FACTOR AFFECTING PROFITABILITY OF BANKS IN ETHIOPIA: THE CASE OF SELECTED COMMERIAL BANKS

PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE MSC IN ACCOUNTING AND FINANCE

BY

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DECLARATION

I hereby declare that this MSc thesis, "Factor affecting profitability of commercial banks: a case of selected commercial bunks in Ethiopia," is the product of my own research and effort, and that all references to sources of information used in the study have been properly cited. It has been submitted in partial fulfillment of the requirements for the Master of Science in Accounting and Finance degree. Under the guidance and support of my advisor, I produced it on my own. No other institution had received this study submission. The study conforms to the university's regulations.

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This certifies that the thesis, written by Afomiya Abebe Amare and submitted as partial fulfillment of the requirements for the Master of Science in financial and accounting degree, satisfies accepted standards for originality and quality and complies with university regulations. The thesis is titled Factor Affecting Profitability of Commercial Banks: A Case of Selected Commercial Banks in Ethiopia.

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ABSTRACT

This study aims to examine the impact of capital adequateness liquidity, and asset quality on the profitability of Ethiopian banks from 2013 to 2022. The study employed a quantitative research design and collected data through Secondary data were gathered from the annual audited financial statements of selected banks from NBE in order to meet the study's objectives. Purposive sampling was employed in the study, with Ethiopian commercial banks serving as the study population. Correlation and OLS regression analysis were utilized for inferential data analysis. Liquidity, capital adequacy, and asset quality were the study's independent variables. Return on asset (ROA) was the dependent variable used to determine profitability. The study's model result showed that while liquidity has a statistically significant negative impact on ROA, asset quality and capital adequacy have positive, statistically significant effects on ROA. The study suggests that more research be done on the qualitative relationship that asset quality, capital adequacy, and liquidity have with bank profitability. Future studies may be able to investigate the effects of asset quality, capital adequacy, and liquidity on profitability. In order to uncover hidden insights into the relationship that interacts with bank profitability, future studies involve interviewing significant informants in the banking sector.

Key Words: Bank of Ethiopia, Asset Quality, Capital Adequacy, Liquidity, Profitability

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List of Acronyms

AQ- ASSET QUALITY

AIB- AWASH INTERNATIONAL BANK

BOA-BANK OF ABYSSINIA

CBE- COMMERCIAL BANK OF ETHIOPIA

DB- DASHEN BANK

LLP-LOAN LOSS PROVISION

NBE-NATIONAL BANK OF ETHIOPIA

NPA-NON-PERFORMING ASSET

NPL- NON-PERFORMING LOAN

OLS-ORDINARY LEAST SQUARE

ROA- RETURN ON ASSET

ROE-RETURN ON EQUITY

WB-WEGAGEN BANK

CHAPTER ONE

1. INTRODUCTION

For an economy to have financial stability, the banking system's flexibility and stability are crucial. Banks must have high-quality assets, prudent liquidity management, and sufficient capital to support profitability in order to ensure financial stability. By making effective use of their assets and upholding their financial stability, banks can increase their profitability. Return on assets (ROA) is a very useful tool in profit center management. Profitable, steady, and efficient banks are also better able to withstand adverse shocks and can support the stability of the financial sector in particular as well as the economy overall. (Berhe & Ali, 2019).

Profit is a key performance indicator for banks, alongside productivity and financial and operational efficiency. Current awareness of all the variables influencing the bank's profit is necessary for an effective management of banking operations aimed at guaranteeing development in efficiency and profits. Commercial banks' profitability is measured using return on equity (ROE) and return on asset (ROA). Because equity capital, also known as return on equity (ROE), informs shareholders of how much money they may anticipate to receive from the bank based on the book value of their capital investment, it is a critical component in assessing profitability.

The dependent variable in this study that was used to calculate the banks' profit was return on assets, or ROA. The return on invested assets is measured by the ROA ratio, or net income to total asset. Macroeconomic (external) factors and bank-specific traits (internal) are independent variables. (Ngweshemi & Isiksal, 2021).

Asset quality and commercial bank profitability are favorably connected. The implication is that asset quality and financial performance have a positive trade-off; that is, the greater the asset quality, the lower the ratio of non-performing assets to gross/net assets. The credit administration programs of commercial banks and the quality of their loans are the fundamental factors that impact the asset quality of a loan portfolio. loans that pose a serious risk to the capital of commercial banks and make up a larger percentage of their assets (Cheruiyot, 2016).

