Article

Effect of Capital Structure on the Financial Performance of Ethiopian Commercial Banks

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Abstract: This study aimed to examine the effects of capital structure on the financial performance of Ethiopian commercial banks. The dependent variable, financial performance, is measured by Return on Assets (ROA), while factors such as loan-to-deposit ratio (LDR), asset-to-total equity ratio (ATER), total deposit-to-total asset ratio (TDTAR), capital adequacy ratio (CAD), and asset growth ratio (GA) were used as proxy independent variables to gauge capital structure. Using a quantitative approach and an explanatory research design, this study analyzes 6 years of audited financial reports from 14 commercial banks in Ethiopia. This investigation employs a random effect regression model and Stata 14 software package to explore the relationships among these variables. The result revealed that both the loan-to-deposit ratio and the total deposit-to-total asset ratio have a positive and significant impact on financial performance, while the asset growth ratio showed a negative effect. Based on these findings, this study recommends that bank authorities concentrate on bolstering their deposit base, managing asset growth efficiently, maintaining adequate capital levels, and optimizing leverage levels to improve financial performance and ensure long-term sustainability in the banking sector. Additionally, this research is anticipated to inform policymakers about regulatory frameworks for banks and assist banking managers in formulating effective capital financing strategies within the Ethiopian commercial banking sector, thus enriching the existing literature on the relationship between capital structure and financial performance.

Keywords: financial performance; capital structure; commercial banks

1. Introduction

Capital structure, which involves finding the right combination of debt and equity, is crucial for businesses, as it significantly affects performance and long-term viability (Boshnak 2023; Makarla and Degefa 2019). Choosing the right capital financing and measuring financial performance are two of the most important responsibilities of finance managers (Mathur et al. 2023). However, the question of what makes for an optimal structure of the firm's capital is a contentious issue in corporate finance (Panda and Nanda 2020; Assfaw 2020). Scholars and professionals have different views on how capital structure affects organizations' financial performance. The disagreement began with Modigliani and Miller's study in 1958, where they first advocated that financial structure does not affect corporate value under perfectly competitive markets (Mazanec 2023). However, their later work in 1963 indicated that growing debt levels could improve a company's value, suggesting that an ideal capital structure might be primarily or wholly composed of debt (Hundal et al. 2020). Hence, the field of finance emphasize the importance of recognizing these

aspects and underscores the need for sufficient capital to guarantee operational efficiency (Xu et al. 2021).

Given its importance to the global economies, the banking industry places a premium on determining the optimal capital structure (Berhe 2019). The financial policy that banks choose greatly impacts their ability to meet shareholder expectations (Pervin and Nowreen 2018; Chechet and Olayiwola 2014). When banks wisely choose their financial structure, they may take advantage of growth possibilities, thrive, and distribute earnings to shareholders fairly (Ajayi et al. 2019). Conversely, when banks have inadequate capital combinations, they either fail or function poorly, which, in turn, causes economic slowdowns (Ongore and Kusa 2013).

Developing nations' banking businesses are particularly vulnerable to capital structure decisions because of their low equity-to-total asset ratios and stringent regulations (Sivalingam and Kengatharan 2018). Ethiopia's banking industry is crucial for the nation's economy, contributing more than 4.2% to the GDP and representing over 95% of the capital (Muhammed et al. 2023; Tekatel 2019; Abate and Kaur 2023). Any disruption or failure in this sector would greatly impact the country's overall economic development. Furthermore, the Ethiopian private banking sector faces significant challenges, including a limited selection of financial services, costly branch expansions, technological deficiencies, a significant reliance on manual processes, and a notable concentration on urban markets (Tekatel 2019). As a result, placing complete reliance on traditional models to maintain competitiveness in a highly competitive industry is insufficient. Given the gravity of this issue, it is imperative to ascertain the factors that influence financial performance, as this contributes to the sustained prosperity of an organization. Hence, the purpose of this study is to investigate the correlation between the capital structure and the performance of private commercial banks in Ethiopia. Anticipatedly, the findings of this research will yield substantial insights that can support financial institutions in adapting to the perpetually evolving business landscape, thereby ensuring their sustained prosperity as organizations. In addition, by enlightening policymakers about regulatory frameworks for banks and assisting banking managers in the development of efficient capital financing strategies in the Ethiopian commercial banking sector, this research is anticipated to contribute to the body of knowledge concerning the correlation between capital structure and financial performance.

