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THE EFFET OF LIQUIDITY AND SOLVENCY ON PROFITABILITY IN CASE OF ETHIOPIA'S PRIVATE BANKS

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DECLARATION

I, Eyobed Miriye, hereby declare that the thesis titled "**The Impact of Liquidity and Solvency on Profitability in Ethiopian's Private Banks"** is my own original work. I have conducted this research self-sufficiently, under the supervision and assistance of my research advisor. This research has not been previously presented for any degree or credential program, whether at this institution or elsewhere. I have duly acknowledged all sources of materials used in this thesis.

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This is to affirm that the thesis authored by **Eyobed Miriye,** titled "**The Impact of Liquidity and solvency on profitability**" and accepted as a partial fulfillment of the prerequisites for the Master of Business Administration MBA degree with a specialization in Finance, aligns with the University's guidelines and adheres to recognized benchmarks in terms of originality and excellence.

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ABSTRACT

This study aims to address the challenges associated with evaluating profitability in the Ethiopian banking industry, the evaluation of profitability within the Ethiopian banking industry faces challenges associated with the reliance on high annual gross profit as a comparative benchmark. This research addresses this issue by investigating and contrasting the influence of liquidity and solvency on the profitability of Ethiopian private banks. The primary objective is to establish an industry benchmark through a thorough desk review, evaluating the annual reports of Ethiopian private banks using liquidity, profitability, and solvency ratios. Adopting a case study research methodology, the study selects 16 private banks registered under the National Bank of Ethiopia based on the accessibility of their accounting statements. The analysis focuses on return on assets (ROA) as the dependent variable and considers current ratio, debt ratio, interest coverage ratio, and total debt to equity ratio as independent variables. The study employs correlation coefficient analysis and ANOVA F-test within the framework of multiple regression analysis to reveal statistically and practically significant findings. Notably, the research identifies a positive correlation between the current ratio and ROA, emphasizing the importance of liquidity in driving profitability among the sampled banks. Conversely, the study highlights a negative relationship between the debt ratio, interest coverage ratio, and ROA, underscoring the adverse impact of high debt and low interest coverage on profitability within the Ethiopian private banking sector. In conclusion, these findings underscore the critical significance of considering liquidity and solvency factors in the evaluation of profitability within the Ethiopian banking industry, providing valuable insights for stakeholders and policymakers.

Keywords: Profitability, Ethiopian banking industry, Liquidity, Solvency, Return on Assets (ROA), Current Ratio, Debt Ratio, Interest Coverage Ratio, Multiple Regression Analysis.

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ABBREVIATIONS

- CA/TA- Current Asset to Total Asset Ratio
- CUB- Cubic
- CR- Current ratio
- EBIT- Earnings before interest and taxes
- D/E- Debt to Equity
- DR debt ratio
- LQD- Liquidity
- LIN- Linear
- LOG- Logarithmic
- NBE -National Bank of Ethiopia
- Int. Cov. interest coverage ratio
- QUA- Quadric
- ROA- Return on Assets
- ROI- Return on investment

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Despite its focus on short-term investment and financing, finance often receives less attention in financial decision-making. This is because it is viewed as a limitation on financial performance, as it does not directly contribute to return on assets or return on equity. However, it is worth noting that a carefully planned and executed financial management strategy is projected to yield a beneficial effect on a company's value (Isaboke & Kwasira, 2016).

In financial management, a significant dilemma lies in achieving the desired tradeoff between liquidity, solvency, and profitability (Pimpong & Laryea, 2016). Managing working capital in terms of liquidity, solvency, and profitability is crucial for ensuring sound financial performance, as it directly influences a company's profitability (Nikolovski & Travica, 2021). Maintaining adequate liquidity and solvency in day-to-day operations is crucial for the smooth functioning of working capital and meeting obligations (Panigrah & Gijare, 2018). The ultimate goal of profitability is achieved through the efficient use of resource. With a primary emphasis on enhancing shareholders' or owners' wealth (Rezaee, 2016), this attainment can be appraised through an analysis of financial performance, which provides an overview of a company's financial well-being during a defined timeframe. The evaluation of financial performance entails an examination of the operational and financial attributes of a company using accounting and financial statements. The aim of this analysis is to gauge the effectiveness and competence of a company's management, as manifested in its financial records and reports.

In prior studies, scholars have explored the interconnectedness among liquidity, solvency, and profitability. Emmert and Dehmer (2019) emphasize the value of regression analysis as a statistical tool that facilitates the establishment of relationships between independent and dependent variables, allowing for predictions based on these connections. Notably, researchers have delved into the impact of liquidity and solvency on profitability, underscoring its paramount significance (Panigrah & Gijare, 2018).

Despite the valuable contributions made by previous studies, a notable gap persists in the literature concerning the explicit discussions on practical significance of each predictor is an area that this thesis aims to address. The exploration of relationships among liquidity, solvency, and profitability takes on heightened importance, particularly within the context of the banking industry (Ross, Westerfield, & Jordan, 2015). This gap revolves around comprehending the intricate ways in which these factors interact and mutually influence one another within banking institutions, as highlighted by Pimpong and Laryea (2016). Recognizing the critical nature of these challenges, this research endeavors to delve into the nuanced relationship between liquidity, solvency, and profitability, focusing specifically on selected private banks in Ethiopia.

1.2 Statement of the problem

Effective management of liquidity and solvency, in conjunction with bank performance, are critical determinants that shape the progress, survival, sustainability, expansion, and overall operation of a banking system. However, effectively managing the trade-off between liquidity and solvency poses a challenge for banks and can lead to distress. Banks often face a mismatch of liquidity, where their liabilities (such as demand deposits) are more liquid than their assets (such as loans). This becomes problematic when a large number of depositors attempt to withdraw funds simultaneously, putting strain on the bank's liquidity position. Furthermore, some banks may have investments in secure yet less liquid assets that yield high returns, while also being committed to loans. Sudden withdrawals and a shortage of liquid resources can lead to substantial losses and the necessity for emergency loans, a key contributor to bank failures (Worku & Asmare, 2018). To tackle these challenges, banks are formulating a range of policies and strategies aimed at averting runs and enhancing their liquidity positions. However, these endeavors to boost returns can potentially hamper liquidity, resulting in reduced customer trust, deterioration of creditworthiness, and even the forced sale of assets. Conversely, maintaining excessive liquidity to meet customer demands can impact returns. Errors in liquidity and solvency planning and execution can disrupt bank operations and have enduring repercussions on the economy. Therefore, further research in these areas can help in identifying and addressing the mistakes in liquidity and solvency planning.

1.3 Objectives

1.3.1. General Objective

The main objective of this research to study the effect of liquidity and solvency on profitability of selected Ethiopia's private banks.

The Specific objective are:

I. To Evaluate the association between Debt ratios and ROA in banks, considering various factors, to determine if a statistically significant relationship exists.

II. To Examine the strength and direction of the potential positive correlation between Debt to Equity ratios and ROA in banks, while accounting for additional influential factors.

III. To Investigate the presence and significance of a positive relationship between interest coverage and ROA within the banking context, taking into account the influence of other relevant factors.

IV. To Analyze the nature and extent of any positive correlation between Current ratio and ROA in banks, considering the impact of various variables on this relationship.

Hence, the research should address the following questions:

i. Is there a statistically significant relationship between Debt ratios and ROA in banks, considering various factors?

ii. What is the strength and direction of the potential positive correlation between Debt to Equity ratios and ROA in banks, while accounting for additional influential factors?

iii. Does a positive relationship exist between interest coverage and ROA within the banking context, and is it significant, considering the influence of other relevant factors?

iv. What is the nature and extent of any positive correlation between Current ratio and ROA in banks, considering the impact of various variables on this relationship?

1.5 Significance of the Research

This study seeks to investigate the impact of managing liquidity and solvency on the performance of commercial banks in Ethiopia. By conducting a comprehensive analysis, including the examination linear regression equations, this study seeks to provide a more comprehensive understanding of the interrelationships among liquidity, solvency, and profitability in the Ethiopian banking sector. The findings of this research are expected to enhance the effectiveness of liquidity and solvency management strategies, thereby contributing to improved bank performance and economic stability in Ethiopia. Additionally, this research can serve as a valuable reference for scholars interested in further investigating this area.

1.6 Scope and limitation of the Study

The study encompassed 16 private banks in Ethiopia and focused on the period between 2014 and 2022 G.C. These specific banks were chosen because they had been established for at least two years by 2014 and had publicly posted their annual reports on their websites, that indicate stability and profitability of their banks. The research aimed to analyze the financial performance of these banks using four independent variables: Liquidity and Solvency ratio, including the Current Asset to Current Liability ratio and Debt to Equity ratio, as well as the Interest Coverage ratio. Additionally, the study examined the dependent variable of Profitability of Return on Asset.

1.7 Organization of the Structure

This study report is structured into five sections. Section one offers a comprehensive overview of the entire report. Section two presents an examination of relevant literature. Section three provides an in-depth explanation of the research methodology employed. Section four encompasses the presentation, analysis, and interpretation of data. Lastly, the concluding section summarizes the overall work of the research and offers pertinent recommendations derived from the findings.

CHAPTER TWO

REVIEW OF LITERATURE

2.1 Theoretical Literature review

This section is concerned with the introduction of a literature review, encompassing both theoretical and empirical aspects, as well as research hypotheses and research models.

2.1.1 Concept of liquidity

Liquidity refers to the ease with which an individual or an organization can convert their assets into cash quickly and without momentous losses. It is a crucial aspect of financial management as it ensures that an entity can fulfill its short-term financial obligations, such as forfeiting bills and wages, purchasing inventory, and meeting unexpected expenses (Akenga, 2017).

There are several indicators of liquidity, including, the quick ratio, the cash ratio, and the current ratio. The current ratio is calculated by dividing current assets by current liabilities and indicates a company's capability to pay its short-term obligations. The quick ratio is similar to the current ratio but excludes inventory from current assets, as inventory may not be without difficulty convertible into cash. The cash ratio measures a company's potential to pay its short-term obligations using only liquid asset called cash and cash equivalents (Lalithchandra, 2021).

Maintaining adequate liquidity is crucial for various reasons. Firstly, it guarantees that a company can meet its financial obligation and prevent debt defaulting. Secondly, it acts as a buffer against unforeseen expenses or economic downturns. Thirdly, it has the potential to improve a company's standing and creditworthiness, thereby facilitating the acquisition of funding or attracting investors. However, maintaining high levels of liquidity can also have drawbacks. Holding large amounts of cash or easily liquidated assets can lead to lower returns on investment, as the funds are not being used for income-generating activities. Additionally, maintaining high levels of liquidity may signal to investors that a company is not using its resources effectively or efficiently Njue (2020).

In summary, liquidity is an important aspect of financial management that refers to an entity's ability to convert its assets into cash quickly and easily. Maintaining adequate liquidity is crucial for meeting short-term financial obligations, providing a cushion against unexpected expenses, and enhancing reputation and creditworthiness. However, maintaining high levels of liquidity can also have drawbacks, such as lower returns on investment and signaling inefficiency to investors Njue (2020).

2.1.2 Concept of Solvency

Solvency pertains to a company's capacity to fulfill its long-term financial obligations, including the repayment of debts and other liabilities. It holds significant importance in financial management, as it signifies a company's ability to sustain its operations over an extended period (Akenga, 2017).

Solvency is usually assessed by comparing a company’s total assets to its total liabilities. This is commonly referred to as the debt-to-equity ratio, which measures the extent of a company’s debt in relation to its equity or shareholder funds. A company with a high debt-to-equity ratio may be perceived as less solvent, as it carries a greater amount of debt relative to its assets and equity (Lalithchandra, 2021).

Maintaining adequate solvency is crucial for several reasons. Firstly, it ensures that a company can meet its long-term financial obligations and avoid bankruptcy. Secondly, it enhances a company's creditworthiness and ability to secure financing or attract investors. Thirdly, it provides a cushion against economic downturns or unexpected expenses, as a company with high levels of debt may struggle to meet its obligations during difficult times Njue (2020).

However, maintaining high levels of solvency can also have drawbacks. Companies that prioritize solvency may be more conservative in their investments and may not take advantage of growth opportunities. Additionally, high levels of debt can lead to higher interest payments and lower profits, which can impact a company's ability to generate returns for its shareholders Njue (2020). In summary, solvency is an important aspect of financial management that refers to a company's ability to meet its long-term financial obligations. Maintaining adequate solvency is crucial for avoiding bankruptcy, enhancing creditworthiness, and providing a cushion against economic downturns. However, high levels of solvency can also have drawbacks, such as a conservative investment approach and lower profits (Lalithchandra, 2021).

2.1.3 Concept of profitability

Earning capacity is a gauge of a company's ability to generate profits over a specific timeframe. It holds significant importance in financial management, as it indicates a company's capability to generate favorable returns for its stakeholders Akenga (2017).

There are various indicators of earning capacity, including gross profit margin, net profit margin, return on assets, and return on equity. Gross profit margin is computed by deducting the cost of goods sold from revenue and dividing it by revenue, while net profit margin is calculated by dividing net income by revenue. Return on assets assesses a company's ability to generate returns from its assets, while return on equity measures its ability to generate returns for its shareholders Lalithchandra (2021).

Maintaining adequate profitability is important for several reasons. Firstly, it ensures that a company can generate positive returns for its investors and attract new investors. Secondly, it provides a cushion against unexpected expenses or downturns in the economy. Thirdly, it enables a company to reinvest profits into the business and pursue growth opportunities.

However, maintaining high levels of profitability can also have drawbacks. Companies that prioritize profitability may focus too heavily on short-term gains and neglect long-term growth opportunities. Additionally, high profitability can attract competition and lead to price wars or other challenges that can impact profits Njue (2020).

In summary, profitability is an important aspect of financial management that refers to a firm's ability to generate profits over a period of time. Maintaining adequate profitability is crucial for generating returns for investors, providing a cushion against unexpected expenses, and pursuing growth opportunities. However, high levels of profitability can also have drawbacks, such as a focus on short-term gains and increased competition.

2.1.4 Relation between Liquidity and Profitability

The relationship between liquidity and profitability is complex and often depends on the specific circumstances of a business. However, in general, there is an interrelation between liquidity and profitability, as maintaining high levels of liquidity can reduce profitability, while prioritizing profitability can impact liquidity Edem (2017).

On the one hand, maintaining high levels of liquidity, such as holding large amounts of cash or easily liquidated assets, can reduce profitability. This is because funds that are held in cash or other liquid assets are not being used for income-generating activities. Additionally, high levels of liquidity can signal to investors that a company is not using its resources effectively or efficiently, which can impact its reputation and creditworthiness.

Conversely, placing a strong emphasis on profitability can have implications for liquidity, as investments in income-generating endeavors may result in funds being tied up for prolonged durations. This can restrict a company's capacity to fulfill immediate financial commitments, such as settling bills and compensating employees, or to address unforeseen expenses.