For small-sized banks capital adequacy has affirmative positive impact on profitability of banks or ROA (J. Of & Development, 2020). A main causes of a business failure are lack of adequate capital (Ayanda & Christopher, 2013).

According to (Berhe & Ali, 2019) Ethiopian banks' profitability is mostly determined by internal factors like market share, diversity, capital sufficiency, and asset quality. While liquidity and bank size have a negative and large influence, these elements have a positive and significant impact on the bank's profitability (ROA). Liquidity negatively affects the profitability of Ethiopian commercial banks since there are fewer liquid assets overall than the statutory amount for precautionary purposes

Financial performance rises as liquidity management gets better. It suggests that liquidity management and bank financial performance are positively correlated(Joan,B. 2017) This explains that the financial industry would see improved financial performance if measures were made to raise bank liquidity.

According to (Berhe & Ali,2019) claim to have conducted research on the variables influencing the profitability of Ethiopia's commercial banks and to have drawn their final conclusions. The profitability of Ethiopian commercial banks is significantly impacted by both bank size and liquidity, but it is also significantly impacted by all internal factors. Market share, asset quality, capital sufficiency, and diversification all positively and significantly affect banks' profitability (ROA). The reason for this is that, in comparison to total assets, there are fewer liquid assets than the statutory amount designated for precautionary purposes.

In previous study (Shuremo, 2016) Research on the variables influencing bank profitability using data from Ethiopia's banking sector finds that capital had statistically significant effects on Ethiopian commercial banks' profitability.

And also, according to(Info, A., & On R. 2016) conduct research on the Jordanian case of the determinants of banks' profitability. According to Investment Management and Financial Innovations, the return on equity and return on asset metrics of profitability are adversely impacted by the asset quality variable. However, as indicated by ROA and ROE, capitalization, capital adequacy, and leverage are favorably influencing banks' profitability in Jordan.

By developing the conceptual framework for this research objective using an explanatory research design, a quantitative research approach, and statistical data analysis, this paper closes the discussion gap mentioned above and supports the finance literature regarding the effects of asset quality, capital adequacy, and liquidity on bank profitability. Additionally, the goal of this study is to investigate the aspects of asset quality, capital adequacy, and liquidity that influence banks' profitability in the context of a few Ethiopian banks.

1.1.Statement of the problem

Profitability analysis is vital because it sheds light on the economy and highlights the significance of profits as drivers of growth. The statutory amount is there as a safeguard, which explains why there are fewer liquid assets overall than total assets. The findings show how liquidity negatively impacts Ethiopian commercial banks' profitability. Market share, diversity, capital sufficiency, and asset quality are among the internal elements that have a major impact on Ethiopian banks' profitability. Furthermore, asset quality has a positive and considerable impact on Ethiopian banks' profitability. Lastly, the disadvantage of diseconomies of scale or scale inefficiencies for the Ethiopian banking sector is the reason why bank size has a negative effect on the profitability of Ethiopian banks.(Berhe & Ali, 2019).

according to Isayas, (2022) The profitability of private commercial banks is significantly impacted by a number of positive and significant factors, including capital adequacy, loan production, deposit funds, income diversification, managerial effectiveness, and bank size, while the number of branches and asset quality have a significant negative impact.

Researcher (Info, A,& On, R 2016) Determinants of bank profitability: The case of Jordan from 2005 to 2014 identifies the variables that impact bank profitability and explains how each of these variables affects the profitability of Jordanian banks using return on equity and return on asset as two metrics of profitability. The researcher found that capital adequacy, capitalization, and leverage all positively impacted banks' profitability (ROA) in Jordan. Additionally, capitalization and leverage had a favorable impact on ROE. and the assets quality variable has a negative impact on both profitability measures; the remaining independent factors have no bearing on how profitable Jordanian banks are. The structure of the banks' assets, according to the researcher, is what causes the negative effect of the asset’s quality variable. As a result, banks must reevaluate the quality of their assets in order to help lower the credit risk attached to them.

In previous study (Cheruiyot, 2016) the impact of asset quality on Kenyan commercial banks' profitability. The profitability and asset quality of Kenyan commercial banks are positively correlated. When the ratio of nonperforming assets to net asset value is lower in Kenyan commercial banks, it indicates a favorable trade-off between asset quality and profitability.