Numerous empirical studies have yielded inconsistent results. A positive association between capital structure and firm performance was found by Abdullah and Tursoy (2021) in Germany and Adesina et al. (2015) in Nigeria. While empirical research conducted in Vietnam by Nguyen (2020), in Indonesia by Ramli et al. (2019), and in Malaysia by Le and Phan (2017) has provided evidence of negative connections. This highlights the significance of considering country-specific studies. In Ethiopia, the following studies have been conducted by Teshome et al. (2018), Kibrom (2010), Berhe (2019), Adato (2022), Bezabeh and Desta (2014), Assfaw (2020), Birru (2016), Makarla and Degefa (2019), and Gofe and Asfaw (2023). However, none of the aforementioned studies takes into account bank-specific factors, such as the ratio of total deposit-to-total asset and the total asset to equity. Furthermore, certain research initiatives yield conflicting outcomes. Generally, the presence of contradicting outcomes reported on a global scale, as well as within the context of Ethiopia, along with the exclusion of crucial bank-specific factors in previous studies, highlights the necessity for further inquiry. This study aims to fill these existing gaps by examining the influence of several components of capital structure, such as loan-to-deposit, asset-to-total equity, total deposit-to-total asset, capital adequacy, and asset growth ratios, on the financial performance of commercial banks in Ethiopia. The projected results possess the capacity to enhance decision-making within the banking industry.

2. Review of Literature

According to Sike et al. (2022) and Mohammad and Bujang (2020), the concept of "capital structure" pertains to the composition of debt and equity employed by a company to fund its activities. Several theories have been established to comprehend the correlation

between capital structure choices and the value of a company. The Modigliani–Miller (MM) theory, which was first proposed in 1958, posited that in a market characterized by perfect competition, the valuation of a corporation is not influenced by its capital structure (Dabi et al. 2023). Nevertheless, the revisions put out by (Modigliani and Miller 1963) recognized the potential of debt to enhance value and advocated for predominantly using debt-based financing. Alternative viewpoints on the equilibrium between the advantages and disadvantages of debt financing are provided by additional theories, such as the static trade-off theory and the Pecking Order theory (Segun et al. 2021). Moreover, the theory of agency costs provides insight into the impact of managerial incentives on decisions regarding capital structure, with a particular focus on the significance of debt in aligning management goals with the value of shareholders (Rajamani 2021). Nevertheless, it is imperative to acknowledge that an abundance of debt can intensify agency issues, presenting potential hazards to the long-term investments of shareholders (Ahmed et al. 2023b). Therefore, it is crucial to have efficient management to attain a harmonious balance between the benefits of debt, management motivations, and shareholder worth. It is crucial to acknowledge that although these theories offer significant perspectives, the ideal capital structure may differ based on the particular circumstances and goals of each company. These theories jointly propose that the financial performance of a corporation is substantially impacted by its decisions about capital structure.

Numerous empirical studies have reported a substantial relationship between capital structure and financial performance. According to Xu et al. (2021), their study investigated the correlation between debt ratios and financial performance in China's agricultural industry. The study's results revealed the adverse effects of short-term debt on economic profitability. Abdullah and Tursoy (2021) conducted a study to analyze the financial environment in Germany following the adoption of International Financial Reporting Standards (IFRS). It was found that non-financial entities exhibited a significant reliance on debt financing, thereby highlighting the pervasive influence of capital structure on financial performance. The correlation between capital composition, ownership structures, and financial performance in Latin American corporations was further investigated by Gallegos Mardones and Cuneo (2020). The study conducted by Ahmed and Bhuyan (2020) examined the relationship between capital structure and firm performance within the Australian service sector. The findings revealed that long-term debt is the predominant form of debt utilized by service sector companies. However, a study conducted by Rajamani (2021) in India, Nguyen and Nguyen (2020) in Vietnam, and Ahmed et al. (2023a) in Iran have revealed the adverse impact of debt on the financial performance of these countries. The heterogeneous effects of capital structure on profitability have been demonstrated in studies conducted by Anozie et al. (2023) on Nigerian oil and gas companies and Boshnak (2023) on Saudi Arabian companies.

Numerous academic inquiries have been conducted in Ethiopia to elucidate the factors that influence financial performance. In their comprehensive study, Teshome et al. (2018) conducted a thorough analysis spanning the years 2007 to 2016. The researchers examined various factors, such as operational cost efficiency, non-performing loans, credit interest income, leverage, and credit loss provision. The researchers demonstrated a positive correlation between the size of the bank and the capital adequacy ratio and credit interest income. Conversely, other variables displayed a negative correlation. Shibru (2012) conducted a comprehensive examination of the determinants that impacted the capital structure of eight commercial banks in Ethiopia during the period from 2000 to 2011. The research focused on the dimensions of size, tangibility, liquidity, and profitability. Makarla and Degefa (2019) employed a fixed-effect regression model to examine the factors influencing the capital structure of commercial banks in Ethiopia from 2006 to 2015. In addition, researchers Assfaw (2020), Adato (2022), Birru (2016), and Berhe (2019) have made significant contributions to the field by examining the impact of various factors, including earnings volatility, bank size, taxes, profitability, asset tangibility, and leverage, on the capital structure of private banks in Ethiopia. Despite the vast amount of research focused on this subject, there

are still inconsistencies present in the current literature. To provide an example, Adato (2022) observed a positive association between the loan-to-deposit ratio and banking performance, while Birru (2016) observed a negative correlation. Through this finding, Kibrom (2010) identified a positive association between the increase in assets and the Return on Assets, while Shibru (2012) concluded that there is no observable impact of asset growth.

