectively. Whereas; the minimum values were 3.653 and 0.008 respectively. In addition, the standard deviation of the bank size and tangibility were 0.553 and 0.017 respectively. This implies that in the study period the sample Ethiopian commercial banks on average have a variation in their total asset and fixed asset respectively.

According to descriptive statistics shown in the above table 4.1, considers inflation as a macro-economic factor, general inflation rate, had a high standard deviation of 9.2 % this implies that inflation rate in Ethiopia during the study period remains unstable. The mean value of the general inflation rate of the country over the past nine years was 18.6 %. Whereas; the maximum and minimum values of inflation were 33.9% and 6.6% respectively. In general, the descriptive statistics above indicate that sample Ethiopian commercial banks contribution of equity (Shareholders fund) in generating profit (21.6%) was greater than contribution of asset on generating company profit (2.5%).

4.2. Correlation Evaluation

Correlation analysis well-known shows the linear dating among the dependent variable (financial overall performance) and explanatory variables, which includes both independent and control variables, through the usage of a correlation matrix. This matrix helps quantify the extent to which quantitative variables dependent and independent —move together. The values of the correlation coefficient constantly variety from -1 to +1. The sign of the correlation coefficient suggests whether or not the correlation is positive or negative (direct or inverse), while the value of the coefficient reflects the strength of the correlation. Particularly, a correlation coefficient close to +1 indicates a strong positive correlation, while a coefficient close to -1 suggests a strong negative correlation between the variables. Conversely, if the coefficient approaches zero (0), it suggests little or no linear relationship between the variables. Therefore, the analysis of the relationships between the dependent variables (ROA and ROE) and the independent variables (DTAR, DTER, ICR, FSIZE, TAN, and INF) is presented in detail in Table 4.2, as shown in the correlation matrix.

	ROA	ROE	DTAR	DTER	IC	FS	TAN	INF
ROA	1							
ROE	0.4227	1						
DTAR	0.0591	0.3841	1					
DTER	-0.3259	0.6158	0.4138	1				
IC	0.7757	0.6409	0.1243	-0.0100	1			
FS	0.4000	0.3633	0.2908	0.7315	-0.2661	1		
TAN	-0.1753	-0.3273	-0.0318	-0.2539	-0.3776	-0.1446	1	
INF	-0.1811	-0.1264	-0.1068	0.0952	-0.4612	0.4859	0.0088	1

Table4. 2 Correlation Matrix for Dependent and Independent Variables

Source: Annual report of sample banks computed using EViews 8

This study calculated the correlations between the dependent variables and the independent, control, and macroeconomic variables. Table 4.2 presents the correlation coefficients among the six profitability measures, tangibility, and the control variables of the study. As indicated by various finance literatures and observed in the real world, an efficient capital structure is expected to enhance a bank's profitability. Therefore, a negative correlation between tangibility

and the profitability measures (i.e., ROA, ROE, DTAR, DTER, and IC) of Ethiopian commercial banks might be anticipated.

From Table 4.2, it can be observed that the correlation coefficients of tangibility with ROA, ROE, DTAR, DTER, IC, and firm size are -17.53%, -32.73%, -3.18%, -25.39%, -37.76%, and -14.46%, respectively. These results suggest that a shorter tangibility period is associated with higher profitability, whereas a longer tangibility period is linked to lower profitability.

Additionally, as shown in Table 4.2, a positive correlation exists between firm size and the profitability measures, including the debt-to-equity ratio. Specifically, the correlation coefficients are 40% with ROA, 36.33% with ROE, 29.08% with DTAR, and 73.15% with DTER. Moreover, the table indicates that the Interest Coverage Ratio (ICR) is strongly and positively related to ROA, ROE, and DTAR, with correlation coefficients of 77.57%, 64.09%, and 12.43%, respectively. However, the correlation between ICR and DTER is weak and negative, at -1%. Furthermore, inflation shows negative correlations with ROA, ROE, DTAR, and ICR, while it exhibits positive correlations with DTER, firm size, and tangibility.

4.3. Classical Linear Regression Model (CLRM) Assumptions and Diagnostic Test

In order to prepare the data for regression analysis, the most critical assumptions related to the Classical Linear Regression Model (CLRM) were tested. These tests were conducted to determine whether any of the assumptions of the CLRM were violated. The following sub-sections present the results of these tests:

4.3.1. Test for Heteroskedasticity assumption (var (ut) = $\sigma 2 < \infty$)

According to Brooks (2008), this assumption requires that the variance of the error terms stays constant throughout observations, referred to as homoscedasticity. If the variance of the errors isn't constant, this suggests a violation of the assumption, that's known as heteroskedasticity. to test for heteroskedasticity in this study, White's test was employed. This test examines whether or not the error variance remains consistent across the range of explanatory variables for both ROA and ROE independently.

H0: The variance of the error is homoscedasticity

Heteroskedasticity Test: White

F-statistic	2.460016	Prob. F(27,53)	0.0025
Obs*R-squared	45.05138	Prob. Chi-Square(27)	0.0161
Scaled explained SS	64.48750	Prob. Chi-Square(27)	0.0001

Table4. 3 Heteroskedasticity Test for ROA

Heteroskedasticity Test: White

F-statistic	5.001473	Prob. F(27,53)	0.0000
Obs*R-squared	58.16972	Prob. Chi-Square(27)	0.0005
Scaled explained SS	48.93381	Prob. Chi-Square(27)	0.0060

Table4. 4 Heteroskedasticity Test for ROE

Source: - annual report of sample Ethiopian commercial banks computed using E-views 8

The above table 4.3 and 4.4 show that Whit's test of Heteroskedasticity. As it is clearly revealed in table 4.3 and 4.4, the explanatory powers of the two dependent variable Obs*R-squared are 45.05 percent and 58.17 percent respectively. This is a signal that the variability of the variables used in the models causes 45.05 percent of the changes in the return on assets and 58.17 percent of variability in the return on equity. The remaining 54.95 percent changes on return on asset and 41.83 percent changes on Return on equity reflect the portion which isn't always defined by the variables included in the models. Furthermore, the overall significances of the two dependent variables when measured by their respective F statistics are 2.46 and 5.0 with P-values of 0.0025 and 0.0000 for ROA and ROE respectively. Which indicate that correct /significance/ of autocorrelation for ROA and ROE are well fitted significance of autocorrelation and the p value is less than 0.05, and also the third version of the test statistic, 'Scaled explained SS', which because the name shows is primarily based on a normalized model of the defined sum of squares from the auxiliary regression, indicates additionally that there is sufficient evidence of Heteroskedasticity. Thus, the conclusions of the tests have shown that evidence of Heteroskedasticity and the null hypothesis is rejected.

4.3.2. Assumption two: covariance between the error terms over time is zero (cov (ut, uj= 0)

in this study, each the Durbin-Watson (DW) and Breusch-Godfrey checks have been hired to test for the presence of autocorrelation inside the two dependent variables, ROA and ROE, independently.To account for any autocorrelation, lagged values of the variables have been included in the analysis. According to Brooks (2008), a lagged value refers to the value that a variable assumes in a previous period. Based on the regression results, the Durbin-Watson statistics were found to be 1.294369 for ROA and 1.243544 for ROE, both of which are close to the value of 1. This suggests that autocorrelation is not a significant issue in the regression analysis.