Kenyan commercial banks' profitability will increase with better spending management, and there is a positive correlation between capital adequacy and profitability in Kenyan commercial banks. A decrease in capital costs brought about by higher equity levels boosts profitability. demonstrating a favorable link as well between Kenyan commercial banks and liquidity management, indicating that there is enough liquidity to support this argument. The study's final conclusion on bank size indicated that the performance of commercial banks is positively correlated with their size, underscoring the significance of economies of scale in this relationship.

According to Lipunga, A.M (2014) The analysis of profitability is crucial for determining the overall health of a firm. But since the health of the banking industry is directly tied to the health of the economy as a whole, the industry's profitability is especially important. Listed commercial banks in developing nations focused on Malawi's profitability factors between 2009 and 2012, using both internal and external (market)-based profitability assessments. Multivariate regression analysis and correlation were used in the investigation. Return on Asset (ROA) and Earnings Yield (EY) are proxies for internal and external profitability, respectively. Regression study results indicate that capital adequacy has a negligible impact on ROA, but bank size, liquidity, and management effectiveness have statistically significant effects. However, the data indicate that bank size, capital sufficiency, and management effectiveness have a considerable impact on earnings yield, whereas liquidity has a little impact.

And according to Staikouras, (1996) The European Bank Determinants The profitability of European banks is influenced by profitability, shifts in the external macroeconomic environment, and variables pertaining to management choices. Banks with higher equity levels are assumed to be more profitable and to have an equity to asset ratio that is continually positive. The relationship between a bank's loans to assets ratio and return on assets (ROA) is inverse. This suggests that banks with higher non-loan earning asset sizes are more lucrative than those with higher asset dependency. The percentage of loan loss provisions to total loans is highly negative, but the funds gap ratio is significantly positive. Furthermore, the findings contradict research that looked at the structure-performance link for European banks and discovered that market share and/or concentration factors had a favorable impact on bank profitability.

According to the aforementioned empirical perspectives, research gaps or open questions were caused by differences in study variables, location, methodology, data analysis techniques, and the number of studies that were done on the factors influencing the profitability of Ethiopian commercial banks. Thus, the purpose of this study is to investigate how Ethiopian commercial banks' profitability is impacted by asset quality, capital sufficiency, and liquidity. Prior research did not take into account factors that affect return on assets (ROA), such as the liquidity ratio and asset quality. Additionally, resolve issues with methodology, applied explanatory research design, quantitative research methodology, and data analysis procedures for inferential statistics. Multiple linear regression was the specification model, while STATA 14.2 pairwise correlation and OLS regressions were utilized for data analysis and interpretation. To sum up the effect of liquidity on profitability concept is, noble, but the question remains whether it benefits the business.

1.2.1. Research Question

- What is the determinant of Ethiopian commercial banks' profitability?

1.2.2. Specific research question

- How asset quality affects bank profitability?
- What is the relationship between capital adequacy and ROA?
- How liquidity affects bank ROA?

1.3. Objectives of the Study

1.3.1 General objectives of the study

This study's primary goal is to look at the variables that influence Ethiopia's commercial banks' profitability.

1.3.2. Specific Objective of the Study

The study has the following specific objectives:

- To examine how asset quality affects bank profitability (ROA)

- To examine how capital adequacy affects bank ROA
- To examine how liquidity affects bank ROA

1.4. Hypothesis

Ha1. Bank profitability is positively and significantly impacted by asset quality (ROA).

A positive and significant relationship between asset quality and ROA are indicate in regression results.

Ha2. Bank profitability (ROA) is positively and significantly impacted by capital adequacy.

Regression study shows that capital adequate and return on assets have a positive and substantial relationship.

Ha3. Bank profitability is significantly impacted negatively by liquidity

The findings of the regression show that the association between return on asset and liquidity is negative and not very strong.

1.5. Significance of the study

The results of this study will be very beneficial to finance students in the future as they will provide pertinent literature that will enhance their understanding of the effects of asset quality, capital adequacy, and liquidity on banks' profitability. Additionally, the report contains significant data that shows how much the industry-specific characteristics unique to the banking sector impact banks' profitability. Additionally, it would serve as a guide and reference for researchers working in the field of commercial banks. This study would also open up new research areas.