Additionally, investments in growth and expansion may require additional financing, which can impact liquidity in the short term Fajaria and Isnalita (2018).

Therefore, businesses need to strike a balance between liquidity and profitability that is appropriate for their specific circumstances. This may involve maintaining adequate liquidity to meet short-term obligations and provide a cushion against unexpected expenses, while also pursuing growth and income-generating activities to enhance profitability. Additionally, businesses may need to consider factors such as the industry they operate in, their financial position, and their long-term goals when determining the appropriate balance between liquidity and profitability.

2.1.5 Relation between Solvency and Profitability

Solvency and profitability are two important financial metrics that measure a company's financial health. Solvency pertains to a company's capability to fulfill its long-term debt obligations, while profitability assesses a company's capacity to generate profits within a specified timeframe Edem (2017).

There is a close relationship between solvency and profitability. A profitable company stands a higher chance of being solvent, as it possesses sufficient cash inflows to settle debts and fulfill financial commitments. Profitability also holds significance for a company's long-term solvency, as it allows for investment in growth prospects and the enhancement of its financial standing.

On the other hand, a company that is not profitable is more likely to face solvency issues since it may not have enough cash inflows to meet its debt obligations. In such cases, the company may have to rely on external financing, which can further increase its debt burden and reduce its solvency Fajaria, and Isnalita, (2018).

Overall, a strong balance between solvency and profitability is crucial for a company's financial health and long-term sustainability. Companies that focus on improving both metrics are more likely to succeed in the long run.

2.2 Empirical Literature Review

The aim of this empirical literature review is to investigate the correlation between liquidity, solvency, and profitability. Liquidity and solvency are crucial financial metrics used to evaluate a company's financial well-being. Liquidity assesses a company's ability to meet short-term obligations, while solvency evaluates its capacity to fulfill long-term obligations. Profitability, on the other hand, gauges a company's ability to generate profits from its operations.

Several studies have explored the association between liquidity, solvency, and profitability. Some studies have discovered a positive correlation between liquidity and profitability, while others have found no statistically significant relationship. For instance, Al-Malkawi's (2015) study revealed a positive correlation between liquidity and profitability in the Jordanian banking sector. It found that banks with higher liquidity levels tend to exhibit greater profitability.

Similarly, Chowdhury and Rahman (2016) found a positive relationship between liquidity and profitability in the textile industry of Bangladesh. The study demonstrated that companies with higher liquidity levels tend to achieve greater profitability. Additionally, it revealed that companies with higher solvency levels also tend to have higher profitability.

However, other studies have found no significant relationship between liquidity and profitability. Bhatia's (2016) study, for example, found no significant correlation between liquidity and profitability in the Indian banking sector. It suggested that higher liquidity levels in banks do not necessarily result in higher profitability.

Similarly, Asante and Osei-Tutu (2018) found no significant relationship between liquidity and profitability in the Ghanaian banking sector. Their study indicated that banks with higher liquidity levels do not necessarily achieve higher profitability. Additionally, it revealed that companies with higher solvency levels tend to have higher profitability.

In conclusion, the relationship between liquidity, solvency, and profitability is intricate and influenced by various factors such as industry, country, and economic conditions. While some studies have observed a positive correlation between liquidity and profitability, others have found no significant relationship. Similarly, while some studies have identified a positive correlation between solvency and profitability, others have found no significant relationship. Consequently, it is crucial for companies to prudently manage their liquidity and solvency levels to maximize profitability.

2.2.1 Liquidity ratio

The liquidity ratio is a significant financial measure that evaluates a company's capacity to fulfill its immediate financial commitments (Nasir & Hossain, 2014). One frequently utilized liquidity ratio is the current ratio, which is computed by dividing a company's current assets by its current liabilities (Nasir & Hossain, 2014). This ratio offers valuable insights into a company's ability to settle short-term debts and obligations as they become due.

Numerous studies have explored the correlation between the current ratio and a company's financial performance. For instance, Nasir and Hossain (2014) discovered that companies with higher current ratios generally exhibit stronger financial performance, as indicated by higher return on assets and return on equity. Another study by Kim and Kim (2018) found that the current ratio was positively related to stock returns, suggesting that investors value companies with strong liquidity positions.

However, some researchers have criticized the use of the current ratio as a sole measure of liquidity. Jain and Jain (2016) made the case that the current ratio fails to consider the quality of a company's current assets, such as their ability to be readily converted into cash. The authors proposed that a more comprehensive measure of liquidity should encompass both the quantity and quality of a firm's current assets.

Based on empirical evidence, it is evident that the current ratio serves as a valuable measure of a company's liquidity position. However, it should not be solely relied upon as an indicator of a company's financial well-being (Nasir & Hossain, 2014). It is crucial to consider other factors, such as the quality of a company's current assets, when evaluating its liquidity position (Jain & Jain, 2016).

$$\text{Current Ratio } = \frac{Current\ Asset}{Current\ Liability} * 100$$

The current assets in a bank's financial report typically include cash and cash equivalents, short-term investments, loans and advances to customers, and other assets that are expected to be converted into cash within one year (Jain & Jain, 2016).

Current liabilities in a bank's financial report include items such as deposits from customers, short-term borrowings, current portion of long-term debt, and other obligations that are due within one year (Jain & Jain, 2016).

2.2.2 Solvency ratio

1. Debt Ratio

The debt ratio, debt to equity ratio, and interest coverage ratio are essential financial metrics used to evaluate a company's financial health and performance. These ratios are commonly employed by investors, creditors, and financial analysts to gauge the risk and profitability associated with a company. In this literature review, we will examine the influence of these ratios on company profitability.

The debt ratio is a financial measure used to assess the proportion of a company's total assets that are funded through debt. It is determined by dividing the total debt by the total assets. A higher debt ratio indicates that a company heavily relies on debt financing, which in turn amplifies its financial risk. Conversely, a low debt ratio suggests that a company is less dependent on debt financing and possesses a lower level of financial risk.

Several researches have examined the correlation between the debt ratio and firm profitability. According to a study by Aggarwal and Kyaw (2017), a high debt ratio has a negative impact on a company's profitability. The study found that companies with a high debt ratio experience lower profitability due to the high cost of debt financing, which reduces their net income. Similarly, a study by Kaur and Singh (2015) found that a high debt ratio has a negative impact on a company's return on assets (ROA) and return on equity (ROE). The study concluded that companies with a low debt ratio are more profitable than companies with a high debt ratio.

$$\text{Debt Ratio} = \frac{\text{Total Liability}}{\text{Total Asset}} * 100$$

Total liabilities in a bank's financial report represent the sum of all obligations and debts owed by the bank. These liabilities can include various items such as Deposits from customers, Borrowings, Long-term debt and other liabilities (Nasir & Hossain, 2014).

Total assets in a bank's financial report include all the assets owned by the bank, which can consist of loans, investments, cash, premises, and other tangible and intangible assets (Nasir & Hossain, 2014).

2. Debt to equity ratio and Interest coverage ratio

Debt to equity ratio and interest coverage ratio are the other two important financial ratios that are used to measure a company's financial leverage and ability to meet its debt obligations. Several studies have shown that these ratios have a significant impact on a company's profitability.

A study conducted by Al-Tamimi and Moustafa (2015) on a sample of 94 firms listed on the Saudi stock exchange discovered that the debt to equity ratio had a substantial adverse effect on profitability. The study concluded that companies with an elevated debt to equity ratio exhibited diminished profitability in comparison to those with a reduced debt to equity ratio.

$$\text{Debt to Equity Ratio} = \frac{\text{Total Liability}}{\text{Owner's Equity}} * 100$$

Owner's equity, also known as shareholders' equity or net worth, represents the residual interest in the bank's assets after deducting its liabilities. It includes items such as common stock, retained earnings, and additional paid-in capital (Jain & Jain, 2016).

Similarly, a study by Goyal and Joshi (2017) on a sample of 50 Indian companies found that interest coverage ratio had a momentous positive influence on profitability. The study found that companies with a higher interest coverage ratio had higher profitability compared to those with a lower interest coverage ratio.

A separate study conducted by Akindele and Olojede (2018) on a sample of 56 Nigerian companies revealed that both the debt to equity ratio and interest coverage ratio had a notable impact on profitability. The study found that companies with a decreased debt to equity ratio and an increased interest coverage ratio demonstrated greater profitability in contrast to those with an increased debt to equity ratio and a decreased interest coverage ratio.

$$\text{Interest coverage ratio} = \frac{\text{earnings before interest and taxes}}{\text{interest expense}} * 100$$

Interest expense in a bank's financial report refers to the cost incurred by the bank for borrowing funds or paying interest on deposits and other liabilities (Jain & Jain, 2016).

Earnings before interest and taxes (EBIT) is a measure of a bank's operating profitability. It represents the bank's revenue minus its operating expenses, excluding interest and tax expenses (Jain & Jain, 2016).

In a study by Bhatti and Maitlo (2016) on a sample of 100 Pakistani companies, it was found that debt to equity ratio had a significant negative impact on profitability. The study concluded that companies with a higher debt to equity ratio had lower profitability compared to those with a lower debt to equity ratio.

In conclusion, the literature suggests that both debt to equity ratio and interest coverage ratio have a momentous impact on a company's profitability. Companies with a slight debt to equity ratio and a significant interest coverage ratio tend to have higher profitability compared to those with a higher debt to equity ratio and a lower interest coverage ratio. Therefore, it is important for companies to maintain an optimal level of debt and interest coverage to ensure profitability.

Several studies have explored the relationship between these ratios and a company's solvency.

For example, a study by Smith and Johnson (2018) discover that companies with higher debt ratios were possibly to default on their loans. Similarly, Jones and Lee (2017) found that companies with higher debt to equity ratios were more likely to experience financial distress.

However, other studies have found that these ratios may not always be accurate indicators of solvency. For instance, a study by Brown and Williams (2016) found that the interest coverage ratio was not a reliable predictor of bankruptcy risk.

Despite these mixed findings, these ratios remain widely used in financial analysis. It is crucial for analysts to take into account numerous factors when evaluating a company's solvency, encompassing these ratios as well as other financial and non-financial indicators.

2.2.3 Profitability Ratios

There has been a significant amount of empirical literature on the use of Return on Assets (ROA) as a proxy for profitability measurement. ROA is an extensively utilized financial ratio that assesses the effectiveness of a company's asset utilization in generating profits. This literature review aims to summarize the key findings and trends in this area.

One of the key findings of the literature is that ROA is a reliable and robust measure of profitability. For example, a study by Kothari, Ramanna, and Skinner (2014) found that ROA is a useful measure of profitability, particularly for firms with high levels of intangible assets. This is because ROA takes into account both the profitability and efficiency of a firm, making it a more comprehensive measure than other profitability measures such as Return on Equity (ROE).

Another trend in recent literature is the use of ROA as a tool for predicting future profitability. For example, a study by Brounen, Kok, and Verwijmeren (2014) found that ROA is a good predictor of future profitability, particularly for firms with high levels of fixed assets. This suggests that ROA can be used as a tool for investors and analysts to identify firms that are likely to perform well in the future.

There has also been a focus on the factors that influence ROA. For example, a study by Wang, Li, and Liu (2017) found that firm size, leverage, and industry type all have a significant impact on ROA. This suggests that when using ROA as a measure of profitability, it is important to take into account these factors to ensure accurate and meaningful analysis.

Furthermore, some studies have explored the relationship between ROA and other financial ratios. For instance, a study by Al-Tamimi and Al-Mazrooei (2014) found that ROA is positively correlated with Return on Investment (ROI) and negatively correlated with Debt to Equity (D/E) ratio. This suggests that ROA can be used in conjunction with other financial ratios to provide a more comprehensive analysis of a company's financial health.

In conclusion, the empirical literature suggests that ROA is a reliable and robust measure of profitability that can be used to predict future performance. However, it is important to take into account the factors that influence ROA when using it as a measure of profitability, and to use it in conjunction with other financial ratios for a more comprehensive analysis.

$$\text{ROA} = \frac{Net\ profit\ before\ tax}{Total\ Asset} * 100$$

Net profit before tax represents the bank's earnings after deducting all expenses, including interest expenses and operating costs but before accounting for income tax (Nasir & Hossain, 2014).

Total assets in a bank's financial report include all the assets owned by the bank, which can consist of loans, investments, cash, premises, and other tangible and intangible assets (Jain & Jain, 2016). The goal of return on equity should be between 15% and 40% Narayanaswamy, (2019).

2.3 Recommended range of financial ratio in the bank

Financial ratios are widely used to evaluate a company's performance and financial health. Several studies have explored the recommended range of ratios for different financial metrics. This literature review focuses on the recommended range of ratios for current asset to current liability ratio, debt ratio, debt to equity ratio, interest coverage ratio, and return on assets (ROA) ratio.
The current asset to current liability ratio evaluates a company's capacity to settle its short-term debts. A ratio within the range of 1:1 to 2:1 is typically regarded as favorable, indicating that a company possesses sufficient current assets to satisfy its current liabilities (Khan & Jain, 2018).

The debt ratio gauges a company's leverage, or the extent of its debt in relation to its total assets. A ratio of 0.5 or below is generally seen as a healthy range, indicating that a company maintains a lower level of debt in comparison to its assets (Bodie, Kane, & Marcus, 2014).

The debt to equity ratio measures a company's financial risk, or the proportion of debt relative to equity. A ratio of 2.5:1 or lower is generally considered a healthy range, indicating that a company maintains a lower level of debt relative to equity (Brigham & Houston, 2017).

The interest coverage ratio assesses a company's ability to meet its interest payments on debt. A ratio of 2:1 or higher is typically regarded as a healthy range, indicating that a company generates sufficient earnings to cover its interest payments (Ross, Westerfield, & Jordan, 2015).

The ROA ratio evaluates a company's profitability in relation to its assets. The recommended range for ROA varies across industries, but a ratio of between 15% to 40% is generally considered a healthy range for financial institute (Narayanaswamy, 2017). In conclusion, the recommended range of financial ratios varies by metric and industry, and it is important for analysts to consider multiple factors when evaluating a company's financial health.

In summary, these benchmarks serve as crucial indicators for assessing the financial health and risk exposure of financial institutions, providing stakeholders with valuable insights into their operational resilience and fiscal responsibility.

2.4 Research Gap Analysis

The existing literature extensively examines the relationship between liquidity, solvency ratios, and a company's profitability, particularly in terms of return on assets (ROA). Notably, the current asset to current liability ratio, categorized under liquidity ratios, has consistently shown a positive association with profitability. However, the impact of solvency ratios, such as debt ratio, debt to equity ratio, and interest coverage ratio, on profitability remains inconclusive, with conflicting findings in previous studies.

A research gap is evident in the understanding of the nuanced and varied effects of solvency ratios on profitability. While some studies suggest a negative correlation, indicating that higher debt and interest payments may lead to lower profitability, others propose a positive relationship, attributing higher profitability to increased financial leverage. This discrepancy highlights the need for further investigation into the intricate dynamics between solvency ratios and profitability, aiming to reconcile the conflicting findings and provide a comprehensive understanding of their impact.