Furthermore; Breusch-Godfrey take a look at turned into conducted to test the existence of autocorrelation for the two variables independently

Dependent Variable: ROA
Method: Least Squares
Date: 03/26/25 Time: 21:36
Sample: 1 81
Included observations: 81

R-squared	0.786726	Mean dependent var	0.025316
Adjusted R-squared	0.769433	S.D. dependent var	0.006432
S.E. of regression	0.003088	Akaike info criterion	-8.639949
Sum squared resid	0.000706	Schwarz criterion	-8.433022
Log likelihood	356.9180	Hannan-Quinn criter.	-8.556927
F-statistic	45.49521	Durbin-Watson stat	1.294369
Prob(F-statistic)	0.000000		

Table4. 5 Method: Least Squares ROA

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	4.772212	Prob. F(2,72)	0.0113
Obs*R-squared	9.480702	rob. Chi-Square(2)	0.0087

Table4. 6 Breusch-Godfrey Serial Correlation LM Test: ROA

Dependent Variable: ROE
Method: Least Squares
Date: 03/26/25 Time: 22:18
Sample: 1 81
Included observations: 81

R-squared	0.833045	Mean dependent var	0.215977
Adjusted R-squared	0.819508	S.D. dependent var	0.090932
S.E. of regression	0.038632	Akaike info criterion	-3.587031
Sum squared resid	0.110438	Schwarz criterion	-3.380104
Log likelihood	152.2748	Hannan-Quinn criter.	-3.504009
F-statistic	61.53873	Durbin-Watson stat	1.243544
Prob(F-statistic)	0.000000		

Table4. 7 Method: Least Squares on ROE

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	4.489562	Prob. F(2,72)	0.0145
Obs*R-squared	8.981438	Prob. Chi-Square(2)	0.0112

Table4. 8 Breusch-Godfrey Serial Correlation LM Test: ROE

Source: - annual report of sample bank computed using EViews 8

The above tables 4.6 and table 4.8 show test of autocorrelation after inclusion of lagged variable and p value is less than 0.05 and which indicates that correct of autocorrelation for both ROA and ROE.

4.3.3. Assumption three: normality (errors are normally distributed (ut ~ N (0, σ2))

(Brooks, 2008) said also that if the residuals are typically distributed, the histogram ought to be bell-shaped and the Jarque-Bera statistic would be giant. That is, the p-values given at the bottom of the normality test screens should be less than 0.05 to reject the null hypothesis normality at the 5% significant level for 0.000487 ROA. But in this case the problem of Normality is not significant since the p- value 0.936193 for ROE which is much more greater than 0.05.

As shown in the graph 4.1 below ROA kurtosis approaches to 4 (i.e. 4.430079), and the Bera-Jarque statistic p-value was significant even at 5% significance level as per the P values shown in the histogram below, has a P-value of 0.000487. Hence, the null hypothesis that is the error term is normally distributed should be rejected and it seems that the error term in all of the cases

follows the normal distribution. So, the residuals are normally distributed in this study, concluded that there is the problem of normality on models.

As shown in the figure 4.2 below ROE kurtosis approaches to 3 (i.e. 3.015805), and the Bera-Jarque statistic p-value was not significant even at 5% significance level as per the P values shown in the histogram below, has a P-value of 0.939193. Hence, the null hypothesis that is the error term is normally distributed should not be rejected and it seems that the error term in all of the cases follows the normal distribution. So, the residuals are normally distributed in this study, concluded that there is no problem of normality on models.