1.6. Scope of the study/delimitation of the study

The issue of this study is the effects of asset quality, capital adequacy and liquidity on bank return on asset: the case of selected commercial banks of Ethiopia. So, this study used the hypothesis relationship of the variables. The profitability determinants such as asset quality,

capital adequacy and liquidity. The study would be conducting explanatory research design and quantitative research approach. As the source data audited finical statement would be used. The study's sample consisted of particular Ethiopian commercial banks. Around thirty banks are currently listed by the NBE in Ethiopia. Nonetheless, the study's population parameters included banks with more than ten years of operational experience as well as those that conduct business with seven (7) particular commercial banks. The research employed secondary data collection methods and inferential statistics for data analysis. STATA 14.2 was utilized to implement pairwise correlation and regression analysis.

1.7. Organization of the study

This research paper was prepared by five chapters. The first introduction chapter gives an insight into why conducting this research is of greatest importance which pacts about the background of the study, statement of the problem, research question, objective of the study (general and specific), hypothesis, significance of the study, scope of the study, and organization of the study. The second chapter describes review literatures related with the study that represent the detail discussion about the determinants of bank profitability. The third chapter deals about with research methodology, which includes research design, population and sample size, sampling techniques, source of data, data collection techniques, and data analysis techniques. The fourth chapter would provide data analysis and interpretation. and the last one chapter five contains summary, conclusion and recommendation.

CHAPTER TWO

2. REVIEW OF LITERATURES

The study's analyses section covers past research on a range of topics. Covering studies on the factors or components that affect the profitability of commercial banks. Previous research has found that a variety of factors influence the profitability of commercial banks, and various ratios can be used to measure that profitability. Three factors are considered independent: asset quality, capital adequacy, and liquidity. Return on asset, on the other hand, depends on other variables.

2.1. Theoretical Literature

Economic literature has paid close attention to banks' performance as measured by competition, efficiency, concentration, productivity, and profitability. The interests of bank profitability are those of academics, financial markets, bank supervisors, and bank management. This interest stems from the banking industry's growing consolidation, regulatory and technological advancements, and the blurring of borders between related financial products and industries as well as geographically (Jacob et al., 2005). The combination of inputs and outputs that bank management chooses will maximize profits. The Federal Financial Institution Examination Council adopted the CAMEL rating, or Uniform Financial Institution Rating system, on November 13, 1979. The National Credit Union Administration followed suit in October 1987. It has shown to be a successful internal supervisory tool for assessing a financial firm's soundness based on identifying the institutions that need extra care or attention (Dang, 2011).

The acronym for the five elements of bank safety and soundness is CAMEL.

- Capital adequacy
- Asset quality
- Management quality
- Earning ability
- Liquidity

In order to prevent potential losses and safeguard the financial institution's debt holder, capital adequacy refers to the capital expected to maintain balance with the risks experienced by the financial institution, such as credit risk, market risk, and operational risk (Dang, 2011).

2.1.1 Capital Adequacy Ratios

The following important financial ratios are used to estimate capital adequacy, and in order for a bank to be deemed good in the United States, it must fulfil the requirements listed below

Table2.1. ***Capital Ratios Analysis (AIA's CAMEL Approach for Bank Analysis, 1996)***

Ratios	**Formula**	**Criteria**
CAR1	Tier 1capital + Tier 2 capital Risk Weighted asset	≥8**%**
Equity capital to total Assets	Total capital Total Asset	≥4-6%

Source: (AIA's CAMEL Approach for Bank Analysis 1996).

According to NBE Directive CGFB/04/2016, "total risk-weighted assets" are the assets of a capital goods finance company that are determined by weighting each asset item according to the weight assigned to it and aggregating. "Total capital" is defined as the sum of paid-up capital, retained earnings, donated equity, legal reserve, and permanent free reserves acceptable to the National Bank of Ethiopia held by a capital goods finance company.

2.1.2. Asset quality

According to(Cheruiyot, 2016), asset quality is a facet of bank management that entails scrutinizing a bank's assets to determine the extent and magnitude of credit risk linked to its functioning.