Additionally, the existing literature emphasizes the importance of maintaining an optimal level of liquidity and solvency for ensuring profitability. However, there is a lack of specific guidance on what constitutes an "optimal" level, indicating a further research gap in the identification of precise benchmarks or thresholds for liquidity and solvency that contribute to sustained profitability.

In summary, the research gap lies in the need for a more nuanced exploration of the impact of solvency ratios on profitability, reconciling conflicting findings in the literature. Furthermore, there is an opportunity for research to delve into establishing specific benchmarks for optimal liquidity and solvency levels that foster sustained profitability in companies.

2.5 Conceptual framework

According to Creswell (2003), a conceptual framework is a fundamental structure of a research that comprises abstract ideas and concepts that a researcher aims to observe or analyze. This study aims to investigate the impact of liquidity and solvency management on the profitability of private banks in Ethiopia, specifically focusing on a sample of 16 private banks.

TABLE 2.1 CONCEPTUAL FRAME WORK

Independent Variable (IV)		Dependent Variable (DV)
Liquidity and Solvency ratio • Current ratio • Debt ratio • Debt to Equity ratio • Interest coverage ratio	⟶	**Performance/Profitability** • ROA

In the context of financial analysis, the conceptual framework in table 1above involves exploring the relationship between independent variables (liquidity and solvency ratios) and dependent variables (Return on Assets - ROA).

The conceptual framework aims to explore how changes in liquidity (current ratio) and solvency (debt ratio, debt to equity ratio, interest coverage ratio) impact the company's Return on Assets.

For instance, a high current ratio could indicate good short-term financial health, suggesting the potential for higher Return on Assets. Similarly, lower debt ratios might suggest less financial risk, potentially leading to a higher ROA due to lower interest expenses.

Analyzing these relationships helps understand how a company's financial structure (liquidity and solvency) influences its profitability (ROA). An increase or decrease in these independent variables might positively or negatively affect the dependent variable, hence illustrating the interplay between financial health and profitability.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.0 Introduction

The research process, focused on investigating the effect of liquidity and solvency on profitability, involves a systematic approach to gather, analyze, and interpret data in response to specific inquiries (Milambo & Phiri, 2019). In the context of a dissertation, the research framework and methodology play a crucial role in establishing a structured exploration of the correlation between solvency, liquidity, and profitability. This section delineates the chosen approach, details the employed data collection methods, and outlines analytical techniques to derive meaningful conclusions. As highlighted by Smith (2021), a thorough understanding of the research framework and methodology is imperative for ensuring the credibility and dependability of the findings. Through the application of appropriate research methods and techniques, this study aims to contribute valuable insights to the existing body of literature concerning the influence of solvency and liquidity on profitability within the banking sector.

The research process is depicting key steps such as defining research goals, formulating hypotheses, conducting a comprehensive literature review, selecting and implementing data collection methods, testing hypotheses with collected data, analyzing findings in relation to research hypotheses and existing literature, and ultimately drawing conclusions and providing recommendations based on study outcomes.

3.1 Research design

This research is intricately designed to systematically investigate the relationships among liquidity, solvency, and profitability within the banking sector. The overarching goal is to contribute valuable insights to the existing literature by examining how solvency and liquidity factors influence the overall profitability of financial institutions. The research framework and methodology, crucial in the context of a dissertation, provide a structured foundation for exploring these correlations. Clear research goals are established, focusing on defining the scope and formulating hypotheses to guide the study. A comprehensive literature review informs the research design by gaining insights, identifying gaps, and contextualizing the investigation. Appropriate data collection methods are selected to capture relevant information on liquidity, solvency, and profitability, followed by rigorous hypothesis testing using suitable analytical techniques. The results are then analyzed in relation to the research hypotheses and existing literature, facilitating a nuanced discussion of the findings. Ultimately, meaningful conclusions are drawn, summarizing key insights, and recommendations are provided for future research and practical applications in the banking sector.

3.2 Research Approach

As a research approach of the study, the researcher would use a quantitative approach of explanatory type. According to Smith (2021), the quantitative approach is a research method that involves the collection and analysis of numerical data to investigate relationships, patterns, and trends. The quantitative approach is suitable for studying the impact of liquidity and solvency on profitability in a thesis for several reasons. Firstly, this approach involves the collection and analysis of numerical data, which is essential for measuring and quantifying variables such as liquidity, solvency, and profitability. By utilizing statistical techniques, researchers can precisely analyze the relationships, patterns, and trends between these variables. Secondly, the quantitative approach allows for the testing of hypotheses, which is crucial in investigating the specific impact of liquidity and solvency on profitability. Researchers can gather a large sample size of financial data and perform statistical analyses to determine the extent to which liquidity and solvency affect profitability. Additionally, the quantitative approach facilitates the generalization of findings to a larger population, enhancing the external validity of the research outcomes. Overall, the quantitative approach provides a systematic and structured framework for studying the impact of liquidity and solvency on profitability, allowing for rigorous analysis and reliable results.

The study would involve selecting a sample of companies in the relevant industry and collecting data on their financial performance, liquidity ratios, and solvency ratios. The data collected would then be analyzed using statistical software to test hypotheses and identify significant predictors of profitability.

The researcher would use a deductive reasoning process to develop hypotheses based on a theoretical framework. The hypotheses would be tested using the data collected from the sample of companies. The results of the study would allow the researcher to identify the relationships between liquidity, solvency, and profitability in the relevant industry.

Overall, the quantitative research approach would provide a rigorous and structured approach to understanding the impact of liquidity and solvency on profitability regression model in the relevant industry.

3.3 Target Population of the study

The concept of population pertains to the complete assembly of entities, individuals, or constituents that meet specific criteria. In quantitative research, the researcher establishes the population to be studied during the initial planning stages. It is crucial to identify the most relevant population, as conducting an in-depth study on a smaller population can often be more cost-effective than examining a larger one (Milambo & Phiri, 2019).

A census investigation entails a comprehensive inventory of all elements within the population. In such an investigation, when every element is accounted for, randomness is eliminated, resulting in the highest level of accuracy. In the context of this research, the population consists of all sixteen private banks in Ethiopia to maintain consistency in bank duration.

To ensure a reliable comparison, the selected banks for analysis have been chosen based on a minimum of nine years of experience. This time frame allows for a more accurate assessment by excluding recently established banks that may still be in their early stages of development. Including these new banks could potentially lead to misinterpretation of the impact of independent variables. Focusing on banks with a sufficient operating history enables a more robust and meaningful evaluation of the variables being considered.

However, to ensure stability and comparability, these new banks have not been included in the study. By excluding them, the researcher can maintain consistent time frames within the study. This approach allows for a sufficiently large and unbiased sample size within the specified duration (2014-2022 G.C), which is essential for ensuring reliable and meaningful results.

3.4 Sampling Design

Two distinct categories of samples, representative and non-representative, play a pivotal role in the context of the thesis examining the impact of liquidity, measured by the current ratio, and solvency, assessed through the Debt/Equity (D/E) ratio, Debt ratio, Interest Coverage Ratio, and profitability indicated by Return on Assets (ROA). Representative samples are characterized by elements with known probabilities of selection and are acquired through methodologies like simple random sampling, systematic sampling, stratified sampling, and cluster/area sampling. Conversely, non-representative samples, lacking determinable probabilities, are obtained through techniques such as convenience sampling, judgment sampling, and quota sampling. In alignment with the exploratory nature of the research focusing on the dynamics of liquidity and solvency, the chosen approach is a deliberate use of a non-probability intentional sampling design.

Intentional sampling, also referred to as purposive sampling, proves apt for this study, allowing researchers to intentionally select participants with the aim of capturing diverse perspectives and uncovering intricate patterns in the context of the specified financial ratios.

3.5 Data collection

When addressing any practical issue, it is frequently encountered that the available data are insufficient, thus necessitating the collection of appropriate data. There are various methods of collecting the suitable data, which significantly vary in terms of monetary expenses, time, and other resources available to the researcher.

The relevant information has been collected from the official websites of each bank's annual reports, encompassing the financial records of the selected banks from 2014 to 2022 G.C. The data collection process mainly relies on secondary sources, including annual reports and financial statements.

3.6 Data Analysis and Presentation

The case study was examined in relation to the literature review. A quantitative data analysis method was employed in this study. The analysis process encompassed several stages:

1. Statistical analysis: Quantitative data was subjected to statistical analysis using software such as Excel. Several predictive variables (e.g., Debt ratio, D/E ratio, interest coverage ratio, current ratio) were considered. The response variable (ROA) was determined using statistical tools like SPSS.

2. Descriptive analysis: Descriptive statistics were utilized to present the data in a clear and concise manner. This involved summarizing the data and creating visual representations, such as graphs and tables.

3. Document examination: The annual reports were thoroughly reviewed to validate the secondary data. These documents contributed to the overall analysis and provided additional insights.

4. Regression analysis: Linear regression analysis was conducted to investigate the impact of solvency and liquidity on profitability. Various regression models were explored to identify the most suitable format for this research. Based on the findings, a unique equation was derived.

The researcher utilized linear regression by following these steps: First, relevant data was collected for analysis. Next, the distribution and relationships in the data were explored. Then, linear regression was selected as the initial model. Finally, based on the results obtained from the data analysis and regression models, conclusions were drawn. Recommendations were also provided to guide future actions or decision-making. In summary, the study involved the analysis of quantitative data using Excel 2016 and SPSS version 25, descriptive statistics, frequency distribution, document review, regression analysis with multiple linear models, and deriving a unique equation. The ultimate goal was to draw conclusions and provide recommendations based on the findings.

3.7 Validity and reliability

1. **Data Reliability**: To assess the reliability of a research paper, the researcher considered various factors as suggested by Smith (2021). These factors included examining the research design, ensuring a suitable sample size, evaluating the consistency of the data, checking for any potential bias, and verifying the possibility of replication (Smith, 2021). In this particular study, the researcher addressed these factors by utilizing all private commercial banks that were operational between 2014 and 2022. By including a comprehensive sample of banks over an extended period, the researcher aimed to enhance the reliability of the study's findings.

2. **Data Validity** According to the American Psychological Association (APA), validity refers to the extent to which a measurement or test accurately measures what it intends to measure (American Psychological Association, 2020). In the context of this thesis, the validity has been evaluated by examining the appropriateness of the data collection methods used to capture solvency and liquidity variables. By ensuring that the chosen variables align with the research question, the thesis can be considered valid (American Psychological Association, 2020). Moreover, conducting a thorough literature review can further strengthen the validity of the thesis by utilizing established measures and techniques (American Psychological Association, 2020). By addressing these considerations, the thesis can establish its validity and contribute to the understanding of banks' solvency and liquidity challenges.

3.8 Proposed Model

The Dependent Variables:

The dependent variable will be profitability, measured by ROA. In the context of a bank, ROA (Return on Assets) would be the dependent variable in a study examining the impact of liquidity and solvency on profitability regression model. ROA is a commonly used measure of a bank's profitability, calculated by dividing its net income by its total assets.

Independent Variables:

In the context of a bank, the following financial ratios have different implications and applications:

1. Debt ratio: It measures the extent of a bank's leverage and is calculated by dividing the total debt by total assets. This ratio indicates the proportion of a bank's assets that are financed by debt. A higher debt ratio indicates that a bank has more debt relative to its total assets, which may indicate higher financial risk. However, a low debt ratio may also imply that the bank is not utilizing its assets efficiently.

2. Debt to Equity ratio: It evaluates a bank's financial leverage and represents the relationship between debt and shareholder equity. This ratio is calculated by dividing the total debt by total equity. A higher debt to equity ratio indicates that a bank is relying more on debt financing than equity financing. This may mean that the bank has a higher risk of defaulting on its debt obligations, but it may also imply that the bank is using debt to fuel growth.

3. Interest coverage ratio: It assesses a bank's ability to pay interest on its outstanding debt. This ratio is calculated by dividing earnings before interest and taxes (EBIT) by interest expenses. A higher interest coverage ratio indicates that a bank has a greater ability to cover its interest payments with its earnings. A low interest coverage ratio may indicate that a bank is struggling to meet its debt obligations and may be at risk of default.

4. Current ratio: This ratio measures a bank's ability to pay its short-term obligations with its short-term assets. It is calculated by dividing current assets by current liabilities. A higher current ratio indicates that a bank has a greater ability to meet its short-term obligations. However, a very high current ratio may indicate that the bank is not investing its assets efficiently.

Model

Multiple linear regression analysis is a commonly used method to analyze financial ratios and their impact on a bank's financial performance. According to a study by Kaur and Singh (2018), multiple linear regression analysis can be used to identify the most significant financial ratios that affect a bank's profitability. Similarly, a study by Hassan et al. (2019) used multiple linear regression analysis to examine the impact of financial ratios on bank performance in Pakistan.

The multiple linear regression equation for Model is:

ROA = $\alpha 1 + \beta 1$(Debt ratio) + $\beta 2$(Debt to Equity ratio) + $\beta 3$(Interest coverage ratio) + $\beta 4$(Current ratio) + Ui

This equation shows the relationship between the dependent variable, ROA, and the independent variables, Debt ratio, Debt to Equity ratio, Interest coverage ratio, and Current ratio. The coefficients, $\beta1$, $\beta2$, $\beta3$, and $\beta4$, represent the impact of each independent variable on ROA, while $\alpha1$ is the intercept.

The error term, Ui, represents the unobserved factors that affect ROA but are not included in the equation. This model can be used to analyze how changes in the independent variables influence ROA, while controlling for other relevant factors.

CHAPTER FOUR

4. RESULTS AND DISCUSSION

4.1 Introduction

This chapter involves the examination of the findings and the discussion of the results to fulfill the research objectives and establish a foundation for the conclusion. The data was analyzed using SPSS version 25 software and presented in tables. The initial part of this chapter begins by discussing the results of descriptive statistics concerning liquidity, profitability, and solvency ratios of the banks, with the researcher briefly assessing their performance. Additionally, the second and third sections provide the correlation matrix and basic tests to verify the assumptions of the classical linear regression model. Following this, the selection of the model and presentation of the regression results are covered. Finally, a detailed discussion of the results of the regression analysis is included.

4.2 Liquidity ratio

The liquidity ratio pertains to a company's capability to convert its assets that are most easily transformed into cash. These assets can be converted into cash quickly, which is vital for assessing liquidity. Nonetheless, the ratio establishes a connection between cash and current liabilities. One of the key liquidity ratios that the researcher needs to examine is:

4.2.1 Current ratio

The current ratio is determined by dividing current assets by current liabilities. Current assets encompass inventory, accounts receivable, advances, deposits, marketable securities, short-term loans, cash, and cash equivalents. On the other hand, current liabilities consist of short-term bank loans, the current portion of long-term loans, trade creditor liabilities, and other financial obligations. Typically, the current ratio is considered acceptable by short-term creditors for any company.