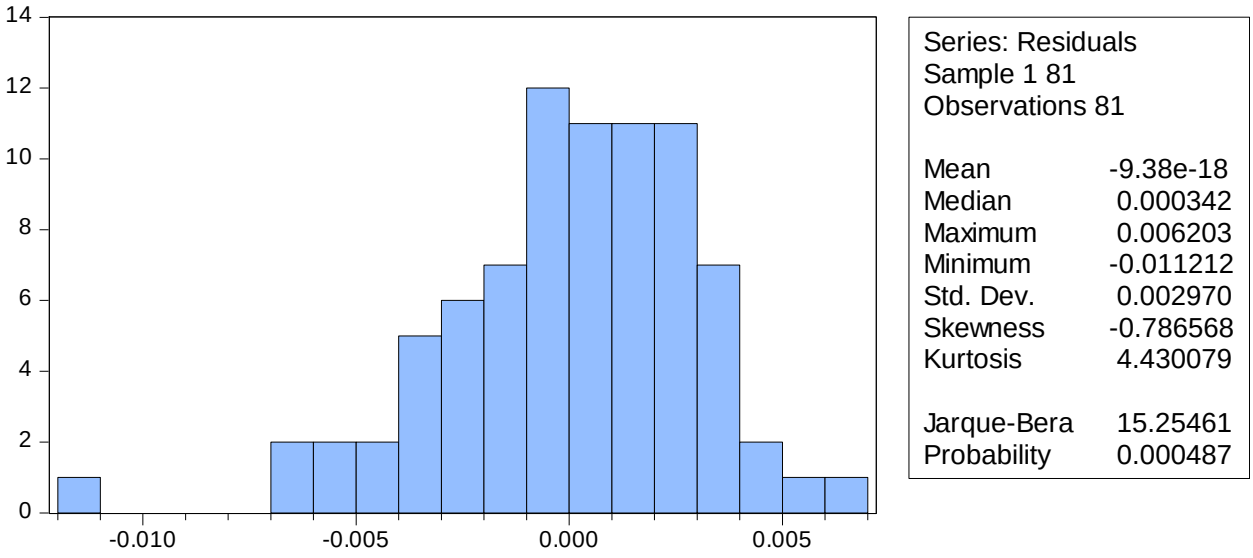


Figure 4-1 Dependent Variable ROA

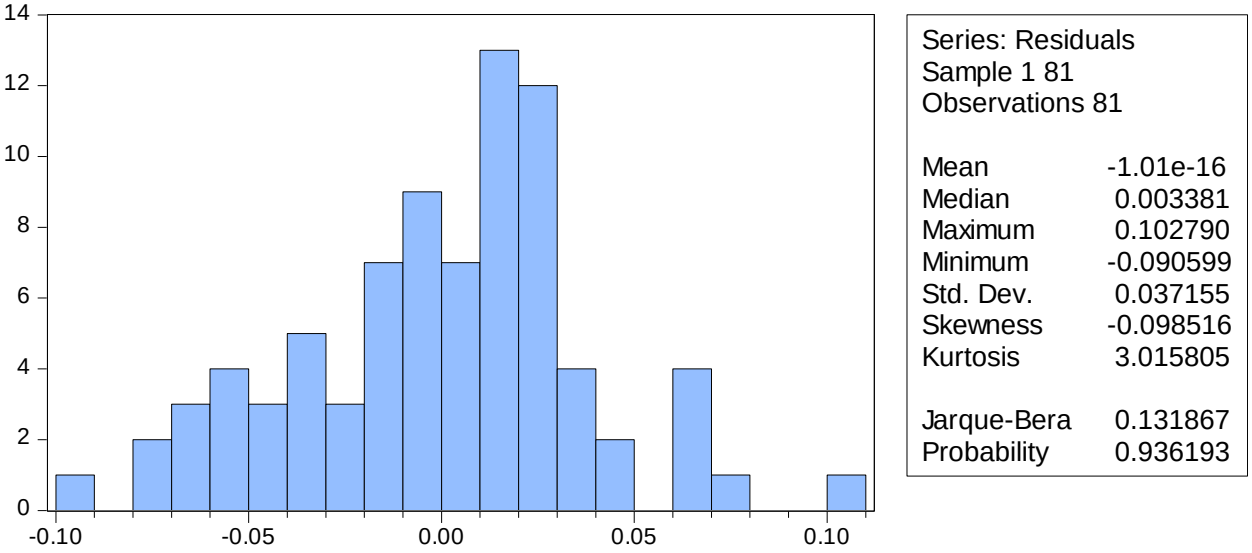


Figure 4-2 Dependent Variable ROE

Source: - annual report of sample bank computed using EViews 8

The diagram figure 1 and 2 witnesses that normality assumption holds the coefficient of kurtosis were ROA 4.430 and ROE 3.015 which close to 4 and 3 respectively, the ROE kurtosis of 3 indicate a normal distribution , skewness were ROA loss 0.786 and ROE loss 0.098 which are both ROA and ROE close to zero. These imply that the data were consistent with a normal distribution assumption both kurtosis and kurtosis are closer the value is zero. Based on the statistical result, the study to reject the null hypothesis of normality.

4.3.4. Multicollinearity Test

Multicollinearity while the explanatory variables are particularly correlated with each other, which can complicate the estimation of regression coefficients. There are two types of multicollinearity: perfect multicollinearity and near multicollinearity. Perfect multicollinearity takes place while there may be an precise courting among two or extra variables, making it impossible to estimate all the coefficients in the model. This situation typically arises when the same explanatory variable is unintentionally included multiple times in a regression. On the other hand, near multicollinearity is more common in practice, occurring when there is a strong, but not perfect, correlation between two or more explanatory variables.

To assess the potential degree of multicollinearity the various explanatory variables and determine their independence, the study employed a correlation matrix of the independent variables. This allows for the detection of any multicollinearity issues in the regression model.

	DTAR	DTER	IC	FS	TAN	INF
DTAR	1					
DTER	0.413819	1				
IC	0.124296	-0.00997	1			
FS	0.290842	0.731525	-0.26612	1		
TAN	-0.0318	-0.25389	-0.37759	-0.14459	1	
INF	-0.10677	0.095179	-0.46116	0.485937	0.008775	1

Table4. 9 Tests for Multicollinearity

Source: - annual report of sample bank computed using EViews 8

As shown above in table 4.9, there is multicollinearity problem among the explanatory variables as the maximum correlation coefficient is 0.734049 involved between **firm size** and **DTER**. As a

result the researcher excludes DTER for the regression model in order to solve multicollinearity. Table 4.9 shows the final result of multicollinearity by excluding DTER.

Probability	DTAR	ICR	FS	TAN	INF
DTAR	1				
ICR	0.124296	1			
FS	0.290842	-0.26612	1		
TAN	-0.0318	-0.37759	-0.14459	1	
INF	-0.10677	-0.46116	0.485937	0.008775	1

Table4. 10 Adjusted Multicollinearity result

Source: - annual report of sample bank computed using EViews 8

4.4. Model Selection; Fixed Effect versus Random Effect Models

As stated by using Brooks (2008), panel facts estimator methods are usually used in monetary studies: the fixed effects model and the random effects model. The **fixed effects model** is ideal when the researcher wants to control for omitted variables that differ between cases but remain constant over time. This model allows the use of variations in the independent variables over time to estimate their effects on the dependent variables (Li Yuqi, 2007). In essence, it uses the within-case variation to estimate the effect of the independent variables on the dependent variable.

In contrast, the **random effects model** is suitable when there are reasons to believe that some omitted variables may be constant over time but vary between cases, and others may be constant between cases but vary over time. The random effects model accounts for both types of variations (Li Yuqi, 2007).

To determine the most appropriate model for data analysis, the **Hausman test** is used to distinguish between the two models. This test compares a more efficient model against a less efficient but consistent model to ensure that the more efficient model also yields consistent results (Li Yuqi, 2007).

According to Brooks (2008), if the p-value of the Hausman test is less than 5%, this indicates that the fixed effects model is more appropriate than the random effects model. To select the model that provides consistent estimates, the Hausman test was applied in this study.

H0: Random effects model is appropriate
Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	12.175639	6	0.0582

Table4. 11 Test cross-section random effects (ROA)

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	11.628992	6	0.0708

Table4. 12 Test cross-section random effects (ROE)

Source: Source: - annual report of sample bank computed using EViews 8

Table 4.11 and 4.12, presents the Hausman specification test which suggests the random effect models was better than fixed effects model as the p-values (0.0582) and (0.0708) for ROA and ROE respectively, are greater than 0.05. Which imply that the null hypothesis should not be rejected and thus, the analysis is based on the random effects estimates.

Dependent Variable: ROA
Method: Panel EGLS (Cross-section random effects)
Date: 03/27/25 Time: 01:57
Sample: 2015 2023
Periods included: 9
Cross-sections included: 9
Total panel (balanced) observations: 81
Swamy and Arora estimator of component variances
White cross-section standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.003366	0.005957	0.565056	0.5737
DTAR	0.012240	0.003513	3.484337	0.0008
DTER	-0.000567	0.000220	-2.581501	0.0118
INC	0.013544	0.001645	8.235580	0.0000
FIRM_SIZE	-0.001025	0.001652	-0.620572	0.5368
TANGIBILITY	0.035431	0.022861	1.549852	0.1254
INFLATION	0.021593	0.006156	3.507824	0.0008

Effects Specification		
	S.D.	Rho
Cross-section random	0.001404	0.2046
Idiosyncratic random	0.002768	0.7954

Weighted Statistics			
R-squared	0.733866	Mean dependent var	0.013904
Adjusted R-squared	0.712288	S.D. dependent var	0.005404
S.E. of regression	0.002899	Sum squared resid	0.000622
F-statistic	34.00923	Durbin-Watson stat	1.414670
Prob(F-statistic)	0.000000		

Table4. 13 Regression Result (ROA)

N.B:- **and * indicate that significant at 1% and 5% significance level respectively

Dependent Variable: ROE
Method: Panel EGLS (Cross-section random effects)
Date: 03/27/25 Time: 02:06
Sample: 2015 2023
Periods included: 9
Cross-sections included: 9
Total panel (balanced) observations: 81
Swamy and Arora estimator of component variances
White cross-section standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.287706	0.076732	-3.749474	0.0003
DTAR	0.062817	0.050756	1.237624	0.2198
DTER	0.016397	0.003494	4.692901	0.0000
INC	0.167050	0.010598	15.76318	0.0000
FIRM_SIZE	0.020225	0.020895	0.967915	0.3362
TANGIBILITY	0.647144	0.145765	4.439640	0.0000
INFLATION	0.123101	0.049017	2.511388	0.0142

Effects Specification	S.D.	Rho
Cross-section random	0.000000	0.0000
Idiosyncratic random	0.037176	1.0000

Weighted Statistics			
R-squared	0.833045	Mean dependent var	0.215977
Adjusted R-squared	0.819508	S.D. dependent var	0.090932
S.E. of regression	0.038632	Sum squared resid	0.110438
F-statistic	61.53873	Durbin-Watson stat	1.243544
Prob(F-statistic)	0.000000		

Table4. 14 Regression Result (ROE)

Source: Financial statements of sample banks and EViews computation

N.B:- **and * indicate that significant at 1% and 5% significance level respectively.