According to(Singh et al., 2021) posit that non-performing loans (NPLs) may serve as a precursor to a banking crisis, given their detrimental impact on the country's economic resilience

through stifling credit expansion. While a high NPL can point to a weak financial system, a low level of NPL suggests a sound financial system. A high non-performing loan (NPL) ratio first impacts individual commercial banks and eventually devastates the country's financial system and economy as a whole. The banking system's efficiency is severely hampered by the rising trend of non-performing loans (NPLs), which raises the possibility of a banking crisis. More precisely, non-performing loans reduce interest income, eliminate investment opportunities, and cause liquidity problems in the financial system, all of which can exacerbate economic activity and lead to bankruptcy issues. Thus, for a stable financial system and economy, it is imperative to identify the factors that affect non-performing loans (NPLs) and reduce their level

According to(Warue, 2013) Every banking institution's primary objective is to run profitably in order to preserve stability and long-term growth. On the other hand, a high percentage of non-performing loans (NPLs) in the banking sector has a detrimental effect on private investment, makes it more difficult for banks to pay their debts on time, and limits the amount of credit that banks can extend to borrowers. Nonperforming loans are thought to be significantly influenced by both internal and external economic environments.

Loans or advances whose credit quality has deteriorated such that full collection of principals and/or interest in accordance with the contractual repayment terms of the loan or advances in question" is the definition of non-performing loans (NPLs) according to NBE (2018). Furthermore, it states that: "Loans classified as short term are non-performing assets (NPLs) if principal and/or interest are past due and unpaid for ninety days or more after the scheduled payment date or maturity. When principal and/or interest are past due and unpaid for twelve months or more after the scheduled payment date or maturity, medium- and long-term loans are considered non-performing loans (NPLs). Ethiopian commercial banks must categorize their loans as pass, special mention, substandard, doubtful, and loss in accordance with NBE (2018) directive

- **Pass**: Loans in this category are completely protected by the borrower's current financial situation and ability to repay them, so there is no room for criticism.
- **Special mention**: Medium- and long-term loans past due for six months or more, but less than twelve months, and short-term loans past due for thirty days or more, but less than ninety days.

- **Substandard**: Medium- and long-term loans past due for 12 months or more, but less than 18 months, and short-term loans past due for 90 days or more, but less than 180 days.
- **Doubtful**: Long- and medium-term loans past due for more than 18 months but less than 3 years, and short-term loans past due for more than 180 days but less than 360 days
- **Loss**: Medium-and long-term loans are past due for three years or more, while short-term loans are past due for at least 360 days.

All Ethiopian commercial banks must maintain the necessary minimum provision percentage against the outstanding principal amount of each loan, per the NBE (2018) directive. The following is a list of the minimal provision requirements:

Table 2.2: Minimum provision requirement

Articles	Classification category	Minimum provision short, medium and long-term loans
8.3.1	Pass	1%
8.3.2	Special mention	3%
8.3.3	Substandard	20%
8.3.4	Doubtful	50%
8.3.5	Loss	100%

Source NBE (2018)

According to(Dang, 2011) the asset quality requirements are taken into AIA's CAMEL approach to Bank Analysis (1996) as below:

- It is important to observe certain trends, like exposure to real estate, intra-group lending, and loan concentrations. A bank's loan portfolio will be vulnerable if it has a high degree of exposure to lending to certain business sectors and/or business entities and lacks diversification. As a result, AIA creates a portfolio mix that is equally distributed among a third of loans for consumers, businesses, and industries.

- Loan growth: has there been a significant surge in loans, and what kind of loans are being made? Are strict standards being adhered to, or are they becoming slack because of competition?
- Non-performing loans: quantity, make-up, reasons for significant rises or falls, definition of NPLs.
- What is the ratio of reserves to the total amount of loans and non-performing loans?
- Exposure to real estate includes the proportion of loans based on real estate and the kind of lending—residential or commercial.
- The intra-group exposure pertains to the primary businesses of the group, the amount of lending to affiliated companies, and the ownership level.

Table 2.3: Asset Quality Ratios Analysis (AIA's CAMEL Approach for Bank Analysis 1996)

Ratio	Formula	Criteria
NPLs to total loans	NPLS /total loans	≤1%
NPLs to total equity	NPLS/ total equity	≤1%
Allowance for loan loss ratio	Allowance for loan loss/Total loans	≥1.5%
Provision for loan loss ratio	Provision for loan loss/Total loans	≥100%

Source: (AIA's CAMEL Approach for Bank Analysis 1996)

Each of the components in the CAMEL rating system is scored from 1 to 5. In the context of asset quality, a rating of 1 indicates a strong asset quality and minimal portfolio risks. On the other hand, a rating of 5 reflects a critically deficient asset quality that presents an imminent threat to the institution's viability. (Uniform Financial Institutions Rating System 1997, p. 5).