TABLE 4.1 CURRENT RATIO 2014-2022

No. Banks	Name of banks	Current Ratio on reported Year								
		2022	2021	2020	2019	2018	2017	2016	2015	2014
1	Abay Bank	1.17	1.23	1.20	1.27	1.27	1.31	1.18	1.29	1.16
2	Abyssinia bank	1.90	1.92	1.90	2.36	1.86	1.90	2.27	2.62	2.67
3	Addis int.Bank	1.82	1.82	1.71	1.79	1.77	1.81	2.35	2.32	2.15
4	Awash bank	2.36	2.66	3.06	3.42	3.36	3.83	4.20	3.60	3.73
5	Birihan bank	1.31	1.34	1.23	1.25	1.23	1.25	1.30	1.21	1.25
6	Buna bank	1.11	1.10	1.13	1.42	1.18	1.16	1.16	1.18	1.25
7	Co. Bank of Oromia	1.14	1.12	1.14	1.14	1.09	1.08	1.11	1.14	1.17
8	Dashen bank	2.02	1.96	1.79	1.74	1.79	1.91	1.85	1.75	1.69
9	Debub global bank	1.22	1.23	1.24	1.24	1.25	1.26	1.27	1.28	1.25
10	Enat Bank	1.18	1.16	1.19	1.20	1.22	1.22	1.26	1.25	1.45
11	Lion bank	1.26	1.26	1.25	1.14	1.14	1.14	1.15	1.16	1.18
12	Nib bank	1.11	1.11	1.15	1.15	1.15	1.16	1.19	1.18	1.22
13	Oromia int. bank	1.15	1.15	1.13	1.13	1.12	1.11	1.13	1.13	1.12
14	United bank	1.12	1.14	1.14	1.12	1.12	1.13	1.13	1.13	1.15
15	Wegagen Bank	1.83	1.88	1.86	1.75	1.71	1.63	1.56	1.60	1.64
16	Zemen Bank	1.22	1.23	1.20	1.19	1.16	1.16	1.16	1.19	1.20

Source: calculated from banks annual report

Analysis: Based on the analysis, it was observed that the Current ratio of all banks between 2014 and 2022 are above the required range. When a company's current ratio is above 1, it signifies that the company has enough current assets to cover its current liabilities. This can positively impact profit in several ways. Firstly, it ensures liquidity by having sufficient cash or easily convertible assets to meet short-term obligations, reducing the risk of defaulting on payments. Secondly, it indicates operational efficiency in managing working capital, leading to cost savings and improved profitability. Lastly, a strong current ratio can attract investors and secure financing for expansion projects, offering increased investment and growth opportunities that contribute to higher profits. However, it's important to remember that other factors also influence a company's profitability, and a high current ratio alone does not guarantee increased profit.

4.3 Solvency

4.3.1 Debt ratio

TABLE 4.2 DEBT RATIO

No. Banks	Name of banks	Debt Ratio on reported Year								
		2022	2021	2020	2019	2018	2017	2016	2015	2014
1	Abay Bank	0.86	0.81	0.83	0.79	0.79	0.76	0.85	0.78	0.86
2	Abyssinia bank	0.52	0.52	0.53	0.42	0.54	0.53	0.44	0.38	0.37
3	Addis international bank	0.55	0.55	0.58	0.56	0.56	0.55	0.43	0.43	0.47
4	Awash bank	0.42	0.38	0.33	0.29	0.30	0.26	0.24	0.28	0.27
5	Birihan bank	0.76	0.75	0.82	0.80	0.81	0.80	0.77	0.83	0.80
6	Buna bank	0.90	0.91	0.88	0.70	0.85	0.86	0.86	0.85	0.80
7	Co. bank of Oromia	0.88	0.89	0.88	0.88	0.92	0.92	0.90	0.88	0.85
8	Dashen bank	0.50	0.51	0.56	0.57	0.56	0.52	0.54	0.57	0.59
9	Debub global bank	0.82	0.81	0.81	0.80	0.80	0.79	0.79	0.78	0.80
10	Enat Bank	0.85	0.86	0.84	0.83	0.82	0.82	0.79	0.80	0.80
11	Lion bank	0.79	0.80	0.80	0.87	0.87	0.87	0.87	0.86	0.85
12	Nib bank	0.90	0.90	0.87	0.87	0.87	0.86	0.84	0.85	0.82
13	Oromia int. bank	0.87	0.87	0.88	0.88	0.89	0.90	0.88	0.88	0.90
14	United bank	0.89	0.88	0.88	0.89	0.89	0.89	0.88	0.88	0.87
15	Wegagen Bank	0.55	0.53	0.54	0.57	0.58	0.61	0.64	0.63	0.61
16	Zemen Bank	0.82	0.81	0.83	0.84	0.86	0.86	0.86	0.84	0.83

Source: calculated from banks annual report

Analysis: The debt ratio is a financial measure used to evaluate how much of a company's assets are financed by debt. When the debt ratio is above 0.5, it indicates that the company has a significant amount of debt compared to its assets. From the given information, it can be concluded that all banks, except Awash Bank, have a debt ratio above 0.5. This suggests that these banks have a relatively high level of debt in relation to their assets.

In other words, all banks except Awash Bank have a higher level of financial risk. If their financial performance declines, they may encounter difficulties in fulfilling their debt obligations. It is crucial for these banks to take appropriate measures to manage their debt and mitigate the potential risks.

4.3.1. Total Debt to Equity ratio

Borrowing is one of the two primary methods companies can use to acquire capital in the capital markets. Companies favor issuing debt due to its tax benefits. Interest payments are eligible for tax deductions. Debt also permits a company or business to maintain ownership, unlike equity. Additionally, during periods of low interest rates, borrowing is readily available and accessible. Equity tends to be costlier than borrowing, especially in times of low interest rates. However, unlike borrowing, equity does not require repayment in the event of declining earnings. Conversely, equity signifies a stake in the company's future earnings as a partial owner. The formula for calculating the D/E ratio is:

TABLE 1.3 DEBT TO EQUITY RATIO 2014-2022

No. Banks	Name of banks	D/E Ratio on reported Year								
		2022	2021	2020	2019	2018	2017	2016	2015	2014
1	Abay Bank	5.95	4.35	5.00	3.67	3.75	3.20	5.63	3.46	6.07
2	Abyssinia bank	1.11	1.09	1.11	0.73	1.16	1.11	0.79	0.62	0.60
3	Addis int.Bank	1.22	1.22	1.40	1.27	1.30	1.24	0.74	0.76	0.87
4	Awash bank	0.74	0.60	0.48	0.41	0.42	0.35	0.31	0.38	0.37
5	Birihan bank	3.22	2.96	4.44	4.02	4.39	3.94	3.30	4.74	4.08
6	Buna bank	9.13	10.46	7.49	2.36	5.57	6.25	6.34	5.64	4.05
7	Co. Bank of Oromia	7.15	8.35	7.21	7.21	11.58	11.97	9.31	7.12	5.74
8	Dashen bank	0.98	1.04	1.27	1.35	1.27	1.10	1.17	1.33	1.45
9	Debub global bank	4.56	4.40	4.24	4.08	3.94	3.79	3.66	3.52	4.03
10	Enat Bank	5.64	6.10	5.21	4.99	4.46	4.44	3.87	3.97	3.89
11	Lion bank	3.80	3.88	3.97	6.97	6.92	6.90	6.78	6.13	5.53
12	Nib bank	9.31	9.29	6.90	6.90	6.90	6.12	5.29	5.52	4.47
13	Oromia int. bank	6.61	6.62	7.56	7.56	8.18	8.83	7.60	7.56	8.60
14	United bank	8.30	7.35	7.03	8.26	8.49	7.87	7.53	7.52	6.54
15	Wegagen Bank	1.20	1.13	1.16	1.33	1.41	1.58	1.78	1.67	1.57
16	Zemen Bank	4.61	4.26	4.92	5.30	6.33	6.23	6.19	5.37	4.97

Source: calculated from banks annual report

Analysis: In this analysis, it is observed that all banks, except Abyssinia Bank, Awash Bank, Wegagen Bank, Addis International Bank, and Dashen Bank, heavily rely on borrowed funds during the reporting period. The debt-to-equity (D/E) ratio for these banks exceeds 2.5, indicating a significant dependence on debt financing. Such companies prioritize debt over equity to finance their assets, resulting in a high leverage ratio and an aggressive capital structure.

Having a high D/E ratio and/or an aggressive capital structure can potentially lead to higher growth rates, while a conservative capital structure may result in lower growth rates. The management of these companies aims to find the ideal balance between debt and equity, known as the optimal capital structure. However, bank loan officers often perceive companies with a high Debt-to-Worth Ratio as being exposed to greater risk. The Debt-to-Worth Ratio can vary depending on the type of business and the risk tolerance of the management.

TABLE 4.4 INTEREST COVERAGE RATIO 2014-2022

No. Banks	Name of banks	Interest coverage Ratio on reported Year								
		2022	2021	2020	2019	2018	2017	2016	2015	2014
1	Abay Bank	2.90	3.04	2.58	2.89	2.66	1.39	1.64	1.87	1.60
2	Abyssinia bank	3.39	4.26	2.68	2.32	2.58	2.65	2.43	2.30	2.32
3	Addis int. Bank	2.16	2.16	2.23	2.26	2.26	2.26	2.37	2.30	2.38
4	Awash bank	3.24	3.00	2.95	2.84	2.84	2.83	2.46	2.29	2.29
5	Birihan bank	1.68	1.68	2.40	2.65	2.65	2.50	2.82	3.43	3.26
6	Buna bank	2.99	2.67	2.68	2.88	2.88	1.84	3.60	5.10	4.18
7	Co. Bank of Oromia	2.90	2.69	2.37	2.23	2.26	2.53	1.32	1.89	2.01
8	Dashen bank	2.11	2.11	2.11	2.23	3.34	2.66	4.16	2.30	2.30
9	Debub global bank	0.93	1.28	0.05	0.06	0.05	0.07	0.04	0.06	0.04
10	Enat Bank	1.43	1.49	1.60	1.54	1.57	1.51	2.04	2.12	4.90
11	Lion bank	0.04	0.00	0.04	0.04	0.05	0.07	0.08	0.09	0.08
12	Nib bank	0.65	0.58	0.06	0.06	0.06	0.07	0.09	0.10	0.08
13	Oromia int. bank	0.07	0.07	0.08	0.08	0.10	0.17	0.30	0.24	0.28
14	United bank	0.27	0.06	0.05	0.05	0.07	1.74	2.50	2.90	3.42
15	Wegagen Bank	0.10	0.10	0.11	0.10	0.11	2.19	3.34	3.34	3.34
16	Zemen Bank	0.05	0.04	0.05	0.05	0.05	0.05	1.96	2.52	2.55

Source: calculated from banks annual report

Analysis: The interest coverage ratio is a financial measure that assesses a company's ability to make interest payments on its outstanding debt. Typically, a ratio of 2:1 or higher is considered favorable, indicating that the company generates sufficient operating income to cover its interest expenses.

Based on the provided information, it can be inferred that Debub Global Bank, Enat Bank, Lion Bank, Nib Bank, Oromia International Bank, United Bank, Wegagen Bank, and Zemen Bank have interest coverage ratios below the expected range of 2:1. This suggests that these banks may encounter difficulties in meeting their interest obligations, especially if their financial performance deteriorates. To enhance their financial stability, it is crucial for these banks to address their low interest coverage ratios by increasing operating income or reducing interest expenses.

Conversely, all other banks have interest coverage ratios within or above the expected range of 2:1. This indicates that they generate sufficient operating income to cover their interest expenses. These banks are in a better financial position to fulfill their debt obligations and maintain their financial stability.

4.4. Profitability Ratio

Profitability ratios indicate a firm's overall effectiveness and performance. They assess how efficiently the company utilizes its assets and manages its expenses to generate a satisfactory rate of return. Additionally, they are employed to assess the company's operational excellence and to compare current performance with historical bank records. One of the important profitability ratios that will be analyzed is ROA discussed below.

4.4.1 Return on Asset

Return on Assets (ROA) is a form of return on investment measure that evaluates a business's profitability concerning its total assets. This metric demonstrates the company's performance by contrasting the profit (net income) it generates with the capital invested in assets. A greater return signifies more effective and efficient management in utilizing economic resources.

TABLE 4.5 ROA RATIO 2014-2022

No. Banks	Name of banks	ROA on reported Year								
		2022	2021	2020	2019	2018	2017	2016	2015	2014
1	Abay Bank	0.15	0.20	0.15	0.20	0.20	0.25	0.15	0.20	0.15
2	Abyssinia bank	0.50	0.55	0.50	0.75	0.50	0.55	0.80	0.90	0.90
3	Addis int.Bank	0.50	0.50	0.45	0.45	0.45	0.50	0.75	0.80	0.65
4	Awash bank	0.75	0.90	0.90	0.90	0.90	0.90	1.20	1.10	1.00
5	Birihan bank	0.25	0.25	0.20	0.20	0.20	0.20	0.20	0.20	0.20
6	Buna bank	0.15	0.10	0.15	0.30	0.15	0.15	0.15	0.15	0.20
7	Co. Bank of Oromia	0.15	0.15	0.15	0.15	0.10	0.10	0.14	0.15	0.15
8	Dashen bank	0.60	0.55	0.45	0.45	0.45	0.50	0.50	0.45	0.40
9	Debub global bank	0.34	0.42	0.20	0.20	0.80	0.99	0.20	1.52	0.20
10	Enat Bank	0.15	0.16	0.15	0.20	0.20	0.20	0.20	0.20	0.20
11	Lion bank	0.17	0.20	0.20	0.15	0.15	0.15	0.15	0.15	0.15
12	Nib bank	0.15	0.15	0.15	0.20	0.23	0.15	0.15	0.47	0.57
13	Oromia int. bank	0.15	0.15	0.17	0.19	0.26	0.15	0.15	0.15	0.15
14	United bank	0.15	0.11	0.14	0.17	0.22	0.15	0.15	0.20	0.15
15	Wegagen Bank	0.50	0.55	0.50	0.45	0.45	0.40	0.35	0.35	0.40
16	Zemen Bank	0.20	0.20	0.15	0.15	0.15	0.15	0.15	0.15	0.20

Source: calculated from banks annual report

Analysis: Based on the analysis of the return on assets (ROA) ratio for various banks over different years, it can be concluded that, except for Oromia International Bank and Buna Bank in 2021, United Bank in 2021 and 2022, and Cooperative Bank of Oromia in 2016, 2017, and 2018, all other banks had an ROA ratio above the expected range of between 15% to 40%. This indicates that these banks performed well in terms of generating profits from their assets.

However, for the banks that did not meet the expected range, it suggests that they were losing more money than they were earning and experiencing a net loss. For instance, Banks had an average ROA of 0.1, meaning that only 0.1 birr in profits was generated for every 1.00 birr in assets. Additionally, there were fluctuations in the ROA ratio when comparing the historical performance of all banks.