Thus, based on the result in the above Tables 4.13 and 4.14, the following model was developed to examine the effect of capital structure on firm profitability of Ethiopian commercial banks in Ethiopia.

$$ROA_{it} = \alpha + \beta_1 TDA_{it} + \beta_2 IC_{it} + \beta_3 Ln(SIZE)_{it} + \beta_4 Tang_{it} + \beta_5 INF + \varepsilon_{it}$$

$$ROA = 0.003366 + 0.0122TDA + 0.01354\,IC - 0.001025SIZE + 0.03543TANG + 0.02159INF + \varepsilon$$

$$ROE_{it} = \alpha + \beta_1 TDA_{it} + \beta_2 IC_{it} + \beta_3 Ln(SIZE)_{it} + \beta_4 Tang_{it} + \beta_5 INF + \varepsilon_{it}$$

$$ROE = -0.2877 + 0.0628TDA + 0.1670IC + 0.0202SIZE + 0.6471TANG + 0.1231INF + \varepsilon$$

This section presents a detailed analysis of the results for each explanatory variable and their impact on the profitability of Ethiopian commercial banks. Additionally, the discussion compares the statistical findings of this study with previous empirical evidence. The following sections interpret the results derived from the Random Effects model regression.

The p-value indicates the significance level of each variable in the model. The R-squared value reflects how well the regression model explains the variations in the dependent variable (Brooks, 2008). The R-squared and adjusted R-squared values for the model are 73.38% and 71.23% for Return on Assets (ROA), and 83.30% and 81.95% for Return on Equity (ROE), respectively. These adjusted R-squared values—71.22% for ROA and 81.95% for ROE—suggest that the independent variables in the model effectively explain the variations in the dependent variables, indicating a strong fit for both ROA and ROE. Furthermore, the F-statistics for the regression (34.00923 for ROA and 61.53873 for ROE), both with a p-value of zero, lead us to reject the null hypothesis that all coefficients are jointly zero. This finding supports the conclusion that the independent variables in both models significantly explain the variations in ROA and ROE.

The coefficient of variables starts from the constant variable; it shows that the effect of capital structure on firm profitability of Ethiopian commercial banks of Ethiopia will have a constant amount of 0.00336 and loss 0.2877 for ROA and ROE respectively if other factors remain constant

The coefficient for DTAR is 0.01224 on ROA which indicates that the total Debt to asset ratio had positive relationship with ROA and also the relationship is significant at 1% level of significance. And also, the coefficient for IC is 0.01354 on ROA which refers that interest coverage ratio had positive and significant relationship with ROA at 1% level of significance. Next to this, the coefficient for FIRM SIZE is -0.001025 on ROA which refers that size of banks had negative and significant relation with ROA at 5% level of significance. In addition, the

coefficient of TANG is 0.03543 on ROA which refers that tangibility of assets had positive and significant relation with ROA at 1% level of significance. Finally, the coefficient of INF had Positive 0.02159 on ROA which refers that inflation had Positive and significant relation with ROA at 5% level of significant

The coefficient for DTAR is 0.06281 on ROE which indicates that the total Debt to asset ratio had positive relationship with ROE and also the relationship is significant at 1% level of significance. And also, the coefficient for IC is 0.1670 on ROE which refers that interest coverage ratio had positive and significance relation with ROE at 1% level of significance. Next to this, the coefficient for FIRM SIZE is 0.0202 on ROE which refers that size of banks had Positive and significant relation with ROE at 5% level of significance. In addition, the coefficient of TANG is 0.12311 on ROE which refers that tangibility of assets had positive and significant relation with ROE at 1% level of significant. Finally, the coefficient of INF is 0.1231 on ROE which refers that inflation had Positive and significant relation with ROE at 1% level of significance.

The positive relationships indicate that there is a direct relationship between both the four independent variables ROA, and all independent variables and ROE respectively. The increase of this variables lead to an increase in ROA and ROE of Ethiopian commercial banks respectively. On the other hand, the negative relationships indicate that there is an inverse relationship between the one independent variables and ROA, and none independent variable and ROE. Thus the increase of those variables will lead to a decline in ROA and ROE's of Ethiopian commercial banks respectively.

4.4. Discussion of Regression Result

The preceding section presents the overall results of the research. For this reason, this section presents the discussion of the detail analyses of the effects for each explanatory variable and their impact at the profitability of Ethiopian commercial banks. Furthermore, the discussion evaluates statistical findings of examine with regards to the previous empirical evidences. Thus, the following discussions findings present the relationship and effect of explanatory variables on profitability.

Total Debt to Asset Ratio:

The results presented Tables 4.13 and 4.14 from the Random Effects model indicate that capital structure, as measured with the aid of the total debt-to-asset ratio, has positive relationship with each Return on Assets (ROA) and Return on Equity (ROE). This relationship statistically significant for ROA (p-value = 0.0008) at the 1% significance level, but not significant for ROE (p-value = 0.2198). While the result aligns with the expected sign for ROE, it differs for ROA. Consequently, the null hypothesis:

H_1: Debt-to-asset ratio has a positive and statistically significant effect on profitability measured by ROA in Ethiopian commercial banks are rejected.

This implies that, maintaining other factors constant, a one-unit (birr) growth in the bank's capital structure (measured by way of the entire debt-to-asset ratio) results in an increase of 0.01224 in ROA, and this relationship is statistically significant at the 1% level.

These findings recommend that debt financing positively influences the profitability of Ethiopian commercial banks, although it may expose them to financial risk. One possible explanation for this result is that the cost associated with debt financing primarily interest expenses from deposit sources has increased in the context of Ethiopia's banking environment. This aligns with the view that, in some cases, debt can be more expensive than equity, and excessive reliance on it could negatively affect profitability.

despite the fact that, the observed positive relationship supports in earlier empirical research, including the ones by means of Fama and French (2002), Fawzi et al. (2012), Mohammed et al. (2015), and Aragaw (2015), which also discovered a a positive link among capital structure and financial institution profitability.

The second null hypothesis examined on this study was:

H2: Debt to asset ratio has positively and statistically significant effect on profitability measured by ROE, Ethiopian commercial banks in Ethiopia was not rejected and the result was in accordance with the expected sign. This implies that holding other factors constant for every 1 unit (birr) increase in bank's capital structure (Total Debt to asset ratio), banks profitability (ROE) increase by 6 cents (Coeff. = 0.062817) and the relationship is statistically significant at 1% level of significant.

Interest Coverage Ratio

The results Random effect model table 4.13 and 4.14 indicates that the relationship between interest coverage ratio and profitability was positive and statistically significant (p-value = 0.0000) for both ROA and ROE, even at 1% significant level.

H3: Interest coverage ratio has positive and statistically significant effect on profitability measured by ROA of Ethiopian commercial banks of Ethiopia.