Despite the existence of numerous scholarly investigations on the impact of capital structure on firms' performance on a global scale, it is important to acknowledge that previous studies in this field have certain limitations. Firstly, these studies frequently yield contradictory findings; even though the inconsistencies may arise due to variations in sample size, methodology, or the specific context being studied, it still suggests the need for additional research. Furthermore, numerous current studies concentrate exclusively on particular factors that influence capital structure, disregarding the wider dynamics occurring within the banking industry. This research seeks to gain a comprehensive understanding of the correlation between capital structure and financial performance in Ethiopia's commercial banking sector by analyzing variables such as the loan-to-deposit ratio, total deposit-to-total asset ratio, total asset-to-total equity ratio, capital adequacy, and asset growth ratios. Furthermore, this study expands on prior research by specifically examining the Ethiopian context, thus enhancing our comprehension of capital structure dynamics in developing economies.

After a thorough review of the literature, the following hypotheses were proposed:

H1: *The loan-to-deposit ratio positively and significantly influences financial performance.*

The loan-to-deposit (LTD) ratio indicates the proportion of a bank's deposits that are being utilized to extend loans to borrowers, demonstrating the balance between deposit attraction and lending capability, which are important revenue streams for most banks (Suroso 2022). A well-managed LTD ratio provides enough liquidity to meet deposit withdrawals while also earning profits from lending activities. Despite conflicting conclusions, previous studies such as Birru (2016), Abera (2020), Fathina (2022), and Ayalew (2021) used this ratio as a key proxy for assessing capital structure. Hence, based on the idea that a higher loan-to-deposit ratio leads to more interest income and better financial performance, this study predicted a positive relationship between the LTD ratio and banks' business performance, as shown by their Return on Assets (ROA).

H2: *The deposit-to-asset ratio positively and significantly influences financial performance.*

The deposit-to-asset ratio (TDTA) measures the extent to which a bank depends on customer deposits to fund its assets (Ahmed and Teru 2020). Banks experience advantages when their total deposits-to-total assets (TDTA) ratios increase since it allows them to improve stability and liquidity (Dinh and Pham 2020). This ratio highlights the significance of using deposits as a source of funding and how it affects decisions regarding profitability. Thus, this study hypothesizes that an increase in the TDTA ratio positively affects Return on Assets. This ratio represents a novel approach that has not been previously explored by researchers.

H3: *The capital adequacy ratio has a positive and significant impact on financial performance.*

The capital adequacy ratio represents a bank's ability to cover risks and meet regulatory requirements (Sukmadewi 2020). This ratio measures the sufficiency of a bank's capital relative to its risk-weighted assets, providing valuable insights into its ability to withstand potential losses and maintain solvency (Sari and Sulistyo 2018). Prior studies (Fathina 2022; Siltan 2022; Alnajjar and Othman 2021) have used the capital adequacy ratio as a proxy for assessing capital structure. Hence, this study also suggests that there is a positive relationship between the capital adequacy ratio (CAR), which measures a bank's capital structure, and its financial performance. It is assumed that banks with sufficient

capitalization are expected to perform better than average, leading to improved financial performance, as shown by their Return on Assets (ROA).

H4: *The asset-to-equity ratio has a negative and significant influence on financial performance.*

The asset-to-total equity ratio indicates the percentage of a company's total assets that are funded by equity (Oriskóová and Pakšiová 2018). The corporation relies more on debt than equity with a higher ATER. The stakes are higher if the company fails to pay its loan obligations, which could increase macroeconomic instability and corporate insolvency (Calomiris 2013). Thus, this analysis suggests that a high asset-to-equity ratio hurts financial success. This study uses the inverse ATER to examine the counteractive effect, unlike prior studies that used equity-to-asset ratios. While both ratios illuminate a company's capital structure and financial risk, the asset-to-equity ratio highlights leverage, while the equity-to-asset ratio focuses on equity financing (Calomiris 2013). This study examines the ATER to better understand leverage, equity financing, and financial performance, expanding the field's scholarship.