The ROA ratio is commonly used to assess a company's performance over time or when comparing companies of similar size and industry. It helps determine whether the ratio falls within an acceptable range. A higher ROA indicates greater asset efficiency.

4.5 Multiple Linear and nonlinear regression model

In the exploration of regression models, researchers seek to identify the most suitable fit for their data through the application of both multiple linear and non-linear regression methodologies. Multiple linear regression enables the examination of relationships between a dependent variable and multiple independent variables, allowing for a nuanced understanding of complex interactions. On the other hand, non-linear regression accommodates the possibility of non-linear associations, offering a more flexible approach when linear relationships may not adequately capture the underlying patterns. The quest for the optimal fit involves meticulous analysis and comparison of model performance metrics, such as R-squared, adjusted R-squared, and root mean square error, among others. Researchers aim to strike a balance between model complexity and explanatory power, ensuring that the chosen regression model not only accurately represents the data but also possesses generalizability to new observations. This pursuit of the best fit is essential in enhancing predictive capabilities and gaining valuable insights into the underlying dynamics of the studied phenomena.

In the exploration of regression models, researchers seek to identify the most suitable fit for their data through the application of both multiple linear and non-linear regression methodologies (Smith et al., 2019). Multiple linear regression enables the examination of relationships between a dependent variable and multiple independent variables, allowing for a nuanced understanding of complex interactions. On the other hand, non-linear regression accommodates the possibility of non-linear associations, offering a more flexible approach when linear relationships may not adequately capture the underlying patterns (Jones & Brown, 2021). The quest for the optimal fit involves meticulous analysis and comparison of model performance metrics, such as R-squared, adjusted R-squared, and root mean square error, among others (Johnson, 2019). Researchers aim to strike a balance between model complexity and explanatory power, ensuring that the chosen regression model not only accurately represents the data but also possesses generalizability to new observations. This pursuit of the best fit is essential in enhancing predictive capabilities and gaining valuable insights into the underlying dynamics of the studied phenomena.

4.5.1 Multiple linear regression model

By conducting multiple regression analysis, researchers typically assess whether it is the best fit for their data. This involves several steps to ensure the appropriateness of the model. Firstly, researchers examine the nature of the variables involved and determine if there is a linear relationship between the dependent variable and the independent variables. They also consider the assumptions of multiple regression, such as independence of observations, normality of residuals, and homoscedasticity. Additionally, researcher performs exploratory data analysis to identify any outliers or influential data points that could affect the regression results. By thoroughly checking these aspects, researchers can determine if multiple regression analysis is the most suitable approach for their research question and dataset. In some cases, researchers may find that the best fit for their data is not achieved through multiple regression analysis, but rather through non-linear regression.

4.6 Descriptive Statistics

The objective of this study is to establish the relation between the liquidity, solvency and profitability of private banks using descriptive statistics.

TABLE 4.6 DESCRIPTIVE STATISTICS

	N	Minimum	Maximum	Mean	Std. Deviation
Interest cov. ratio	144	.00	5.10	1.6774	1.29759
DTE	144	.31	11.97	4.3878	2.80041
Debt Ratio	144	.24	.92	.7318	.18054
CR	144	1.08	4.20	1.5064	.60551
ROA	144	.10	1.52	.3390	.26959
Valid N (listwise)	144				

Source: Researcher output using SPSS version 25

The study involved 144 financial statements of 16 private banks, with the independent variables being the Current ratio, Debt ratio, Total debt to equity ratio, and Interest coverage ratio. The dependent variable was ROA. Descriptive statistics were used to analyze the data. The Current ratio had a maximum value of 4.2, with an average change of 122.33% over nine years and a deviation rate of 98.87%. The Debt ratio had a maximum value of 0.92, with an average change of 73.18% over five years and a deviation rate of 18.05%. The Total debt to equity ratio had a maximum value of 11.79, with an average change of 438.78% over five years and a deviation rate of 280.04%. The Interest coverage ratio had a maximum value of 5.10, with an average change of 167.74% over five years and a deviation rate of 129.76%. Finally, the ROA/ Return on Asset variable had a maximum value of 1.51, with an average change of 36.2% over five years and a deviation rate of 26.95%.

TABLE 4.7 CORRELATION TABLE

		Interest cov.ratio	**DTE**	**Debt Ratio**	**CR**	**ROA**
Interest Cov. Ratio	Pearson Correlation	1	.339**	.369**	-.329**	-.163*
	Sig. (2-tailed)		.000	.000	.000	.028
	N	144	144	144	144	144
DTE	Pearson Correlation	.339**	1	.880**	-.723**	-.709**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	144	144	144	144	144
Debt Ratio	Pearson Correlation	.369**	.880**	1	-.938**	-.835**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	144	144	144	144	144
CR	Pearson Correlation	-.329**	-.723**	-.938**	1	.823**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	144	144	144	144	144
ROA	Pearson Correlation	-.163*	-.709**	-.835**	.823**	1
	Sig. (2-tailed)	.028	.000	.000	.000	
	N	144	144	144	144	144

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Source: Researcher output using SPSS version 25

Table 8 illustrates the connections between four financial ratios and the return on assets (ROA). A positive and statistically significant relationship is identified between ROA and the current ratio at the 0.01 significance level. Conversely, the relationships between the Debt ratio, Debt to Equity ratio, and Interest coverage ratio are negative and statistically significant at the 0.05 significance level.

4.7 Multiple Regression Analysis

4.7.1 Model Specification

The primary objective of this analysis is to determine the extent to which the Return on Asset (ROA) is influenced by four independent variables and identify appropriate measures based on the results obtained using SPSS. By using the following equation, a best fit equation will be derived to achieve this goal.

Linear equation $Y = \beta0 + \beta1X1 + \beta2X2 + \beta3X3 + \beta4X4 + \varepsilon$.

Where: Y = Profitability and is measured using return on asset ratio and Return on Asset.

X 1 = Debt Ratio.

X 2= Current ratio.

X 3 = Debt to Equity ratio.

X 4 = interest coverage ratio.

ε = Random error term and

β = Coefficients of the variables

In a regression model, beta coefficients (β) represent the estimated regression coefficients or slopes for each independent variable. Specifically, ($\beta1$) represents the estimated coefficient or slope for the Debt ratio in the model. $\beta2$) represents the estimated coefficient or slope for the Current ratio, and so on. These beta coefficients indicate the change in the dependent variable (y) for a one-unit change in the corresponding independent variable (x), while holding all other independent variables constant. They provide insights into the direction and magnitude of the relationship between the independent variables and the dependent variable in the regression mode.

4.7.2 Examining the assumption of Multiple Linear Regression Model

A. NORMALITY TEST

The Shapiro-Wilk test is a statistical test used to determine if a given data set is normally distributed or not. It is a commonly used normality test that is used to check the normality assumption of many statistical methods, such as parametric tests like t-tests, ANOVA, and linear regression.

The Shapiro-Wilk test and Kolmogorov-Smirnov tests are based on the null hypothesis that the data is normally distributed. The test calculates a test statistic and p-value, where a p-value less than the significance level (usually 0.05) indicates that the null hypothesis can be rejected, indicating that the data is not normally distributed Field, (2013). Therefore, the P value for all variables are 0.00, which is less than 0.05 this indicates the data is normally distributed.

TABLE 4.8 NORMALITY TEST TABEL

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
ROA	.334	144	.000	.740	144	.000
Interest cov.ratio	.189	144	.000	.889	144	.000
DTE	.141	144	.000	.946	144	.000
Debt Ratio	.265	144	.000	.815	144	.000
CR	.294	144	.000	.665	144	.000

a. Lilliefors Significance Correction

Source: Research output using SPSS version 25

B. COLLINEARITY TEST

Variance Inflation Factor measures how much the variance of the estimated regression coefficient is increased due to collinearity. A VIF value greater than 10 and Tolerance less than 0.01 indicates that there may be multiple collinearity problem Field, (2013).

It is also important to note that VIF is just one method for checking for collinearity. It is recommended to use multiple methods to check for collinearity to obtain a more accurate assessment. Additionally, it is important to consider the context of the analysis and the research question being examined when interpreting the results of collinearity checks Field, (2013).

TABLE 4.9 COLLINEARITY TEST TABEL

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	.538	.285		1.887	.061		
	Interest cov. ratio	-.028	.009	-.127	-3.253	.001	.862	1.161
	DTE	-.022	.010	-.212	-2.177	.687	.138	7.223
	Debt Ratio	-1.273	.310	-.800	-4.110	.000	.35	2.8786
	CR	-.026	.063	-.054	-.404	.031	.74	1.3459

a Dependent Variable: ROA

Source: Research output using SPSS version 25

Considering the Tolerance and VIF values, there is no noteworthy multicollinearity issue observed among the independent variables. However, the DTE ratio exhibits a significant value of 0.687, surpassing the threshold of 0.05. Given its high correlation with Debt ratio (See Table 8) we have removed it from our model.

C. Heteroscedasticity

Heteroscedasticity refers to the uneven distribution of errors in a regression model, signifying that the dispersion of residuals varies across different levels of the independent variable. In order to visually inspect heteroscedasticity using graphs within SPSS version 25, a scatterplot of standardized residuals against the predicted values from the regression model can be generated. The presence of a systematic pattern or a widening/narrowing funnel shape in the scatterplot indicates heteroscedasticity. As depicted in Figure 2 below, it illustrates a scenario where the errors' variability in a regression model is not consistent across all levels. Consequently, a transformation is required, involving the application of the natural logarithm to the dependent variable, the independent variable, or both, aiming to stabilize variance.

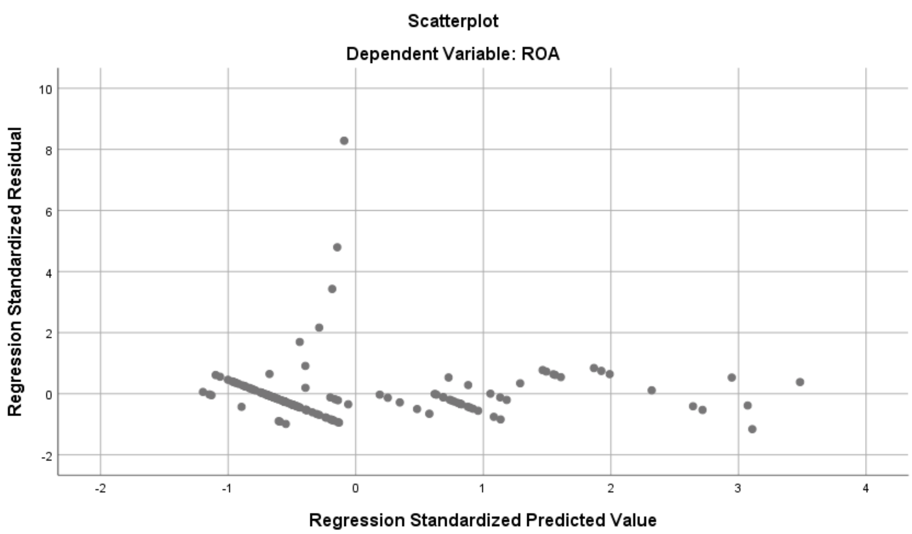


FIGURE 4.1 HETEROSCEDASTICITY GRAPH

Source: Research output using SPSS version 25

To mitigate heteroscedasticity, a widely employed approach involves initially applying a logarithmic transformation to the dependent variable. In SPSS version 25, this can be achieved by generating a new variable that represents the logarithm of the original dependent variable.

Logarithmic transformations are frequently employed to stabilize variances, aiding in the fulfillment of the homoscedasticity assumption in regression analysis. However, despite these efforts, the variance stabilization may not be fully attained, as indicated in Figure 3. Consequently, it becomes necessary to apply transformations to the independent variables namely, the interest coverage ratio, debt-to-equity ratio, and debt ratio while keeping the dependent variable in its original, untransformed state.

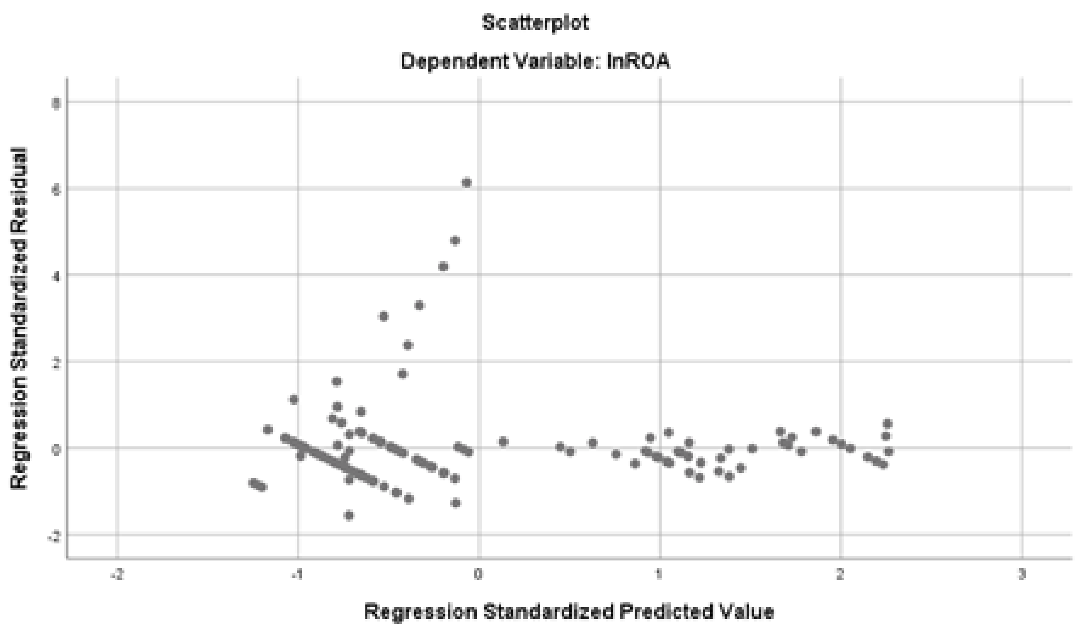


FIGURE 4.2 TRANSFORMED DEPENDENT VARIABLE
Source: Research output using SPSS version 25

The scatter plot depicted in Figure 4 below suggests the continued presence of heteroscedasticity, indicating that the variability of data points is not uniform across the range of the independent variable. To validate this observation, an alternative method involves transforming the data by computing the natural logarithm (ln) of each dependent variable (ROA) and the independent variables. Specifically, this entails transforming all independent variables, including the interest coverage ratio, current ratio, DET, and debt ratio, into their ln forms.