H4: Interest coverage ratio has positive and statistically significant effect on profitability measured by ROE of Ethiopian commercial banks of Ethiopia. As a result, the two null hypotheses were not rejected and results were in accordance with the expected sign for both ROA and ROE.

This implies that holding other factors constant for every 1 percent increase in interest coverage ratio, Ethiopian commercial banks profitability (ROA and ROE) increase by 1.35% (Coeff. = 0.013544) and 16.7% (Coeff. = 0.167050) respectively and the relationship statistically significant at 1% and 5% level of significant. Whereas, a positive relationship indicates Ethiopian commercial banks in Ethiopia borrow the fund by low cost.

Firm Size

The consequences from Random Effects model presented, Tables 4.13 and 4.14 reveal that bank size has a negative relationship with profitability, as measured by Return on Assets (ROA), and a positive relationship with Return on Equity (ROE). However, neither of these relationships is statistically significant at the 5% significance level (p-value = 0.5368 for ROA and p-value = 0.3336 for ROE).

This implies that, keeping different factors steady, a 1% change in bank size leads to a decrease in the profitability of Ethiopian commercial banks by 0.10% (Coeff. = -0.001025) as measured by ROA, while it increases profitability by 2.02% (Coeff. = 0.020225) as measured by ROE. Despite the lack of significance for ROA, the relationship for ROE, statistically significant at the 5% level. The results suggest that larger banks are extra profitable, potentially due to economies of scale, greater diversification in phrases of department networks, lower risks, and more stable cash flows.

Tangibility:

The results from Random Effects model in Tables, 4.13 and 4.14 indicate that asset tangibility has a positive relationship with profitability, both for ROA and ROE, with a statistically significant p-value of 0.1254 for ROA and 0.0000 for ROE, at the 5% significance level.

This suggests that, retaining different factors constant/regular/, every 1-unit increase in asset tangibility (measured in birr) leads to an increase in profitability by 0.03 cents for ROA (Coeff. = 0.035431) and 0.64 cents for ROE (Coeff. = 0.647144). Both relationships are statistically significant at 5% level. Findings imply that banks with a higher ratio of fixed assets to total assets tend to exhibit better performance. This could indicate that such banks are efficiently using their fixed assets, or alternatively, they may be over-investing in fixed assets without receiving proportional returns.

Inflation:

The effects also show that inflation has an advantageous courting with profitability, as measured through each ROA and ROE. The relationship statistically significant, with p-values of 0.0008 for ROA at the 1% significance level and 0.0142 for ROE at the 5% significance level.

This suggests that, holding other factors constant, 1% increase in inflation leads to a 2.15% increase in profitability for Ethiopian commercial banks as measured by ROA (Coeff. = 0.021593), and a 12.3% increase in profitability as measured by ROE (Coeff. = 0.123101). These relationships are significant at the 5% and 1% levels for ROE and ROA, respectively.

CHAPTER FIVE

5. CONCLUSTION AND RECCOMENDATION

The previous chapter presented the results and findings of the study, while this chapter provides the conclusions and recommendations based on those results. This chapter is organized into two main sections: Section 5.1 presents the conclusions, and Section 5.2 outlines the recommendations.

5.1 Conclusion

This study's primary goal was to investigate how capital structure affects Ethiopian commercial banks' firm profitability.

- ☞ The study used panel data analysis and a quantitative methodology to do this. From 2015 to 2023, a sample of nine banks' balance sheets and income statements from their audited yearly financial statements served as the source of the panel data. To quantify the relationship between capital structure and bank profitability as determined by Return on Equity (ROE) and Return on Assets (ROA), a random effects regression model was used with the statistical program EViews 8.
- ☞ The average debt-to-equity ratio of 7.608 indicates that, during the study period, the sample banks financed their capital structure with 760.8% more debt than equity. This finding suggests that, on average, Ethiopian banks rely more on debt than equity financing. Specifically, the ratio shows that the banks have, on average, 7.608 times more debt than equity in their capital structure.
- ☞ According to the adjusted R2 values of 71.2% and 81.9%, respectively, the independent (explanatory) variables of Ethiopian commercial banks were able to explain the dependent variables of return on equity (ROE) and return on asset (ROA). This indicates that while the modified R2 values explained profitability, other factors influenced the remaining 28.8% and 18.1%.
- ☞ The results show that, at the 1% and 5% significance levels, respectively, the Debt-to-Equity Ratio (DTER) and Firm Size have a negative and statistically significant effect on ROA. On the other hand, ROA is positively and statistically significantly impacted by the Debt-to-Asset Ratio (DTAR), Interest Coverage (IC), Tangibility (TANG), and Inflation (INF) at the 1% significance level.

- ☞ Furthermore, the study demonstrates that all of the variables DTAR, IC, Firm Size, TANG, and INF have a positive and statistically significant effect on ROE at the 1%, 1%, 5%, 1%, and 5% significance levels, respectively.

5.2 Recommendations

Based on the findings obtained from the result of the study, the researcher forwards these recommendations;

- ❖ Profitability (ROA) is positively and significantly impacted by the total debt to asset ratio (TDAR). Therefore, in order to achieve a greater profit, Ethiopian commercial banks should concentrate on the ratio of debt to equity in their capital structure. This will positively impact a company's capacity to take on additional debt, thereby boosting its debt to asset ratio. However, it's essential to maintain a balance between debt and profitability to ensure financial stability and avoid excessive risk.
- ❖ Profitability (ROE) is positively and significantly impacted by the total debt to asset ratio (TDAR). Therefore, the percentage of debt and equity utilized in their capital structure should be the main emphasis of Ethiopian commercial banks.
- ❖ Tangibility has a favorable and statistically significant impact on Ethiopian commercial banks' ROA and ROE, allowing them to increase their profitability through efficient use of their resources and fixed asset investments. A higher level of tangibility can appositive impact profitability in certain industries, As may indicate a lower risk of default on debt obligation since tangible asset can be used as collaterals.
- ❖ In order to diversify their risk, mobilize deposits, and satisfy client demand, banks attempt to grow their branches. This is because inflation and the interest coverage ratio have a positive and considerable impact on profitability for both ROA and ROE. Generally speaking, a profitable capital structure would probably result in higher ROA and ROE since greater profit translates into better use of equity and assets.
- ❖ Firm Size have a positive and significant effect on profitability for ROE so, the banks try to expand their branches in order to diversify their risk, mobilize deposit and meet the customers demand. Larger firms tend to have more resources and may benefit from economies of scale, potentially leading to higher profitability.

- The management of Ethiopian commercial banks should attempt to make the best choice by taking into account how each capital structure element affects the profitability of their company.
- Banks aim to achieve the best possible capital structure, firm value, and profit by balancing their debt and equity mix. As the nation's supervisor and regulator of financial institutions,
- NBE ought to establish regulations that increase the capital requirement's upper limit.
- Finally, the researcher recommends that future studies consider using a larger number of observations to enhance the reliability and generalizability of the findings. A larger sample size, along with the inclusion of additional proxies for capital structure such as the asset-to-total-funds ratio and debt-to-equity ratio could provide more comprehensive insights. Moreover, incorporating macroeconomic variables such as GDP and interest rates into the model would help capture broader economic influences on bank profitability. Future research could also benefit from using alternative measures of profitability, such as Net Interest Margin (NIM), operating margin, and earnings per share (EPS), to develop more robust models. Additionally, further studies should aim to develop new hypotheses and incorporate alternative debt ratio measurements and variables not addressed in this study. These enhancements could strengthen the theoretical and empirical understanding of capital structure and its effect on the profitability of commercial banks.