According to NBE (2018), Banks shall report to the national bank on a quarterly basis loan or advance which exceed 5% (five percent) of the bank's total capital that have been restored from non-accrual to accrual status.

2.1.3. Management quality

Management quality is basically the capability of the board of directors and management, to identify, measure, and control the risks of an institution ‘s activities and to ensure the safe, sound, and efficient operation in compliance with applicable laws and regulations (Dang, 2011).

AIA approach to bank analysis states that the management has clear strategies and goals in directing the bank’s domestic and international business, and monitors the collection of financial ratios consistent with management strategies. The top management with good quality and experience has preferably excellent reputation in the local communication. The management requirements are taken into AIA’s CAMEL approach to Bank Analysis (1996) as below:

- Ownership: the bank is majority-owned by the government because government support is the most important mitigating factor to potential financial problems, or by large Private Corporation that have economic significance.
- Size: top local ranking in term of assets.
- Year of operations: long operation history since establishment.

Each of components in the CAMEL rating system is scored from 1 to 5. In the context of management, a rating of 1 is assigned to note the management and board of directors are fully effective. On the other hand, the rating of 5 is applicable to critically deficient management. Replacing or strengthening may be needed to achieve sound and safe operations(*Www.Ijsrp.Org*, 2017).

2.1.4. Earning ability

This rating reflects not only the quantity and trend in earning, but also the factors that may affect the sustainability of earnings. Inadequate management may result in loan losses and in return require higher loan allowance or pose high level of market risks. The future performance in earning should be given equal or greater value than past and present performance(*Www.Ijsrp.Org*, 2017).

The earning requirements are taken into AIA’s CAMEL approach to Bank Analysis (1996) as mentioned below:

- Majority of earnings is annuity in nature (low volatility).
- The growth trend of the past three years is consistent with or better than industry norm and there are multiple sources of income (both interest and non-interest income).

2.1.5. Liquidity

There should be adequacy of liquidity sources compared to present and future needs, and availability of assets readily convertible to cask without undue loss. The fund management practices should ensure an institution is able to maintain a level of liquidity sufficient to meet its financial obligations in a timely manner; and capable of quickly liquidating assets with minimal loss(Dang, 2011).

Liquidity risk has become one of the most important elements of risk management framework in financial institutions. A financial institution's liquidity framework should maintain sufficient liquidity to withstand all kinds of stress events that will be faced. CARE evaluates liquidity risk by examining the stated liquidity policy, the assets liabilities maturity (ALM) profile, collection efficiency and deposit renewal rates (based on empirical evidence), etc. More specifically CARE measures following parameters(Car, 2020).

The liquidity requirements are taken into AIA's CAMEL approach to Bank Analysis (1996) as below:

- Majority of the funding is coming from customer's deposits, and no concentration of funding sources.
- Is there a maturity or interest rate mismatch?
- Does the central bank impose reserve requirements

Table 2.4: Liquidity Ratios Analysis (AIA's CAMEL Approach for Bank Analysis 1996

Ratios	Formula	Criteria
Customer deposits to total assets	Total customer deposit/total assets	≥75%
Total loan to customer deposits (LTD)	Total loans/total customer deposits	≤80%

Source: (AIA's CAMEL Approach for Bank Analysis 1996)

Each of the components in the CAMEL rating system is scored from 1 to 5. In the context of liquidity, a rating of 1 represents strong liquidity levels and well-developed 25 funds as the institution has access to sufficient sources of funds to meet present and anticipated liquidity needs. On the other hand, the rating of

5 signifies critical liquidity deficiency, and the institution demands immediate external assistance to meet liquidity needs(Dang, 2011).

2.2. Empirical literature

Empirical studies found the factors that affect bank profitability. Here the study tried to review literature that was conducted previously on the determinants of bank profitability.

2.2.1. Worldwide Empirical Reviews

The internal determinants of bank profitability are generally influenced by bank management strategies and decisions. These determinants could also be termed micro or bank-specific factors that basically reveal the differences with regard to sources and uses of funds management. capital, liquidity and expenses management, i.e. the level of liquidity, provisioning policy. operational efficiency, capital adequacy, expenses management and bank size. For example, in most prior studies, internal determinants focused on bank-specific variables such as bank size. risk, capital ratio, loans and deposits. On the other hand, the external determinants are variables that are not related to bank management and generally they reflect the economic and legal environment (both industry-related and macroeconomic) that affects the operation and the performance of financial institutions, i.e. economic growth, inflation and market capitalization(Menicucci & Paolucci, 2016).