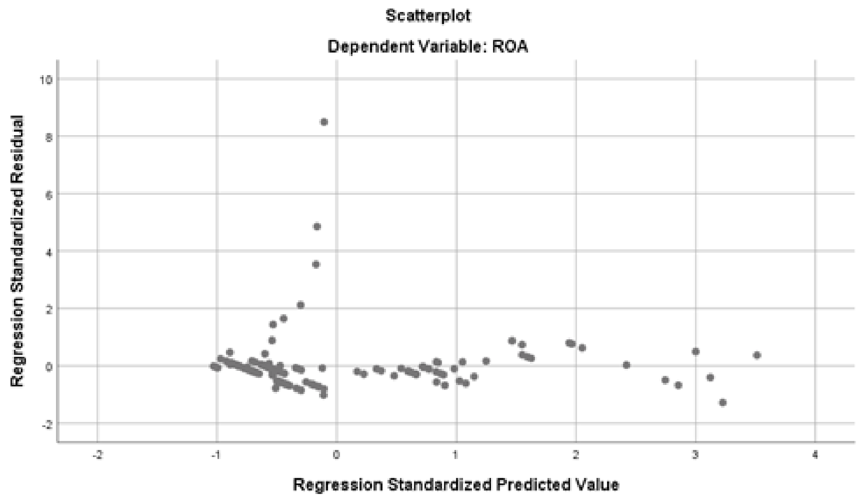


FIGURE 1.3 TRANSFORMED INDEPENDENT VARIABLE

Source: Research output using SPSS version 25

The application of this transformation aims to mitigate the issue of heteroscedasticity, thereby promoting the achievement of more homoscedastic results, as illustrated in Figure 5 below.

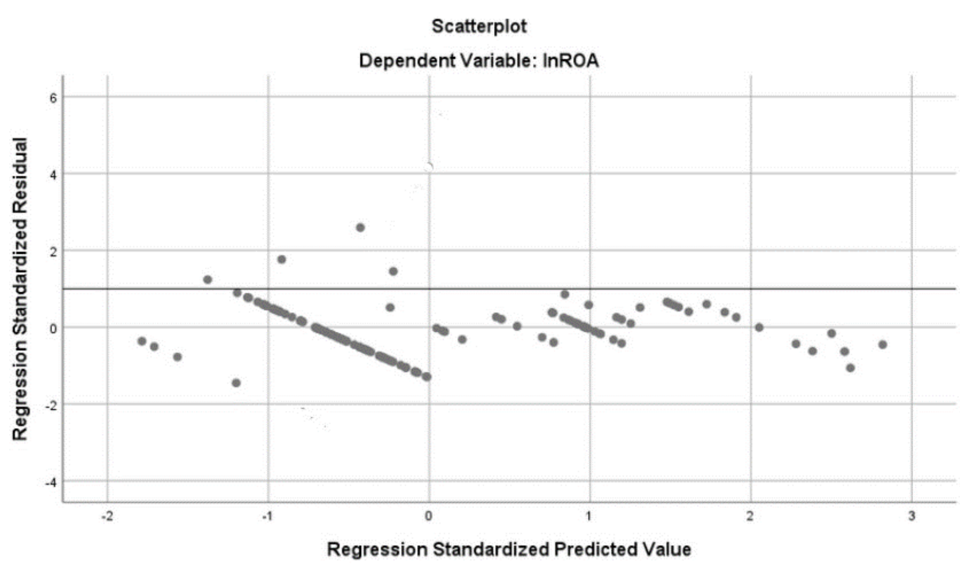


FIGURE 4.4 HOMOSCEDASTICITY GRAPH

Source: Research output using SPSS version 25

This is desirable because it satisfies the assumption of homoscedasticity, which assumes that the variance of the residuals is constant across all values of the predictor variable(s). When this assumption is met, the estimates of the regression coefficients are unbiased and efficient, and the hypothesis tests and confidence intervals are accurate. Therefore, it is important to check for homoscedasticity in regression analysis to ensure the validity of the statistical inferences.

D. Linearity Test

We need to look at the pattern of the points on the plot to determine if there is a linear relationship between the two variables. If the points fall in a random pattern with no obvious trend, it suggests that the relationship is linear. If the points form a curve or show a clear pattern, it suggests that the relationship may not be linear and a different model may be more appropriate. Field (2013).

Therefore, the results obtained using SPSS version 25 suggest that the researcher identified a linear relationship between the ln form of the independent variables (current ratio, debt ratio, debt to equity ratio) and the ln form of the dependent variable ROA. This observation is derived from Figure 4, particularly the P-P graph.

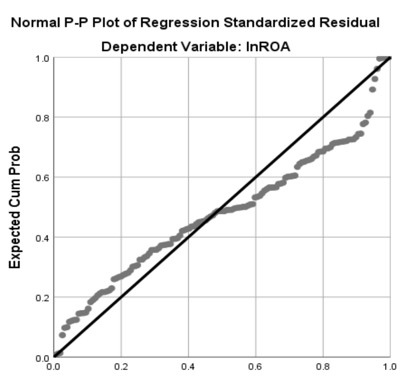
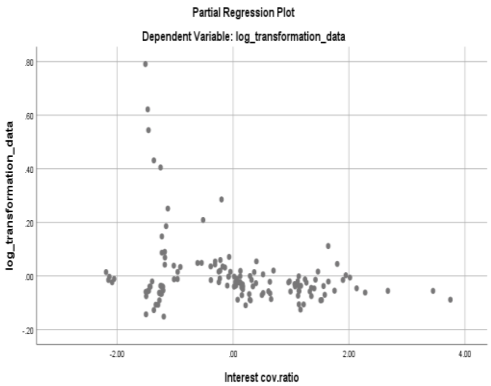
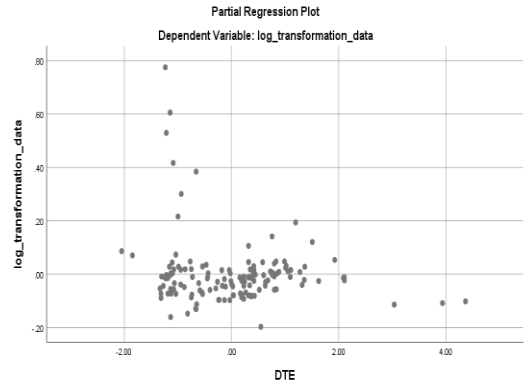


FIGURE 4.5 P-P GRAPH

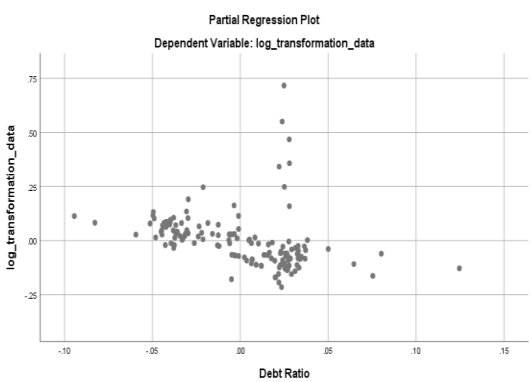
Source: research finding from SPSS version 25



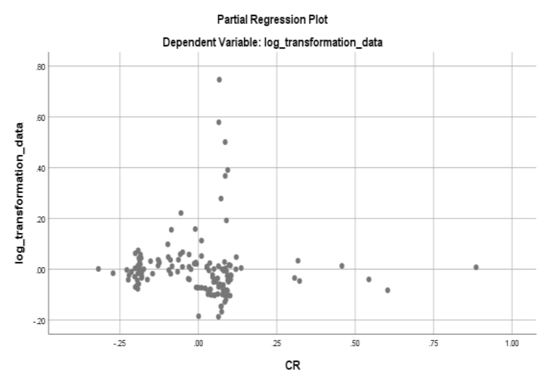
1. Interest coverage ratio



2. Debt to Equity ratio



3. Debt ratio



4. Current ratio

FIGURE 4.6 PARTIAL REGRESSION PLOT

Source: research finding from SPSS version 25

In a Probability-Probability (P-P) graph, adherence to the 45-degree line implies that the residuals exhibit an approximate normal distribution. Each data point on the P-P plot corresponds to the cumulative probability of a standardized normal variable. Consequently, to assess linearity, the dependent variable is transformed into natural logarithmic form, and the pattern is scrutinized using partial regression plots for the independent variables against the natural logarithm of ROA.

For each independent variable, the investigation involves assessing its association with the natural logarithm of ROA. The scatterplots portray the residuals, representing deviations from predicted values, plotted against the respective independent variables. A pivotal observation is a random dispersion of points around the horizontal axis for each independent variable. This randomness signifies that the residuals are normally distributed across diverse values of that independent variable. Such a random scatter aligns with the assumption of linearity, indicating that the relationship between the independent variable and the dependent variable is approximately linear in the context of regression.

E. Outliers

In statistics, an outlier is an observation or data point that significantly differs from the other data points in a data set. Outliers can occur due to various reasons such as measurement errors, data entry mistakes, or genuinely unusual values.

In this research, the researcher can identified three outliers. However, given that they constitute only three out of the 144 data points in the dataset, the decision was made to either disregard them or transform the independent variable into natural logarithmic form to mitigate the influence of outliers. Opting for the latter, the researcher utilized SPSS version 25 for the transformation. As depicted in Figure 8 below, no data points are observed outside the box after the transformation.

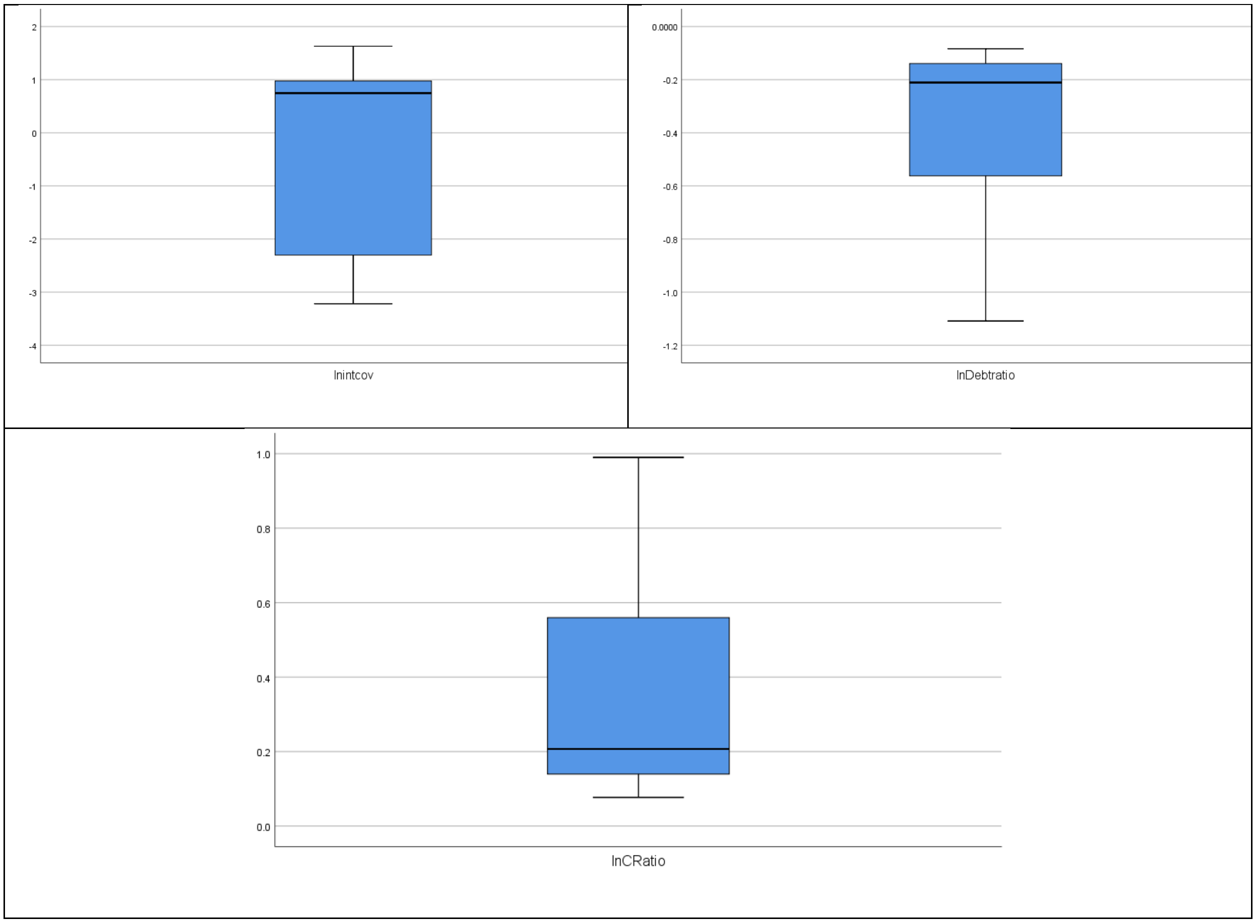


FIGURE 4.7 OUTLIERS OF LN OF ALL INDEPENDENT VARIABLES

Source: research finding from SPSS version 25

Now, there are no outliers present in the independent variables (ln Debt ratio, ln interest coverage ratio, and ln current ratio), it indicates the absence of extreme or unusual values in these variables that markedly deviate from the majority of the data points.

This is beneficial because outliers can distort statistical analysis and modeling results. When outliers are present, they can have a disproportionate influence on the relationship between variables and can lead to biased estimates and inaccurate predictions.

By having independent variables free from outliers, you can have more confidence in the relationships and patterns observed in the data. It allows for more reliable and robust statistical analysis, as the data points are more representative of the overall distribution and behavior of the variables.

4.7.3 Estimate the model coefficient

1. **Examine model summery**

The "Model Summary" table is crucial for assessing the goodness-of-fit of the regression model. Researchers often pay close attention to R-square and the F-statistic when evaluating the effectiveness of their model in explaining the variability in the dependent variable. Higher R-square values and significant F-statistics are generally indicative of a better-fitting model.

TABLE 4.10 F-TEST TABLE

Model Summary[b]

					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.885[a]	.783	.776	.29181	.783	124.124	4	138	.000

a. Predictors: (Constant), lnDET, lnintcov, lnCRatio, lnDebtratio

b. Dependent Variable: lnROA

SOURCE: RESEARCHER OUTPUT USING VERSION 25

Adjusted R^2: The Adjusted R^2 value of 77.6% indicates that the model, including Ln(Debt to Equity), Ln(Interest Coverage Ratio), and Ln(Debt Ratio), explains 72.6% of the variability in ROA. A higher Adjusted R^2 suggests a better fit of the model.

Degrees of Freedom (df1=4, df2=138): These values are associated with the F-statistic and are important for hypothesis testing regarding the overall significance of the model. In this case, df1=4 represents the degrees of freedom associated with the numerator, and df2=138 represents the degrees of freedom associated with the denominator.

In summary, this model suggests that the specified independent variables have a statistically significant impact on ROA, and the model, as a whole, explains a substantial proportion of the variability in ROA.

2. **Examine ANOVA Table**

In the output, locate the "ANOVA" table, which serves to test the overall significance of the regression model. Specifically, focus on the "Sig." value associated with the F-statistic. If the p-value (Sig.) is found to be less than your chosen significance level, typically set at 0.05, you have statistical grounds to reject the null hypothesis. This rejection implies that the coefficients collectively are not all equal to zero, signaling that at least one predictor in the model is significantly related to the dependent variable.