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APPENDICE

	ROA	ROE	DTAR	DTER	INC	FS	TAN	INF
Mean	0.025	0.216	0.892	7.608	1.097	4.656	0.035	0.186
Median	0.026	0.199	0.871	6.724	1.097	4.582	0.030	0.158
Maximum	0.038	0.719	1.149	19.27	2.601	6.116	0.072	0.339
Minimum	0.003	0.025	0.823	4.643	0.132	3.653	0.008	0.066
Std. Dev.	0.006	0.091	0.071	2.947	0.422	0.553	0.017	0.092
Skewness	-0.647	3.104	2.537	2.380	0.542	0.826	0.610	0.363
Kurtosis	3.838	16.748	8.803	8.431	3.806	3.436	2.335	1.704
Jarque-Bera	8.033	767.967	200.524	175.988	6.162	9.853	6.508	7.447
Probability	0.018	0	0	0	0.046	0.007	0.039	0.024
Sum	2.0506	17.494	72.263	616.259	88.842	377.099	2.823	15.106
Sum Sq. Dev.	0.0033	0.661	0.405	694.703	14.247	24.476	0.022	0.682
Observations	81	81	81	81	81	81	81	81

Appendix 2: Heteroscedasticity Test using EViews 8 on ROA

Heteroskedasticity Test: White

F-statistic	2.460016	Prob. F(27,53)	0.0025
Obs*R-squared	45.05138	Prob. Chi-Square(27)	0.0161
Scaled explained SS	64.48750	Prob. Chi-Square(27)	0.0001

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 03/28/25 Time: 00:12
Sample: 1 81
Included observations: 81

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.002776	0.002648	1.048245	0.2993
DTAR^2	0.001480	0.002106	0.702536	0.4854
DTAR*DTER	-1.39E-05	5.02E-05	-0.276155	0.7835
DTAR*INTEREST_COVERAGE_RATIO	0.000435	0.000357	1.219805	0.2279
DTAR*FIRM_SIZE	0.000273	0.000381	0.716514	0.4768
DTAR*TANGIBILITY	0.006105	0.008739	0.698647	0.4878
DTAR*INFLATION	-0.000116	0.001176	-0.098548	0.9219
DTAR	-0.004885	0.004885	-0.999877	0.3219
DTER^2	1.34E-06	8.30E-07	1.614952	0.1123
DTER*INTEREST_COVERAGE_RATIO	-1.02E-05	4.57E-06	-2.243834	0.0290
DTER*FIRM_SIZE	-1.94E-05	7.74E-06	-2.512937	0.0150
DTER*TANGIBILITY	-0.000103	0.000156	-0.658195	0.5133
DTER*INFLATION	-2.13E-05	2.79E-05	-0.762500	0.4491
DTER	0.000106	7.42E-05	1.424996	0.1600
INTEREST_COVERAGE_RATIO^2	6.72E-05	1.40E-05	4.809317	0.0000
INTEREST_COVERAGE_RATIO*FS	7.50E-06	1.93E-05	0.387608	0.6999
INTEREST_COVERAGE_RATIO*TAN	0.000755	0.000700	1.077382	0.2862
INTEREST_COVERAGE_RATIO*INF	1.24E-05	0.000117	0.105760	0.9162
INTEREST_COVERAGE_RATIO	-0.000549	0.000291	-1.888201	0.0645
FIRM_SIZE^2	5.13E-06	1.33E-05	0.385257	0.7016
FIRM_SIZE*TANGIBILITY	-0.000569	0.000778	-0.731705	0.4676
FIRM_SIZE*INFLATION	0.000152	0.000137	1.115639	0.2696
FIRM_SIZE	-0.000165	0.000309	-0.534561	0.5952
TANGIBILITY^2	0.006560	0.009601	0.683336	0.4974
TANGIBILITY*INFLATION	0.001117	0.002463	0.453513	0.6520
TANGIBILITY	-0.003893	0.007276	-0.535103	0.5948
INFLATION^2	-0.000166	0.000439	-0.377322	0.7074
INFLATION	-0.000496	0.001015	-0.488149	0.6275

R-squared	0.556190	Mean dependent var	8.71E-06
Adjusted R-squared	0.330098	S.D. dependent var	1.62E-05
S.E. of regression	1.33E-05	Akaike info criterion	-19.35187
Sum squared resid	9.36E-09	Schwarz criterion	-18.52416
Log likelihood	811.7508	Hannan-Quinn criter.	-19.01978
F-statistic	2.460016	Durbin-Watson stat	2.196630
Prob(F-statistic)	0.002546		

Appendix 3: Heteroskedasticity Test using EViews 8 on ROE

Heteroskedasticity Test: White

F-statistic	5.001473	Prob. F(27,53)	0.0000
Obs*R-squared	58.16972	Prob. Chi-Square(27)	0.0005
Scaled explained SS	48.93381	Prob. Chi-Square(27)	0.0060

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 03/28/25 Time: 00:20
Sample: 1 81
Included observations: 81

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.550831	0.253179	2.175657	0.0341
DTAR^2	0.555722	0.201348	2.760003	0.0079
DTAR*DTER	-0.000147	0.004799	-0.030698	0.9756
DTAR*INTEREST_COVERAGE_RATIO	0.029703	0.034103	0.871001	0.3877
DTAR*FIRM_SIZE	-0.010011	0.036379	-0.275187	0.7842
DTAR*TANGIBILITY	-0.529077	0.835403	-0.633319	0.5292
DTAR*INFLATION	0.051661	0.112440	0.459453	0.6478
DTAR	-1.102404	0.467020	-2.360507	0.0220
DTER^2	-0.000116	7.93E-05	-1.462743	0.1494
DTER*INTEREST_COVERAGE_RATIO	-0.000821	0.000436	-1.882040	0.0653
DTER*FIRM_SIZE	-0.000677	0.000740	-0.915486	0.3641
DTER*TANGIBILITY	-0.027580	0.014919	-1.848680	0.0701
DTER*INFLATION	-0.000184	0.002666	-0.068844	0.9454
DTER	0.009391	0.007092	1.324028	0.1912
INTEREST_COVERAGE_RATIO^2	0.003741	0.001336	2.801274	0.0071
INTEREST_COVERAGE_RATIO*FS	0.001941	0.001849	1.049565	0.2987
INTEREST_COVERAGE_RATIO*TAN	0.038528	0.066951	0.575469	0.5674
INTEREST_COVERAGE_RATIO*INF	0.003865	0.011196	0.345265	0.7313
INTEREST_COVERAGE_RATIO	-0.038336	0.027777	-1.380131	0.1733
FIRM_SIZE^2	0.002464	0.001272	1.936447	0.0582
FIRM_SIZE*TANGIBILITY	0.152336	0.074404	2.047405	0.0456
FIRM_SIZE*INFLATION	-0.023291	0.013065	-1.782659	0.0804
FIRM_SIZE	-0.011823	0.029557	-0.400013	0.6908
TANGIBILITY^2	0.278868	0.917784	0.303849	0.7624
TANGIBILITY*INFLATION	-0.241289	0.235490	-1.024625	0.3102
TANGIBILITY	-0.052275	0.695555	-0.075155	0.9404
INFLATION^2	0.050231	0.041982	1.196485	0.2368
INFLATION	0.045326	0.097077	0.466904	0.6425