According to(Menicucci & Paolucci, 2016) The bank size, represented by total assets, is the main determinant of European banks' profits, supporting the argument that large banks have took advantage of economies of scale, and also show that capital strength, measured by equity to total assets, is a significant determinant of bank profitability in Europe. Well-capitalized banks face lower costs of external financing and such an advantage can be translated into higher profitability. The loan ratio is statistically significant only when NIM is used in the regression model, otherwise it is insignificant. Hence, loan ratio is not able to explain the variability of European bank's profitability measured by ROE and ROA. On the contrary, the impact of deposits (DEP) on ROE and ROA is positive and significant but insignificant on NIM. Finally. empirical results reveal that provisions to total gross loans ratio (LLP) is another internal

determinant of bank profitability in Europe; however, the relationship is negative. The impact of LLP on bank performance is always statistically significant, but the statistical relevance varies according to the measure of profitability used. The success of the European banking sector depends on its efficiency, profitability and competitiveness. Thus, from a regulatory perspective, the performance of a financial sector is based on its efficiency and profitability. To attain this objective, it would be helpful to identify the profitability determinants of successful banks to formulate policies for intensifying and maintaining the strength and the stability of the banking sector in Europe.

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According to (J. Of & Development, 2020) Bank profitability is measured by return on assets and return on equity. Apart from capital adequacy ratio, we also control various potential determinants of profitability including bank-specified variables (capital adequacy ratio, net interest margin, non-performing loans, non-interest income, ownership and regulatory variable proxied by the bank's application of Basel standards), and macroeconomic indicators (growth rate of gross domestic product, inflation rate). Using panel data regression analysis with a sample of 22 Vietnamese commercial banks for the period 2010-2018, this paper shows that bank capital adequacy, net interest margin, and non-interest income measures are positively correlated with profitability indicators while n-performing loan indicator and state ownership measure negatively effect on bank profitability. Also provides a more in-depth analysis of the impact that bank capital adequacy imposes on profitability by dividing the sample into two subsamples of large-sized banks and small-sized banks. We find that bank capital adequacy has a positive impact on return on assets for small-sized banks meanwhile it has no significant impact on profitability for large-sized banks in Vietnam. In another aspect, also finds that the large-sized banks' return on assets, as well as return on equity, are not significantly correlated with the Basel II implementation meanwhile it is statistically meaningful to the small-sized banks' situation.

According to(Michael et al., n.d.) Frequent changes in technology required for modern banking. stringent prudential norms, increasing competition, worrying level of NPA's, rising customer expectations, increasing pressure on profitability, assets-liability management, liquidity and credit risk management, rising operating expenditure, shrinking size of spread and so on, are challenges that faced by banks. And bank's management gives attention on profitability. In fact.

In addition to productivity, financial and operational efficiency profit is an important criterion to measure the performance of banks. An efficient management of banking operations aimed at ensuring growth in profits and efficiency requires up to date knowledge of all those factors on which the bank's profit depends.

According to Obamuyi (2013), The probability of the macroeconomic factors known as external factors and the internal factors of banks was found to be either more or less significant. Macroeconomic factors are referred to as external factors, and bank-specific factors are referred to as internal factors. The management of a bank has a significant impact on internal factors. In order to ascertain the profitability of the banks in both countries during the post-financial crisis, this study analyzed the aggregate data of 20 banks in Bangladesh and 20 banks in India from 2010 to 2020. It also looked at dependent variables like BS, DAR, DTAR, EAR, DER, LDR, IR, and GDPGR as well as independent variables like ROA and ROE. The variability of determinants over different years was discovered through multiple regression analysis between ROA and bank-specific and macroeconomic variables, and ROE and bank-specific and macroeconomic variables. In both countries, the analysis revealed that the GDP Growth Rate (GDPGR), Bank size (BS), Inflation Rate (IR), and Debt to Asset Ratio (DTAR) had a positive impact on ROA, while the Deposit to Asset Ratio (DTAR) and Loan to Deposit Ratio (LDR) were found to have a negative and significant impact on ROA. Additionally, the analysis revealed that the Bank size (BS), EAR-Equity to Asset Ratio, and GDP Growth Rate (GDPGR) were found to have a positive and significant impact on ROE, while the Deposit to Asset Ratio (DTAR), Inflation Rate (IR), and Debt to Equity Ratio (DER) had a negative and significant impact on ROE. Owing to the highly competitive environment in the banking industry, the bank's profitability as measured by ROE and ROA 10 is not significantly impacted by BS. Regarding the size of banks and the profitability relationship of Indian banks, we observe negative signals for all bank types; however, for Bangladeshi banks, we find a significant positive impact on ROA and a significant negative impact on ROE. Understanding the phenomenon of a company's sound and sustainable financial position is made easier with the help of profitability analysis. A bank's growth patterns and financial success can be explained in part by its profitability. Therefore, it is essential to look into the variables that affect bank profitability.