H5: *Asset growth ratio has a positive and significant influence on financial performance.*

The asset growth ratio shows the rate at which a company's assets have increased over a specific period (Kibrom 2010). Capital structure debates over company expansion hinge on this dynamic. Harris and Raviv (1991) and Titman and Wessels (1988) suggest a positive correlation between firm growth and capital structure, but the trade-off theory suggests that growth opportunities signal firm success by strengthening resilience against financial distress and creating financial market access (Anarfo 2015). Prior studies by Taddese (2021), Shibru (2012), Kebede (2011), and Anarfo (2015) used the Asset Growth Ratio Ratio as the proxy to assess the capital structure. Studies have shown a favorable impact of asset expansion on profitability (Hestinoviana and Handayani 2013; Kibrom 2010). Similar to these findings, this study hypothesizes a favorable relationship between asset growth and financial performance. Figure 1 depicts the conceptual framework of the investigation.
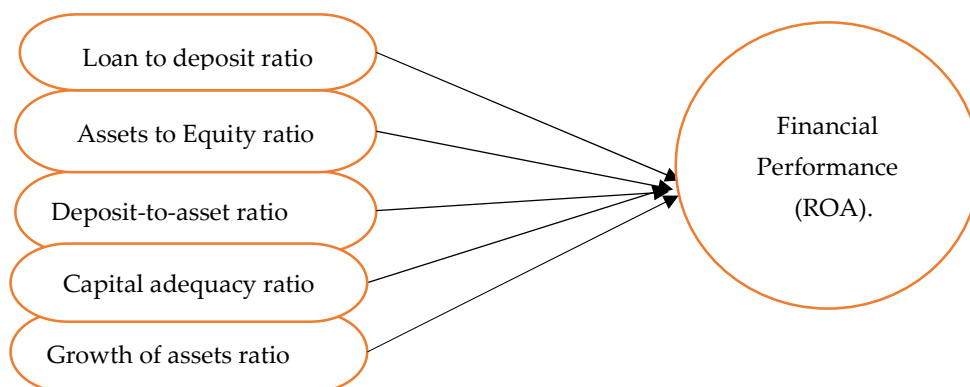

Figure 1. This study's conceptual framework (Source: constructed by the researchers).

3. Materials and Methods

This study aimed to explore the connection between capital structure (which is represented by independent variables like the ratio of loan-to-deposit, capital adequacy, total deposit-to-total asset, and asset-to-total equity) and financial performance, which is represented by Return on Assets (ROA). To achieve this objective, quantitative research approaches and an explanatory research design were used utilizing a random-effect regression model conducted through Stata 14 software. According to (Muhammed et al. (2023), Ethiopia is home to 29 commercial banks, with 27 being predominantly privately owned. Hence, given the lion's share of private banks in the nation's financial sector, and the recommendations of previous studies by Teshome et al. (2018), Tekatel (2019),

and Xu et al. (2021) that highlighted the significant impact of capital structure choices on the financial performance of privately owned banks, this study exclusively focused on private banks. Therefore, based on their extensive experience in the business and the availability of comprehensive financial data, 14 private commercial banks each equipped with comprehensive audited financial reports spanning the year from 2017 to 2022 were deliberately chosen as data sources. The selected period was intentionally coordinated to capture recent financial data and provide nuanced insights into the contemporary financial performance of Ethiopian financial institutions. In light of the Hausman test outcome and consistent with prior research utilizing similar panel data, the random effect model was selected for this investigation. Table 1 summarizes the variables used in the study and their proxies.

Table 1. Measurement of variables and their proxies.

Category	Variable	Measurement	Sources
Dependent	Financial performance (ROA)	ROA = profit after tax/total Asset*100	(Olusola et al. 2022; Anozie et al. 2023; Mohammad and Bujang 2020; Sdiq and Abdullah 2022; Ahmed et al. (2023a)
Independent Variables	Loan-to-deposit ratio (LDR)	LDR = loans and advances/total deposits*100	(Birru 2016; Abera 2020; Ayalew 2021; Sari and Sulistyo 2018)
	Deposit-to-asset ratio (DTAR)	DTAR = total deposit/Total asset*100	(National Bank of Ethiopia 2023)
	Capital adequacy ratio (CAR)	CAR = Tier 1 Capital + Tier 2 Capital/risk-weighted assets	(Siltan 2022; Alnajjar and Othman 2021; Fathina 2022)
	Asset-to-equity ratio (ATER)	ATER = asset/total equity	(Calomiris 2013; National Bank of Ethiopia 2023)
	Growth-of-assets ratio (GA)	GA = $(\text{Assets}_t - \text{Assets}_{t-1})/\text{Assets}_{t-1}*100$	(Taddese 2021; Shibru 2012; Kebede 2011; Nugroho 2018; Anarfo 2015)

Model Specification

Given that banks' financial performance is measured using Return on Assets (ROA), the model is formulated as follows:

$$\text{ROA} = \beta_0 + \beta_1\text{LDR} + \beta_2\text{ATER} + \beta_3\text{TDTAR} + \beta_4\text{CAR} + \beta_5\text{GA} + \varepsilon$$

where: ROA (Return on Assets), LDR (loan-to-deposit ratio), ATER (asset-to-equity ratio), DTAR (total deposit-to-total assets ratio), CAR (capital adequacy ratio), and GA growth of Assets).