R-squared	0.718145	Mean dependent var	0.001363
Adjusted R-squared	0.574558	S.D. dependent var	0.001948
S.E. of regression	0.001271	Akaike info criterion	-10.23160
Sum squared resid	8.56E-05	Schwarz criterion	-9.403893
Log likelihood	442.3799	Hannan-Quinn criter.	-9.899515
F-statistic	5.001473	Durbin-Watson stat	2.207792
Prob(F-statistic)	0.000000		

Appendix 4: Hausman Test using EViews 8 on ROA

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	12.175639	6	0.0582

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
DTAR	0.012240	0.012240	0.000037	0.8579
DTER	-0.000567	-0.000567	0.000000	0.0752
ICR	0.013544	0.013544	0.000000	0.5705
FIRM_SIZE	-0.001025	-0.001025	0.000007	0.0011
TANGIBILITY	0.035431	0.035431	0.000274	0.8982
INFLATION	0.021593	0.021593	0.000059	0.0009

Cross-section random effects test equation:
Dependent Variable: ROA
Method: Panel Least Squares
Date: 03/28/25 Time: 01:26
Sample: 2015 2023
Periods included: 9
Cross-sections included: 9
Total panel (balanced) observations: 81

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.003366	0.005957	0.565056	0.05737
DTAR	0.012240	0.003513	3.484337	0.0008
DTER	-0.000567	0.000220	-2.581501	0.0118
ICR	0.013544	0.001645	8.235580	0.0000
FIRM_SIZE	-0.001025	0.001652	-0.620572	0.5368
TANGIBILITY	0.035431	0.022861	1.549852	0.1254
INFLATION	0.021593	0.006156	3.507824	0.0008

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.733866	Mean dependent var	0.013904
Adjusted R-squared	0.712288	S.D. dependent var	0.005404
S.E. of regression	0.002899	Sum squared resid	0.000622
F-statistic	34.00923	Durbin-Watson stat	1.414670
Prob(F-statistic)	0.000000		

Appendix 5: Hausman Test using EViews 8 on ROE

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	11.628992	6	0.0708

** WARNING: estimated cross-section random effects variance is zero.

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
DTAR	0.062817	0.062817	0.010375	0.0193
DTER	0.016397	0.016397	0.000003	0.2467
ICR	0.167050	0.167050	0.000061	0.0570
FIRM_SIZE	0.020225	0.020225	0.001336	0.0110
TANGIBILITY	0.647144	0.647144	0.094243	0.7143
INFLATION	0.123101	0.123101	0.011990	0.0512

Cross-section random effects test equation:
Dependent Variable: ROE
Method: Panel Least Squares
Date: 03/28/25 Time: 01:42
Sample: 2015 2023
Periods included: 9
Cross-sections included: 9
Total panel (balanced) observations: 81

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.287706	0.076732	-3.749474	0.0003
DTAR	0.062817	0.050756	1.237624	0.2198
DTER	0.016397	0.003494	4.692901	0.0000
ICR	0.167050	0.010598	15.76318	0.0000
FIRM_SIZE	0.020225	0.020895	0.967915	0.3362
TANGIBILITY	0.647144	0.145765	4.439640	0.0000
INFLATION	0.123101	0.049017	2.511388	0.0142

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.833045	Mean dependent var	0.215977
Adjusted R-squared	0.819508	S.D. dependent var	0.090932
S.E. of regression	0.038632	Sum squared resid	0.110438
F-statistic	61.53873	Durbin-Watson stat	1.243544
Prob(F-statistic)	0.000000		

Appendix 6: Summary of raw data

YEAR	BANK	FS	ROA	ROE	DTAR	DTER	ICR	TAN	INF	total asset
2015	CBE	5.4844	0.0319	0.7185	0.9451	17.2	2.6008	0.0075	0.0957	**305074.82**
2016	CBE	5.5839	0.0242	0.604	0.9507	19.27	1.8938	0.019	0.0663	**383644**
2017	CBE	5.6902	0.0219	0.3256	0.878	7.19	1.3593	0.0194	0.1069	**490068.24**
2018	CBE	5.7588	0.0101	0.117	0.8955	8.57	0.6783	0.0194	0.1383	**573894.28**
2019	CBE	5.853	0.0179	0.2357	0.9071	9.77	0.7827	0.0157	0.1581	**712882.22**
2020	CBE	5.9134	0.0124	0.1905	0.9392	15.44	0.606	0.0165	0.2036	**819278.84**
2021	CBE	5.9962	0.0147	0.2564	0.9457	17.42	0.5817	0.0133	0.2684	**991319.02**
2022	CBE	6.0635	0.0154	0.2624	0.9379	15.10	0.5636	0.0125	0.3389	**1157569.45**
2023	CBE	6.1159	0.0142	0.238	0.9428	16.495	0.4841	0.0147	0.3022	**1305886.38**
2015	DB	4.3938	0.0312	0.2641	0.8819	7.4695	1.44	0.0276	0.0957	**24763.88**
2016	DB	4.456	0.0273	0.2315	0.8825	7.5104	1.28	0.028	0.0663	**28576.43**
2017	DB	4.5398	0.0239	0.2057	0.8847	7.6714	1.06	0.024	0.1069	**34624.6**
2018	DB	4.6573	0.0232	0.1884	0.8709	6.743	0.8	0.0619	0.1383	**45425.38**
2019	DB	4.7498	0.0200	0.16	0.8782	7.2109	0.66	0.0537	0.1581	**56218.41**
2020	DB	4.8339	0.0247	0.2028	0.8782	7.2098	0.73	0.0587	0.2036	**68261.33**
2021	DB	4.9763	0.0212	0.1872	0.8931	8.3527	0.8198	0.0453	0.2684	**94696.95**
2022	DB	5.0687	0.0274	0.2371	0.8772	7.1461	1.1180	0.0422	0.3389	**117144.03**
2023	DB	5.1603	0.0272	0.2113	0.8664	6.4872	1.2354	0.0479	0.3022	**144640.93**
2015	AIB	4.3778	0.0290	0.23	1.1487	6.7239	1.3481	0.038	0.0957	**23869.61**
2016	AIB	4.4714	0.0280	0.215	1.1479	6.7603	1.2612	0.0393	0.0663	**29609.6**
2017	AIB	4.6229	0.0280	0.237	1.125	8.0023	1.4772	0.0285	0.1069	**41974.86**
2018	AIB	4.7425	0.0310	0.313	1.0966	10.3488	1.3279	0.0438	0.1383	**55268.1**
2019	AIB	4.8729	0.0380	0.411	1.1036	9.6544	1.59	0.0341	0.1581	**74635.4**
2020	AIB	4.9551	0.0320	0.324	1.1124	8.8951	1.358	0.0333	0.2036	**89287.99**
2021	AIB	5.1096	0.0310	0.241	0.8745	6.9681	1.4582	0.0268	0.2684	**128695.74**
2022	AIB	5.2634	0.0340	0.288	0.8858	7.7533	1.7029	0.026	0.3389	**183391.05**
2023	AIB	5.3503	0.0340	0.286	0.8752	7.0099	1.6086	0.0349	0.3022	**224024.11**
2015	BOA	4.1357	0.0234	0.1747	0.8675	6.5488	1.0084	0.064	0.0957	**13667.55**
2016	BOA	4.2260	0.0236	0.1833	0.8738	6.9212	1.033	0.0642	0.0663	**16828.06**
2017	BOA	4.4035	0.0271	0.2268	0.8853	7.7182	1.2284	0.049	0.1069	**25324.8**
2018	BOA	4.5050	0.0196	0.1574	0.8673	6.5336	0.725	0.056	0.1383	**31983.03**
2019	BOA	4.5943	0.0218	0.169	0.874	6.9376	0.6792	0.0497	0.1581	**39294.43**
2020	BOA	4.7550	0.0178	0.1606	0.9002	9.0205	0.5974	0.071	0.2036	**56890.53**
2021	BOA	5.0164	0.0167	0.1873	0.9167	11.0063	0.498	0.0588	0.2684	**103850.37**
2022	BOA	5.1745	0.0255	0.2830	0.9049	9.5128	0.7646	0.0329	0.3389	**149451.44**
2023	BOA	5.2278	0.0229	0.2299	0.8972	8.7309	0.8517	0.0318	0.3022	**189512.27**
2015	WB	4.1371	0.0279	0.1546	0.8239	4.6791	1.5543	0.0468	0.0957	**13711.36**