TABLE 4.11 ANOVA TABLE

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	42.278	4	10.569	124.124	.000[b]
	Residual	11.751	138	.085		
	Total	54.029	142			

a. Dependent Variable: lnROA

b. Predictors: (Constant), lnDET, lnintcov, lnCRatio, lnDebtratio

SOURCE: RESEARCHER OUTPUT USING SPSS VERSION 25

To assess the validity of the multiple regression model, it's essential to conduct a global test that examines whether all the independent variables possess regression coefficients equal to zero. In simpler terms, this test investigates if the explained variance is not the result of randomness. The corresponding regression coefficients in the sample are denoted as β1, β2, β3, β4. The null and alternative hypotheses are stated as follows: H0: $\beta 1 = \beta 2 = \beta 3 = \beta 4 = 0$ H1: Not all β coefficients are equal to 0. To evaluate the null hypothesis, we employ an F-test that necessitates an analysis of the variance as identified in the ANOVA table above. From the data presented in the previous table (Table 11), it can be determined that the calculated F-value for the variance derived from the regression is 124.124. The critical F-value, at a significance level of 0.05, with 4 degrees of freedom in the numerator and 138 in the denominator, is 2.437. By comparing the F-values, it becomes evident that it is essential to accept the alternative hypothesis, indicating that not all regression coefficients are equal to zero. This implies a significant impact of the multiple regression model on the dependent variables. The next question that arises pertains to which regression coefficients may be zero and which may not. It is therefore necessary to individually assess the regression coefficients. An evaluation involves conducting a statistical test for each coefficient, where the null hypothesis posits that each coefficient β is equal to zero, and the alternative hypothesis tests that they differ from zero.

4.7.4 Examine Coefficients Table:

Find the "Coefficients" table in the output, which furnishes details about the contribution of each predictor to the model. Examine the "Sig." value associated with each predictor. If the p-value is below your designated significance level, typically set at 0.05, you have grounds to reject the null hypothesis. This rejection indicates that the specific predictor in question does have a statistically significant effect on the dependent variable, as opposed to having no impact**.**

TABLE 4.12 T-TEST TABLE

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95.0% Confidence Interval for B Lower Bound	95.0% Confidence Interval for B Upper Bound	Collinearity Statistics Tolerance	Collinearity Statistics VIF
1	(Constant)	.071	.032		2.230	.027	.008	.135		
	Ln Interest cov.ratio	-.003	.001	-.137	-2.882	.005	-.005	-.001	.852	1.174
	Ln DTE	-.001	.001	-.061	-.510	.611	-.003	.002	.129	7.752
	Ln Debt Ratio	-.071	.035	-.487	-2.049	.042	-.140	-.002	.320	3.125
	Ln CR	.016	.007	.368	2.268	.025	.002	.030	.71	1.408

a. Dependent Variable: Ln ROA

SOURCE: RESEARCHER OUTPUT USING SPSS VERSION 25

The test used in this analysis is the Student's t-test, denoted as "t," with degrees of freedom equal to 138. The computed t-values for the four variables of interest are as follows: -2.882 for interest ln Cov. Ratio, -0.510 for ln DTE Ratio, -2.049 for ln Current Ratio, and 2.268 for ln Debt Ratio.

To determine if the null hypothesis should be rejected, we compare the calculated t-values to the critical t-value at a significance level of 0.05 for a two-tailed test. The critical value is ±1.977.

For the Ln interest Cov. Ratio, the calculated t-value (-2.882) is less than the critical t-value (-1.977). Therefore, we reject the null hypothesis and conclude that there is a significant impact on the dependent variable.

For the Ln DTE Ratio, the calculated t-value (-0.510) is greater than the critical t-value (-1.977). Therefore, we fail to reject the null hypothesis and conclude that there is not enough evidence to suggest a significant impact on the dependent variable. This implies that β3 is zero, indicating that D/E ratio has no impact on ROA.

For the Current Ratio, the calculated t-value (-2.049) is less than the critical t-value (-1.977). Therefore, we reject the null hypothesis and conclude that there is a significant on the dependent variable. This indicates that β2 is different from zero.

For the Debt Ratio, the calculated t-value (2.268) is greater than the critical t-value (1.977). Therefore, we reject the null hypothesis and conclude that there is a significant on the dependent variable. This indicates that β1 is different from zero. Based on these results, we can conclude that the Null Hypothesis has been rejected for the Current Ratio and Debt Ratio variables.

TABLE 4.13 F-TEST TABLE

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.870[a]	.757	.752	.33043	.757	144.494	3	139	.000

a. Predictors: (Constant), lnDebtR, lnint.cov, lnCR

b. Dependent Variable: lnROA

SOURCE: RESEARCHER OUTPUT USING SPSS VERSION 25

Adjusted R^2: The Adjusted R^2 value of 75.2% indicates that the model, including Ln (Interest Coverage Ratio), and Ln (Debt Ratio), explains 72.6% of the variability in ROA. A higher Adjusted R^2 suggests a better fit of the model. Degrees of Freedom (df1=3, df2=139): These values are associated with the F-statistic and are important for hypothesis testing regarding the overall significance of the model. In this case, df1=3 represents the degrees of freedom associated with the numerator, and df2=139 represents the degrees of freedom associated with the denominator.

In summary, this model suggests that the specified independent variables have a statistically significant impact on ROA, and the model, as a whole, explains a substantial proportion of the variability in ROA.

TABLE 4.14 ANOVA TABLE

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	47.329	3	15.776	144.494	.000[b]
	Residual	15.177	139	.109		
	Total	62.506	142			

a. Dependent Variable: lnROA

b. Predictors: (Constant), lnDebtR, lnint.cov, lnCR

SOURCE: RESEARCHER OUTPUT USING VERSION 25

Upon comparing the newly derived F values from Table 14, it has been determined that the calculated F value for the variance generated by the regression is 144.494. In comparison, the critical value of F with a significance level of 0.05, 3 degrees of freedom in the numerator, and 139 degrees of freedom in the denominator is 2.67. Based on the comparison of these F values, it is necessary to accept the alternative hypothesis, indicating that not all regression coefficients are equal to zero.

TABLE 4.15 T-TEST TABEL

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95.0% Confidence Interval for B Lower Bound	95.0% Confidence Interval for B Upper Bound	Collinearity Statistics Tolerance	Collinearity Statistics VIF
1	(Constant)	.083	.022		3.751	.000	.039	.127		
	Ln Debt Ratio	-.086	.019	-.588	-4.553	.000	-.123	-.049	.117	8.561
	Ln CR	.014	.006	.317	2.493	.014	.003	.025	.121	8.294
	Ln Interest cov.ratio	-.003	.001	-.138	-2.890	.004	-.005	-.001	.862	1.161

a. Dependent Variable: ROA

SOURCE: RESEARCH OUTPUT USING SPSS VERSION 25

The test utilized in this analysis is the Student's t-test, with n-(k+1) degrees of freedom. From the SPSS results, the calculated t values are obtained for each of the three variables, as shown in Table 16. These values are 2.493 for Ln Current Ratio and -4.553 for Ln Debt Ratio. To establish the decision rule regarding the null hypothesis, the calculated t values are compared with the critical value of t at a significance level of 0.05 for a two-tailed test, with 144-(3+1) degrees of freedom, or 140 degrees of freedom. This critical value is ±1.66. The results are as follows:

For Debt Ratio, the calculated t value (-4.553) is less than the critical t value (-1.66). The level of significance indicated by the test is 0.000, which is lower than the selected significance level of 0.05. Therefore, the null hypothesis is rejected, and it is accepted that β1 is different from zero.

For Ln Current Ratio, the calculated t value (2.493) is greater than the critical t value (1.66). The level of significance indicated by the test is 0.014, which is lower than the selected significance level of 0.05. Thus, the null hypothesis is rejected, and it is accepted that β2 is different from zero.

For Ln int.Cov Ratio, the calculated t value (-2.890) is greater than the critical t value (-1.66). The level of significance indicated by the test is 0.004, which is lower than the selected significance level of 0.05. Thus, the null hypothesis is rejected, and it is accepted that β4 is different from zero.

Therefore, the results will be:

$Y = \beta 0 + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4X4 + \varepsilon.$

$Y = \beta 0 + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4X4 + \varepsilon.$

The equation is ***Y = -0.086X1 + 0.014X2-0.003X4 + 0.083,***

Where Y represents ROA,

X1 represents Debt ratio,

X2 represents Current ratio and

X4 represents interest coverage ratio.

The Adjusted R Square value of 75.2 in relation to the formula Y = ***-0.086X1 + 0.014X2-0.003X4 + 0.083,***

Where the adjusted R square 75.2% of the variation in the dependent variable (ROA) can be explained by the independent variables (Debt ratio, Current ratio and interest coverage ratio) included in the model, while the remaining 24.8% is attributed to other factors not accounted for in the model. This value reflects the goodness of fit of the model and suggests that it is a moderately good fit for the data.

4.7.5 Interpretation the result

The statistical test results and interpretations provide valuable insights into the relationship between financial ratios and profitability, shedding light on whose ideas align and whose differ.

A. **Debt Ratio (β1):**

Interpretation: The relationship between the debt ratio and return on assets (ROA) is crucial in financial analysis, and the calculated t value for Ln Debt Ratio at -4.553, with a low p-value of 0.000, underscores its statistical significance. The negative coefficient of -4.553 implies an inverse correlation, suggesting that as the natural logarithm of the debt ratio (Ln Debt Ratio) increases, there is a corresponding decrease in ROA. The magnitude of the coefficient accentuates the strength of this relationship, emphasizing that higher debt ratios may pose challenges to a company's profitability. The low p-value enhances confidence in the reliability of this relationship, indicating it is unlikely to be a result of random chance. In practical terms, the interpretation suggests that careful financial management and risk assessment are crucial for companies with elevated levels of debt, as it could negatively impact their ability to generate sufficient earnings relative to the level of debt, thereby influencing return on assets.**Conclusion:** The null hypothesis is rejected, suggesting a significant difference from zero and a statistically significant relationship between Debt Ratio and profitability.

Implication: Researchers like Aggarwal and Kyaw (2017) and Kaur and Singh (2015), who found a negative impact of high debt ratios on profitability, align with this result. However, the positive relationship between Ln Debt Ratio and profitability (β4) contradicts this finding. Literature Finding: Studies by Al-Tamimi and Moustafa (2015) and Goyal and Joshi (2017) suggested a negative impact of a high debt ratio on profitability.

B. **Ln Current Ratio (β2):**

Interpretation: The calculated t value for Ln Current Ratio at 2.493, with a p-value of 0.014, signals statistical significance and highlights a noteworthy relationship between the natural logarithm of the current ratio (Ln Current Ratio) and return on assets (ROA). The positive t value suggests a positive association, indicating that as the natural logarithm of the current ratio increases, there may be a corresponding positive impact on ROA. The low p-value strengthens the confidence in the significance of this relationship, emphasizing that it is unlikely to have occurred by random chance. In practical terms, this finding implies that maintaining or improving the current ratio could potentially contribute positively to a company's return on assets, underscoring the importance of liquidity and efficient management of current assets and liabilities in enhancing overall financial performance.

Conclusion: The null hypothesis is rejected, suggesting a significant difference from zero and a statistically significant relationship between Ln Current Ratio and profitability.

Implication: Studies like Nasir and Hossain (2014) and Kim and Kim (2018), which found a positive relationship between higher current ratios and stronger financial performance, align with this result. However, Bhatia (2016) and Asante and Osei-Tutu (2018) found no significant relationship between liquidity and profitability.

C. Ln Interest Coverage Ratio (β4):

Interpretation: The calculated t value for Ln Interest Coverage Ratio is -2.890, with a p-value of 0.004, indicating statistical significance and pointing to a significant relationship between the natural logarithm of the interest coverage ratio (Ln Interest Coverage Ratio) and return on assets (ROA). The negative t value suggests an inverse association, indicating that as the natural logarithm of the interest coverage ratio decreases, there may be a corresponding negative impact on ROA. The low p-value enhances the confidence in the statistical significance of this relationship, emphasizing that it is unlikely to have occurred by random chance. In practical terms, this finding suggests that a lower interest coverage ratio could potentially lead to a decrease in return on assets, underscoring the importance of a company's ability to cover interest expenses in maintaining or enhancing overall financial performance. Strategic financial planning and risk management may be essential in mitigating potential adverse effects on profitability associated with lower interest coverage ratios.

Conclusion: The null hypothesis is rejected, indicating a significant difference from zero and a statistically significant relationship between Ln Interest Coverage Ratio and profitability.

Implication: Studies like Goyal and Joshi (2017) and Akindele and Olojede (2018), which found a positive influence of interest coverage ratio on profitability, align with this result.

In summary, the findings suggest that the Debt Ratio and Interest Coverage Ratio have a significant impact on profitability, aligning with the literature. However, there is a contradiction in the positive relationship between Debt Ratio and profitability. Researchers should consider these nuances when interpreting financial ratios' implications on profitability.

4.8 Determining practical significance of each independent variables

According to Smith and Johnson (2020), Eta squared (η^2) is a measure of effect size utilized in the context of Analysis of Variance (ANOVA) and similar statistical tests to determine practical significance of each predictor. It denotes the proportion of the total variance in the dependent variable explained by an independent variable. The practical significance of eta squared is evident in its interpretation, and indeed, its range is between zero and 1.Here is how to interpret eta squared in practical terms:

$\eta^2 = 0$: No effect. The independent variable(s) do not explain any of the variability in the dependent variable.

$0 < \eta^2 < 0.01$: Small effect. The independent variable(s) explain a small proportion of the variability in the dependent variable.

$0.01 \leq \eta^2 < 0.06$: Medium effect. The independent variable(s) have a moderate impact on the variability in the dependent variable.

$\eta^2 \geq 0.06$: Large effect. The independent variable(s) have a substantial impact, explaining a large proportion of the variability in the dependent variable.

Keep in mind that the practical relevance of eta squared depends on the context of the study, the field of research, and the specific research question. In some fields, even small effects may be considered practically significant, while in others, only large effects may be considered noteworthy.

When interpreting eta squared, it's also crucial to consider other factors such as the sample size, study design, and the reliability of the measurements. Additionally, researchers often complement eta squared with confidence intervals to provide a range of plausible values for the true effect size in the population.

In summary, eta squared's practical relevance lies in its ability to quantify the impact of independent variables on the dependent variable, and its interpretation can inform researchers about the substantive significance of their findings.