β_0 represents intercept;
β_1 to β_5 represent coefficients;
ε is an error component that accounts for any unexplained fluctuation in the model.

4. Result and Discussion

4.1. Descriptive Statistics

In total, 84 observations were collected from the selected private commercial banks' reports for six years from 2017 to 2022. The dataset calculated the average, standard deviation, highest, and lowest values for both dependent and independent variables. Table 2 displays the descriptive statistics of the study.

Table 2. Summary of descriptive statistics.

Variable	Obsv.	Mean	St. Deviation	Minimum	Maximum
ROA	84	0.025	0.003	0.017	0.032
LDR	84	0.556	0.102	0.376	0.761
ATER	84	6.740	2.146	1.250	8.725
TDAR	84	0.483	0.160	0.005	0.850
CAR	84	0.104	0.041	0.013	0.200
GA	84	1.690	1.730	1.500	9.390

The ROA for chosen private banks in Ethiopia is 2.5% on average. Banks with a greater Return on Assets (ROA) of 3.26% are more lucrative compared to those with a lower ROA of 1.72%, possibly due to different levels of operational efficiency and profitability. On average, the loan-to-deposit ratio (LDR) is 56%, indicating the percentage of loans that are financed by customer deposits. Differences in LDR among banks, with a standard deviation of 10.2%, indicate variations in lending practices and deposit mobilization tactics. Ethiopian banks have a high asset-to-total equity ratio (ATER), which has the highest mean value of 6.74, showing a tendency to favor asset financing over equity financing. Banks exhibit differences in loan-to-deposit ratios (LDR) with a standard deviation of 10.2%, reflecting disparities in lending policies and deposit mobilization strategies. The capital adequacy ratio (CAR) is currently 10.4%, indicating growth over six years. A higher capital adequacy ratio (CAR) signifies better capital strength and adherence to regulations, which increases a bank's ability to withstand losses. The average asset growth is 1.69%, with values ranging from 150% to 939%. Differences in asset growth rates are indicative of varying business strategies and risk tolerance levels among banks.

4.2. Correlation Analysis

Correlation coefficients, which have a range of −1 to +1, signify highly significant or flawless linear associations among variables, and no linear relationship is indicated by a coefficient of 0 (Lee Rodgers and Nicewander 1988).

From Table 3, we can see that ROA is positively correlated with loan-to-deposit, asset-to-total-equity, and total-deposit–total-asset ratios, and negatively correlated with capital adequacy and asset growth.

Table 3. Correlation analysis of the selected variables.

	ROA	**LDR**	**ATER**	**TDTAR**	**CAR**	**GA**
ROA	1.000					
LDR	0.738	1.000				
ATER	0.009	0.163	1.000			
TDTAR	0.798	0.162	−0.004	1.000		
CAR	−0.027	0.047	0.711	−0.037	1.000	
GA	−0.125	0.187	0.369	0.008	0.260	1.000

4.3. Classical Linear Regression Model (CLRM) Assumptions

This study computed classical linear regression model (CLRM) assumptions to enhance the validity and reliability of the research findings and elevate the quality of the study. The subsequent sections detail the test results.

4.3.1. Heteroscedasticity Test

This study employed the Breusch–Pagan/Cook–Weisberg test to identify heteroscedasticity issues in a classical linear regression model. A substantial *p*-value at a 95% confidence,

indicates evidence of heteroscedasticity. The *p*-value for assessing uneven variance of disturbance terms is 16.32%, indicating non-significance. This shows insufficient evidence to reject the null hypothesis of equal variance of disturbance terms. Thus, the premise of homoscedasticity is confirmed, and there is no sign of heteroscedasticity in this study. Table 4 shows the test for heteroskedasticity.

Table 4. Breusch–Pagan/Cook–Weisberg test for heteroskedasticity.

Variables: Fitted Values of ROA	
$Chi^2(1)$	=1.94
Prob > chi^2	=0.1632

4.3.2. Normality Test

Wooldridge (2013) states that this test is designed to assess if the unobserved error conforms to a normal distribution throughout the population. The researchers utilized the asymptotically normally distributed skewness kurtosis test in their study. If the null hypothesis is not rejected at a 5% significance level, it indicates that the observed data do not statistically differ from normality. Given that the *p*-value of the residual is not significantly below 0.05, the researchers can conclude that the residuals are normally distributed. Table 5 illustrates the test result for the normality assumption.