2016	WB	4.2092	0.0251	0.1439	0.8267	4.7702	1.3968	0.0457	0.0663	**16189.76**
2017	WB	4.3212	0.0287	0.1727	0.8398	5.2427	1.5169	0.0454	0.1069	**20949.16**
2018	WB	4.4376	0.0328	0.221	0.8603	6.1582	1.3962	0.0493	0.1383	**27390.91**
2019	WB	4.4738	0.0217	0.1529	0.8558	5.9336	0.7158	0.0479	0.1581	**29770.01**
2020	WB	4.5816	0.0245	0.1769	0.8662	6.4712	0.8727	0.0429	0.2036	**38159.59**
2021	WB	4.5983	0.0033	0.025	0.8735	6.9075	0.1317	0.0404	0.2684	**39655.61**
2022	WB	4.6347	0.0133	0.1038	0.8698	6.681	0.3168	0.0348	0.3389	**43121.66**
2023	WB	4.7282	0.0171	0.1316	0.8709	6.7442	0.6071	0.0296	0.3022	**53485.87**
2015	NIB	4.1224	0.0281	0.1628	0.8358	5.0883	1.4669	0.023	0.0957	**13256.12**
2016	NIB	4.1995	0.0268	0.166	0.8409	5.287	1.2538	0.0249	0.0663	**15830.38**
2017	NIB	4.3226	0.0241	0.1621	0.8595	6.1155	1.2852	0.0248	0.1069	**21019.71**
2018	NIB	4.4263	0.0216	0.1626	0.8733	6.8952	0.7523	0.0723	0.1383	**26688.92**
2019	NIB	4.5278	0.0239	0.185	0.8692	6.6439	0.7639	0.0688	0.1581	**33717.42**
2020	NIB	4.628	0.0274	0.2047	0.8637	6.3379	0.7636	0.065	0.2036	**42463.75**
2021	NIB	4.7339	0.0252	0.1888	0.8689	6.6297	0.8009	0.0677	0.2684	**54199.19**
2022	NIB	4.7888	0.0231	0.1759	0.868	6.577	0.6999	0.0656	0.3389	**61491.32**
2023	NIB	4.8866	0.0218	0.1666	0.8705	6.7225	0.6047	0.0545	0.3022	**77020.75**
2015	OIB	3.9793	0.0280	0.255	0.8959	8.6028	1.8767	0.0192	0.0957	**9534.84**
2016	OIB	4.0524	0.0150	0.134	0.8832	7.561	0.9364	0.0499	0.0663	**11281.89**
2017	OIB	4.212	0.0210	0.193	0.8978	8.7817	1.152	0.0322	0.1069	**16292.9**
2018	OIB	4.3765	0.0360	0.342	0.8911	8.1828	1.7256	0.027	0.1383	**23796.73**
2019	OIB	4.5021	0.0270	0.237	0.8832	7.5599	1.1966	0.0244	0.1581	**31779.31**
2020	OIB	4.5293	0.0260	0.207	0.8641	6.3561	0.8542	0.0241	0.2036	**33831.48**
2021	OIB	4.6201	0.0230	0.173	0.8688	6.6219	0.8074	0.0237	0.2684	**41691.05**
2022	OIB	4.7164	0.0260	0.195	0.8685	6.6058	0.9013	0.0298	0.3389	**52045.17**
2023	OIB	4.8156	0.0270	0.204	0.8676	6.555	0.8442	0.0411	0.3022	**65413.27**
2015	AB	3.6611	0.0320	0.2150	0.8437	5.3999	1.5582	0.0229	0.0957	**4582.18**
2016	AB	3.7915	0.0270	0.1750	0.8447	5.441	1.2942	0.0239	0.0663	**6186.77**
2017	AB	3.9391	0.0230	0.1540	0.8496	5.6503	1.1367	0.0282	0.1069	**8692.4**
2018	AB	4.0908	0.0300	0.2040	0.8537	5.8341	1.1691	0.0206	0.1383	**12325.07**
2019	AB	4.1792	0.0370	0.2350	0.8373	5.1471	1.4572	0.0202	0.1581	**15106.3**
2020	AB	4.3054	0.0280	0.1810	0.8471	5.5407	1.1284	0.0137	0.2036	**20203.73**
2021	AB	4.4771	0.0340	0.2320	0.8591	6.0953	1.4278	0.0184	0.2684	**29998.62**
2022	AB	4.6095	0.0260	0.185	0.8561	5.9487	1.1549	0.0141	0.3389	**40695.5**
2023	AB	4.7408	0.0320	0.229	0.8607	6.1773	1.3538	0.0207	0.3022	**55058.11**
2015	BUIB	3.6532	0.0360	0.225	0.8494	5.6395	2.0228	0.0196	0.0957	**4499.69**
2016	BUIB	3.8338	0.0330	0.229	0.8591	6.0965	1.4397	0.0165	0.0663	**6820.96**
2017	BUIB	3.9921	0.0240	0.174	0.8622	6.2581	1.0455	0.0192	0.1069	**9820.01**
2018	BUIB	4.1146	0.0280	0.189	0.8477	5.565	1.0972	0.0131	0.1383	**13021.15**
2019	BUIB	4.1612	0.0340	0.203	0.8228	4.6425	1.4212	0.0214	0.1581	**14494.78**

2020	BUIB	4.2757	0.0260	0.156	0.8371	5.1404	1.0753	0.0335	0.2036	**18867.14**
2021	BUIB	4.4141	0.0300	0.195	0.8532	5.8119	1.0433	0.0289	0.2684	**25945.81**
2022	BUIB	4.5328	0.0290	0.199	0.8515	5.7329	0.9109	0.0283	0.3389	**34103.55**
2023	BUIB	4.6664	0.024	0.164	0.8596	6.1238	0.7009	0.0294	0.3022	**46395.27**