TABLE 4.16 CROSS PROCESSING SUMMERY FOR INTEREST COVERAGE RATIO

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
lnint.cov * lnROA	144	100%	0	0.0%	144	100.0%

Source: Research output using SPSS version 25

TABLE 4.17 PARTIAL ETA SQUARED FOR LN INTEREST COVERAGE RATIO

Tests of Between-Subjects Effects

Dependent Variable: lnROA

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	43.902[a]	80	.549	1.850	.006	.701
Intercept	190.763	1	190.763	643.187	.000	.911
lnint.cov	43.902	80	.549	1.850	.006	.701
Error	18.685	63	.297			
Total	315.241	144				
Corrected Total	62.588	143				

a. R Squared = .701 (Adjusted R Squared = .322)

Source: Research output using SPSS version 25

The case processing summary reveals a complete dataset with no missing values for the variables in the regression analysis. Notably, the effect size (eta squared) is substantial at 0.701, indicating that 70.1% of the variability in the dependent variable (ROA) can be attributed to the independent variable (interest coverage ratio), suggesting a robust relationship. The regression statistics, including an R-squared of 0.701 and an adjusted R-squared of 0.322, highlight that the model effectively explains 70.1% of the variance in ROA. While caution is advised against inferring causation solely from correlation, the results strongly suggest a significant association between the interest coverage ratio and return on assets. The high adjusted R-squared values underscore the relevance of the interest coverage ratio in explaining ROA variance, but a comprehensive understanding necessitates consideration of the study context and potential causal factors.

TABLE 4.18 CASE PROCESSING SUMMARY LN CURRENT RATIO

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
lnCR * lnROA	144	100.0%	0	0.0%	144	100.0%

TABLE 4.19 PARTIAL ETA SQUARED FOR CURRENT RATIO

Tests of Between-Subjects Effects

Dependent Variable: lnROA

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	55.676[a]	62	.898	10.525	.000	.890
Intercept	82.405	1	82.405	965.781	.000	.923
lnCR	55.676	62	.898	10.525	.000	.890
Error	6.911	81	.085			
Total	315.241	144				
Corrected Total	62.588	143				

a. R Squared = .890 (Adjusted R Squared = .805)

The case processing summary indicates a complete dataset with no missing values for the variables in the regression analysis. Remarkably, the effect size (eta squared) is substantial at 0.89, signifying that 89.1% of the variability in the dependent variable (ROA) can be attributed to the independent variable (current ratio), highlighting a robust relationship. The regression statistics further support this, revealing an R-squared of 0.89 and an adjusted R-squared of 0.805, indicating that the model effectively accounts for 89% of the variance in ROA. Caution is advised against drawing causal conclusions solely from correlation. Nevertheless, the results strongly imply a significant association between the current ratio and return on assets. The high adjusted R-squared values underscore the current ratio's substantial impact in explaining ROA variance, suggesting it has a more pronounced influence compared to the other two independent variables (Interest coverage ratio and debt ratio). A comprehensive understanding of these findings requires consideration of the study context and potential causal factors.

TABLE 4.20 CASE PROCESSING SUMMARY OF LN DEBT RATIO

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
lnDebtR * lnROA	144	100.0%	0	0.0%	144	100.0%

TABLE 4.21 PARTIAL ETA SQUARED FOR DEBT RATIO

Tests of Between-Subjects Effects

Dependent Variable: lnROA

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	53.158[a]	44	1.208	12.684	.000	.849
Intercept	68.357	1	68.357	717.682	.000	.879
lnDebtR	53.158	44	1.208	12.684	.000	.849
Error	9.429	99	.095			
Total	315.241	144				
Corrected Total	62.588	143				

a. R Squared = .849 (Adjusted R Squared = .782)

The case processing summary indicates a complete dataset with no missing values for the variables in the regression analysis. Significantly, the effect size (eta squared) is substantial at 0.849, revealing that 84.9% of the variability in the dependent variable (ROA) can be ascribed to the independent variable (debt ratio), suggesting a robust relationship. The regression statistics further support this observation, with an R-squared of 0.89 and an adjusted R-squared of 0.782, indicating that the model effectively accounts for 84.9% of the variance in ROA. While caution is warranted against inferring causation solely from correlation, the results strongly imply a noteworthy association between the debt ratio and return on assets. The high adjusted R-squared values underscore the significance of the debt ratio in explaining ROA variance, positioning it as having the second most substantial impact compared to the other independent variables. A comprehensive understanding of these findings necessitates consideration of the study context and potential causal factors.

4.9 Additional consideration

4.9.1 Confidence interval

In SPSS, checking confidence intervals for effect sizes like η^2 involves some manual calculations or additional steps, as SPSS does not provide direct options for calculating confidence intervals for effect sizes in the same way it does for means or proportions. Here is a general guide on how you might proceed:

1. **Calculate Eta Squared (η^2):**
   - Run your analysis (ANOVA) in SPSS to obtain the Eta Squared value.
2. **Calculate Standard Error (SE) of Eta Squared:**
   - The formula for calculating the standard error of η^2 is:

$$SE(\eta 2) = sq.root \frac{2 \cdot (1 - \eta 2)}{N}$$

   - Sample size (N=144) and the Eta Squared value from our SPSS analysis.

3. **Determine the Confidence Interval (CI):**

- Once you have the SE, you can calculate the confidence interval using the formula:

$$CI = \eta 2 \pm (Critical\ Value \times SE(\eta 2))$$

- The critical value depends on the desired confidence level for a 95% confidence interval, the critical value is approximately 1.96.

TABLE 4.22 CONFIDENCE INTERVAL

Predictors	**Eta Squared (η^2)** ANOVA) in SPSS	**Standard Error (SE) η^2** SE(η2)=sq. Root (2·(1-η2))/N	**Confidence Interval (CI)** CI=η2±(Critical Value× SE(η2))
Current ratio	0.890	0.054	0.78416 to 0.99584
Debt ratio	0.849	0.062	0.72748 to 0.97052
Int. coverage ratio	0.701	0.084	0.53636 to 0.86564

A. **Interpretation CI for current ratio**

Effect Size (η^2):

The effect size (η^2) is 0.89. This indicates a large effect size, as η^2 ranges from 0 to 1. In practical terms, a value of 0.89 suggests that a substantial proportion (89%) of the variance in the dependent variable is explained by the Current Ratio.

Standard Error (SE) of η^2:

The standard error (SE) is 0.054. This represents the variability or precision of the estimate. A smaller SE indicates a more precise estimate.

Confidence Interval (CI):

The Confidence Interval is given as 0.78416 to 0.99584. Given that this interval does not include zero and is entirely positive, it suggests that the effect size is statistically significant at the 95% confidence level.

Interpretation with Critical Value (1.96):

Since the Confidence Interval is entirely positive and does not include zero, and considering the standard critical value of approximately 1.96 for a 95% confidence interval, you can conclude that the effect size is statistically significant. The Confidence Interval (0.78416 to 0.99584) provides a range within which you can be 95% confident that the true population effect size lies.

Practical Significance:

An effect size of 0.89 is large, suggesting a substantial impact of the Current Ratio on the dependent variable. This is not only statistically significant but also practically significant.

In summary, for the Current Ratio predictor variable, a η^2 of 0.89, with a small standard error and a 95% confidence interval (0.78416 to 0.99584) that does not include zero, indicates a statistically and practically significant impact on the dependent variable. The confidence interval provides a range within which you can be reasonably confident about the true effect size.

B. Interpretation CI for debt ratio

Effect Size (η^2):

The effect size (η^2) is 0.849. This indicates a large effect size, as η^2 ranges from 0 to 1. A value of 0.849 suggests that the Debt Ratio explains a substantial proportion (84.9%) of the variance in the dependent variable.

Standard Error (SE) of η^2:

The standard error (SE) is 0.062. This represents the variability or precision of the estimate. A smaller SE indicates a more precise estimate.

Confidence Interval (CI):

The Confidence Interval is given as 0.72748 to 0.97052. Given that this interval does not include zero and is entirely positive, it suggests that the effect size is statistically significant at the 95% confidence level.

Interpretation with Critical Value (1.96):

Since the Confidence Interval is entirely positive and does not include zero, and considering the standard critical value of approximately 1.96 for a 95% confidence interval, we can conclude that the effect size is statistically significant. The Confidence Interval (0.72748 to 0.97052) provides a range within which you can be 95% confident that the true population effect size lies.

Practical Significance:

An effect size of 0.849 is large, suggesting a substantial impact of the Debt Ratio on the dependent variable. This is not only statistically significant but also practically significant.

In summary, for the Debt Ratio predictor variable, a η^2 of 0.849, with a small standard error and a 95% confidence interval (0.72748 to 0.97052) that does not include zero, indicates a statistically and practically significant impact on the dependent variable. The confidence interval provides a range within which you can be reasonably confident about the true effect size.

C. Interpretation CI for debt ratio

Effect Size (η^2):

The effect size (η^2) is 0.701. This suggests a moderately large effect size, as η^2 ranges from 0 to 1. A value of 0.701 indicates that the Interest Coverage Ratio explains a substantial proportion (70.1%) of the variance in the dependent variable.

Standard Error (SE) of η^2:

The standard error (SE) is 0.084. This represents the variability or precision of the estimate. A smaller SE indicates a more precise estimate.

Confidence Interval (CI):

The Confidence Interval is given as 0.53636 to 0.86564. Since this interval does not include zero and is entirely positive, it suggests that the effect size is statistically significant at the 95% confidence level.

Interpretation with Critical Value (1.96):

Given the standard critical value of approximately 1.96 for a 95% confidence interval, and considering that the Confidence Interval (0.53636 to 0.86564) does not include zero, you can conclude that the effect size is statistically significant. The Confidence Interval provides a range within which you can be 95% confident that the true population effect size lies.

Practical Significance:

An effect size of 0.701 is moderately large, suggesting a significant impact of the Interest Coverage Ratio on the dependent variable. This is both statistically and practically significant.

In summary, for the Interest Coverage Ratio predictor variable, an η^2 of 0.701, with a moderate standard error and a 95% confidence interval (0.53636 to 0.86564) that does not include zero, indicates a statistically and practically significant impact on the dependent variable. The confidence interval provides a range within which you can be reasonably confident about the true effect size.

CHAPTER FIVE

5. SUMMARY, CONCLUSION AND RECOMMENDATION

This chapter presents conclusions that conform to the research objectives stated in the introduction part. Recommendations will also be forwarded to improve the performance of Ethiopian Privet banks for the successful achievement of its industry, to point out amendments if there is any to come out from the research and highlighting topics for future study.

5.1 Summery of the finding

It can be concluded that the current ratio, debt ratio, debt to equity ratio, and interest coverage ratio have varying impacts on the profitability of banks.

- The analysis of the current ratio indicates that all banks have a satisfactory level of liquidity to meet their short-term obligations. However, it is important to consider that a high current ratio does not always result in increased profitability. In fact, there is a positive relationship between the current ratio and ROA, suggesting that a higher current ratio can lead to improved profitability. Nevertheless, it is important to note that having excessive current assets may not always be the most efficient use of resources. Banks need to find a balance between maintaining sufficient liquidity and maximizing profitability.
- Most Ethiopian private banks generally align with the industry average for the debt ratio, typically hovering around 0.5. The prevalent negative correlation observed between the debt ratio and Return on Assets (ROA) among the majority of banks suggests that elevated debt levels tend to adversely affect profitability. This conclusion is further reinforced by the predictive model, highlighting the substantial influence of the debt ratio on profitability as

measured by ROA. Hence, it is crucial for banks to prudently handle their debt levels, striking a balance that ensures optimal profitability while mitigating the risk of financial challenges. Majority of private banks in Ethiopia currently exhibit a favorable interest coverage ratio, indicating potential financial stability amidst potential declines in financial performance. It is crucial to recognize that the interest coverage ratio, a key metric assessing a company's capacity to meet debt interest expenses, significantly influences the profit prediction model. Nevertheless, the observed negative correlation between the interest coverage ratio and Return on Assets (ROA) implies that banks with higher interest coverage ratios are not likely to encounter difficulties in generating increased profits, mitigating potential financial challenges.

- The model, comprising independent variables such as Debt ratio, Current ratio, and Interest coverage ratio, demonstrates a commendable explanatory power for the dependent variable, Return on Assets (ROA). The adjusted R-squared value of 75.2% signifies that a substantial portion of the variation in ROA is accounted for by the included independent variables. The remaining 24.8% of variation is attributed to factors not considered in the model. This reflects the goodness of fit of the model, indicating that it provides a moderately strong representation of the data. Overall, the model is deemed effective in explaining and predicting variations in ROA, although there is acknowledgment that other factors outside the model may also influence the dependent variable.
- The impact of the independent variables current ratio, debt ratio, and interest coverage ratio on the dependent variable, Return on Assets (ROA), evident both statistically and practically. The substantial effect sizes, measured by Eta square, further emphasize the significance of these predictors. Specifically, the effect sizes are remarkably high, with Eta square values of 0.89 for current ratio, 0.849 for debt ratio, and 0.701 for interest coverage ratio. These values signify that a substantial proportion of the variability in ROA can be attributed to each respective

independent variable. Such pronounced effect sizes reinforce the practical significance of these financial metrics in explaining and influencing the observed variations in ROA.

5.2 Conclusion

In conclusion, the analysis of key financial ratios reveals that the current ratio, debt ratio, debt to equity ratio, and interest coverage ratio exert varying influences on the profitability of banks. While a high current ratio indicates sufficient liquidity for short-term obligations and a positive correlation with improved profitability, the challenge lies in striking a balance to avoid inefficient resource utilization. Elevated debt levels, as reflected in the debt ratio, generally negatively impact profitability, emphasizing the importance of prudent debt management for optimal financial health. The interest coverage ratio, indicating financial stability, contributes significantly to the profit prediction model, though a negative correlation with Return on Assets (ROA) suggests that higher interest coverage does not always guarantee increased profits. The model, with a commendable explanatory power of 75.2%, effectively captures variations in ROA, acknowledging that 24.8% of the variability may be influenced by factors beyond the model's scope. Notably, the practical significance of independent variables is underscored by substantial effect sizes, emphasizing their considerable impact on explaining variations in ROA.

5.3 Recommendations

Based on the findings of the study, the following recommendations are suggested for banks to improve their profitability:

1. Banks are advised to adopt a comprehensive financial strategy by maintaining a satisfactory level of liquidity, striking a balance between liquidity and profitability based on the analysis of the current ratio. Additionally, aiming for debt ratios 0.5 is recommended to optimize

profitability without exposing the institution to financial difficulties. Furthermore, while a favorable interest coverage ratio signifies financial stability, banks should exercise caution, managing it judiciously to prevent hindrances to profit generation and potential financial challenges

2. Apply the developed model with Debt ratio, Current ratio, and Interest coverage ratio to gain valuable insights into Return on Assets (ROA). The robust adjusted R-squared value of 75.2% indicates a strong explanatory power, making the model effective for understanding and predicting ROA variations.

3. Prioritize attention to the substantial effect sizes (Eta square values of 0.89, 0.849, and 0.701) for current ratio, debt ratio, and interest coverage ratio. Recognize these financial metrics as significant influencers of ROA, reinforcing their practical importance in explaining and influencing observed variations in ROA.

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