Table 5. Skewness and Kurtosis tests for normality in the residuals.

Variables	Observation	Pr (Skewness)	Pr (Kurtosis)	Adj Chi^2	Prob > Chi^2
Residuals	84	0.8965	0.0211	5.22	0.0735

4.3.3. Test for Multicollinearity

One tool for evaluating multicollinearity is the Variance Inflation Factor, or VIF, and it assumes that each variable's estimated values should be less than ten, with 1/VIF above 0.1 (Williams et al. 2019). The VIF for the variables is shown in Table 6 below.

Table 6. Variable inflation factor.

Variable	Variable Inflation Factor (VIF)	1/VIF
LDR	1.76	0.568470
ATER	2.24	0.446067
TDTAR	1.67	0.599961
CAR	2.04	0.489580
GA	1.19	0.839193

Since all variables' Variance Inflation Factors are less than 10, the reciprocal of VIF can approach 0.1. This study demonstrates no problem of multicollinearity.

4.3.4. Hausman Test to Select between Fixed and Random Effect Models

A statistical technique called the Hausman test can be used to assess which model's assumptions—fixed effects or random effects—are better suited for a particular dataset. It assesses whether there is a statistically significant difference between the coefficients calculated by the two models. The Hausman Test is represented in Table 7 below.

Table 7. Hausman test.

Coefficients	Fixed Effect (b)	Random Effect (B)	(b-B)	Sqrt (dig(V-b-B))
LDR	0.015	0.015	-3.820×10^{-6}	0.0001
ATER	-0.000	-7.800×10^{-6}	-9.470×10^{-6}	0.000
TDTAR	0.011	0.011	0.0000751	0.000366
CAR	0.003	0.003	0.000914	0.001931
GA	-0.000	-0.000	4.770×10^{-12}	0.000000000375

Ho: difference in coefficients, not systematic, chi2(4) 0.34, Prob > chi2 0.9873.

4.4. Random Effect Model Estimates Result

The results of the regression analysis obtained from the analysis of the random effect model are displayed in the Table 8 below. The performance of Ethiopian commercial banks is examined in relation to capital structure in this analysis.

Table 8. Random effect regression result.

ROA	Coef.	Robust Std. Err.	Z	P > Z	95% Conf.	Interval
LDR	0.015	0.002	6.47	0.000 **	0.010	0.019
ATER	-7.801	0.000	-0.11	0.914	-0.000	0.000
TDTAR	0.011	0.002	6.58	0.000 **	0.007	0.014
CAR	0.003	0.003	0.98	0.325	-0.003	0.008
GA	-4.181	9.331	-4.48	0.000 **	-6.011	-2.351
-cons	1.236	0.094	13.14	0.000	1.052	1.421
Sigma_u	0.001	0.163	0.001			

Std. Err. adjusted for 6 clusters in the year. ** represent significance level at 5%.

No of observations: 84,

R^2: 0.779 Adjusted R^2: 0.778 Wald chi^2 = 273.92, Prob > chi^2 = 0.0000

$$ROA = \beta_0 + \beta_1 LDR + \beta_2 ATER + \beta_3 TDTAR + \beta_4 CAR + \beta_5 GA + \varepsilon$$

$$ROA = 1.236 + 0.015 LDR - 7.801 ATER + 0.011 TDTAR + 0.003 CAR - 4.181 GA + \varepsilon$$

4.5. Discussions of the Results

The adjusted R-square value of 0.7784 shows that the independent variable(s) values can explain 77.84% of these banks' Return on Assets (ROA). Keep in mind that 22.16% of the changes in ROA can be traced back to things that were not examined in this research. A total F-statistical probability measure (*p*-value) of less than 0.001 also shows that the model is accurate and fits the data well.

4.5.1. Loan-to-Deposit Ratio (LDR)

It is a quantitative metric that evaluates how much of a bank's loans it issues concerning all of its deposits. With an LDR coefficient of 0.015, it is projected that for private commercial banks in Ethiopia, each unity rise in the loan deposit ratio will lead to an approximate 0.015-unit increase in ROA, assuming no changes occur in other variables. At the 0.05 level, this value is statistically significant ($p < 0.05$), suggesting that increasing the number of loans provided through deposit financing has a positive influence on financial performance within Ethiopia's private commercial banking industry. These findings contradict previous conclusions made by Abera (2020), Birru (2016), and Suroso (2022) who found a negative and insignificant relationship between the loan-to-deposit ratio and profitability

(ROA), but align with earlier research conducted by Adato (2022) and Parvin et al. (2020). One possible explanation for this positive result could be that interest revenue generated from loans financed using deposits exceeds the interest paid out to depositors in private commercial banks in Ethiopia. This suggests that loans that are funded through deposits contribute significantly to profitability, highlighting the effectiveness of utilizing deposited funds for lending activities.

4.5.2. Asset-to-Total Equity Ratio

The coefficient for the asset-to-total equity ratio (ATER) is -7.801, but it lacks statistical significance ($p > 0.05$). This means there is no significant association between the asset-equity ratio and Return on Assets (ROA). Fluctuations in this ratio should not be considered a reliable predictor of changes in ROA. However, it still holds importance for financial structure and risk management strategies within a broader context. This study aligns with Sike et al. (2022) and Nelson and Peter (2019), who also found limited influence of ATER on ROA under certain circumstances or contexts. On the other hand, it contradicts the conclusions of Amin and Cek (2023) and Essel (2023), suggesting potential variation across different banking environments or periods regarding how much impact an asset equity ratio has on ROAs. While ATER reflects the ratio of assets financed by equity, other factors such as operational efficiency, risk management practices, market conditions, and regulatory requirements also contribute to ROA. Therefore, the lack of a significant relationship between ATER and ROA may be attributed to the dominance of these other factors in driving profitability in banking operations.

4.5.3. The Total Deposit-to-Total Asset Ratio (DTAR)

The coefficient for the deposit-to-asset ratio (DTAR) is 0.011, indicating that every unit rise in the ratio is related to an expected increase in ROA of approximately 0.01058 units, assuming all other factors remain constant. A *p*-value of less than 0.05 indicates statistical significance for this coefficient, suggesting that banking performance is strongly influenced by the deposit-to-asset ratio. This finding implies that having a higher percentage of assets financed by deposits contributes favorably to a bank's Return on Assets (ROA). A higher deposit-to-asset ratio (DTAR) suggests a more stable financial foundation that relies heavily on deposits, indicating that the bank has enough liquid assets to meet its deposit obligations. A strong deposit base boosts client trust and loyalty, encouraging regulatory compliance. It suggests that maintaining a strong deposit foundation is linked to improved financial performance. One possible explanation for this relationship could be related to how expenses incurred from debt financing through deposit mobilization are considered operational costs within Ethiopia's banking system. This result aligns with the trade-off theory of capital structure that states companies strive to achieve a harmonious equilibrium between the advantages (e.g., tax benefits) and disadvantages (cost associated with borrowing). This helps maintain asset levels and investment plans consistently over time Chechet and Olayiwola (2014). As per this theory, when financial performance improves and anticipated emergency costs decrease, companies may increase their leverage to benefit from tax advantages. These findings also support agency cost theories, which suggest favorable correlations between capital combination and firms' value. This study is in line with previous studies by (Parvin et al. 2020).

4.5.4. Capital Adequacy Ratio (CAR)

The coefficient for CAR is 0.003, but it lacks statistical significance ($p > 0.05$). These findings indicate that changes in the capital adequacy ratio should not be considered reliable indicators of variations in Return on Assets, as the coefficient does not have statistical significance. Although this study's regression results show that the capital adequacy ratio does not have a statistically significant influence on Ethiopian commercial banks, it still plays an essential role in ensuring their stability and soundness. While it may not directly influence ROA according to this model, maintaining sufficient capital is

essential for regulatory compliance and protection against financial risks. This discovery is consistent with prior research carried out by Hakim (2017) and Nguyen (2020), yet it contradicts the findings of a study conducted by Teshome et al. (2018), Suroso (2022), Sukmadewi (2020), as well as Datta and Al Mahmud (2018). These unexpected findings may stem from the diverse sectoral and institutional differences observed among countries, especially regarding their financial regulations and structures.

4.5.5. Growth of Assets

The coefficient for GA is -4.181, indicating that a one-unit rise in the growth ratio results in an expected decline in ROA of approximately 4.181 units, assuming all other factors remain constant. At the 0.05 level of statistical significance ($p < 0.05$), this coefficient shows a negative relationship between asset growth and ROA in the financial performance of Ethiopian commercial banks. Therefore, it can be concluded that if a bank experiences rapid growth in its assets, it may hurt the Return on Assets based on the negative coefficient associated with asset growth found through regression analysis.

There are several possible reasons for these negative results, including risk management challenges, deteriorating asset quality, liquidity constraints, overcapacity issues due to competitive pressures or economic conditions, as well as regulatory constraints and management decisions. This finding aligns with previous studies conducted by Taddese (2021), Kebede (2011), Kibrom (2010), and Ullah et al. (2017). However, it contradicts the findings of Chekole (2017) and Anarfo (2015), who suggest that asset growth has a positive and significant effect on profitability. Shibru (2012) and Pervin and Nowreen (2018), findings suggest that asset growth does not exert a significant influence on the capital structure of banks. Table 9 presents the summary of expected and actual results of the study

Table 9. Result summary.

Variable	Anticipated Result	Outcome	Significant Level 5%	Ho
Loan-to-deposit ratio (LDR)	Positive	Positive	Significant	Accept
Asset-to-equity ratio (ATER)	Negative	Negative	Insignificant	Failed to reject
Deposit-to-asset ratio (DTAR)	Positive	Positive	Significant	Accept
Capital adequacy ratio (CAR)	Positive	Positive	Insignificant	Failed to reject
Asset's growth ratio (GA)	Positive	Negative	Significant	Reject

5. Conclusions and Recommendations

The findings of this research offer valuable insights for professionals, policymakers, and scholars by shedding light on the influence of capital structure on the financial performance of private commercial banks in Ethiopia. The loan deposit ratio (LDR) has been identified as a significant determinant of Return on Assets (ROA), indicating the efficacy of utilizing deposited money for lending purposes. This phenomenon may occur because banks generate higher profits from the interest earned on customers' deposits compared to the interest received by depositors. This demonstrates that the allocated funds were effectively utilized for lending purposes. A positive loan-to-deposit ratio (LDR) indicates that loans are being disbursed using deposit resources, potentially reducing reliance on external funding sources. This demonstrates the implementation of responsible risk management strategies.

Similarly, the significant positive correlation observed between the total deposit-to-total asset ratio (DTAR) and the Return on Assets (ROA) indicates that banks possess an adequate amount of liquid assets to satisfy their deposit obligations. A strong deposit base additionally fosters consumer confidence and trust, thereby encouraging customer retention and regulatory adherence. In general, the robust correlation between DTAR and ROA underscores the criticality of deposit mobilization for the financial stability and

profitability of banks, thereby emphasizing the importance of maintaining a substantial deposit base.

On the other hand, the statistical analysis reveals that the Asset Total Equity Ratio (ATER) does not exhibit a significant association with Return on Assets (ROA). This implies that the direct impact of ATER on profitability is limited, as the influence of risk management approaches or operational effectiveness outweighs its relevance. This highlights the intricate nature of banking performance and underscores the significance of factors beyond ATER. Similarly, the capital adequacy ratio (CAR) is crucial in ensuring the stability of banks and adherence to regulatory requirements, while lacking statistical significance in our study. Maintaining adequate capital reserves is crucial in mitigating financial risk, despite its indirect impact on Return on Assets (ROA).

In addition, the existence of a negative association between financial performance and the Growth of Assets (GA) suggests that financial institutions can have difficulties related to the swift increase in their assets. An inverse relationship between the increase in assets and financial performance indicates that simultaneous problems, such as declining asset quality or inadequate liquidity, may outweigh the advantages of expansion. The observed inverse relationship underscores the significance of implementing cautious growth plans that prioritize the quality of assets over their number. This highlights the importance for financial institutions to thoroughly evaluate the influence of asset expansion on their overall stability, taking into account variables such as operational effectiveness, capital adequacy, and risk mitigation strategies. Moreover, this study makes a valuable contribution to the current body of knowledge by conducting a thorough analysis of the factors that influence the financial performance of commercial banks in Ethiopia.

Based on the results of this investigation, Ethiopian commercial banks are recommended to focus on certain areas for improved financial performance. Firstly, it is advised that banks concentrate on increasing their loan-to-deposit ratio (LDR), as this has a positive influence. This can be achieved by effectively using deposited funds for lending purposes and generating more interest revenue from loans. Additionally, maintaining a strong deposit base is encouraged as a higher total deposit-to-total asset ratio (DTAR) leads to better financial performance due to cost advantages compared to external borrowing methods. Furthermore, attention should be directed towards operational efficiency and risk management strategies since changes in Return on Assets (ROA) through fluctuations in the ratio of Asset to Total Equity (ATER) are difficult to predict. While the capital adequacy ratio (CAR) is important for stability and compliance with regulations, its direct impact on ROA was found to be not significant in this study's results. However, it remains crucial for overall bank health and resilience against potential risks. Lastly, careful management of asset growth is advised as rapid expansion can have negative effects on ROA according to this study's findings.

This study's shortcomings stem from its exclusion of macroeconomic elements such as inflation, GDP, political stability, government restrictions, and other variables specific to banks. It is recommended that future scholars further investigate this study by integrating supplementary macroeconomic and bank-specific variables that were not encompassed in the present analysis. Additionally, it would be advantageous to examine the wider ramifications of capital composition in the banking sector and other industries. Furthermore, the use of comparative analysis with other nations has the potential to yield valuable insights regarding the distinct aspects that impact banking performance within varying contexts.

Conflicts of Interest: The authors declare no conflict of interest.

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