2.2.2. African empirical views

According to (Obamuyi, 2013) Impacts of capital size, interest rate, expenses management and economic condition on banks' profitability in Nigeria. These factors affecting banks' profitability were categorized as bank-specific variables (bank capital, size and expense management) and macroeconomic variables (interest rate and GDP, proxy for business cycle). Some previous findings result confirm banks profitability in Nigeria have statistically significant relationship with the bank capital, expenses management, interest rate and the economic situation of the country. The results indicate that improved bank capital and interest income, as well as efficient management of banks' expenses and favorable economic condition contribute to higher banks performance and the study will guide the policy makers and bank regulators in the formulation and implementation of macroeconomic policies which may affect the stability of the banking system in Nigeria. Accordingly, the impact of GDP growth rate on profitability indicates that banks can achieve higher (lower) profitability under favorable (unfavorable) conditions. Government policies in Nigerian banking sector must encourage banks to regularly raise their capital and provide the enabling environment that will accelerate economic growth in the country. These results have important implications for banks survival and growth.

According to(Ayanda & Christopher, 2013) The major causes of business failure is lack of adequate capital. In Nigeria, the banking industry is regulated by the Central Bank of Nigeria. As at 2010, the minimum capital requirement for Commercial banks that intend to be in operation was N25 Billion. In order to rise this capital, banks needed to mix both debt and equity strategically for the purpose of achieving an optimum capital structure. Capital Structure therefore, measured by Leverage can be narrowed down into long term debt equity and short-term debt/equity. Short-term debt exposes a firm to refinancing risk, used within reasonable limits and is justified by cost and asset matching considerations. When market value of equity is above its book value, the firm is able to sell additional equity if the need arises. It is now prevalent that short-term financing become a necessity in the firm's need of working capitals or representing an ongoing portion of the asset base. Although equity financing is more expensive than employing debt, striking a balance of both elements is deemed reasonable.

According to (Ngweshemi & Isiksal, 2021) Tanzanian commercial banks profitability has been addressed by both internal and external variables. The results demonstrate that profitability is

more decided by internal bank-specific variables which are capital adequacy, asset quality, loan composition, and cost efficiency as the variables have a strong and significant effect on bank profit than deposit ratio and the macroeconomic factors which are inflation rate and GDP growth.

According to (Festus, 2015) Kenyan commercial banks financial performance is highly dependent on the level of the institutions' liquidity. There is also a positive association between liquidity management and financial performance of banks. This implies that an improvement in liquidity management leads to a rise in financial performance. This explains that, efforts to stimulate the banks liquidity would see the financial sector realize increased financial performance. Thus, this would result to increased efficiency in the sector's operations. Banks should improve on their liquidity more so the ability of the banks to promptly repay the depositors. As the findings illustrated, financial performance of commercial banks in Kenya is highly dependent on the level of the institution’s liquidity. To facilitate favorable financial performance of these institutions, strategies to facilitate increased liquidity of banks should be adopted by the institutions for their efficiency in financial operations.

According to Lipunga (2014), The study aimed to comprehend the factors that influence internal profitability, as determined by return on assets (ROA), and external profitability, as determined by earnings yield (EY), using data from Malawi and listed commercial banks in developing nations. The findings indicate that while capital adequacy has been proven to have a minor effect, bank size, liquidity, and management effectiveness all significantly affect ROA. The results indicate that capital adequacy, management effectiveness, and bank size have a considerable impact on earnings yield. Conversely, it was discovered that liquidity had little bearing on earnings yield. Evidence from Malawi, factors influencing listed commercial banks' profitability in emerging nations, and an effort to comprehend the factors influencing internal.

(Festus, 2015) Asset quality effects on the financial performance of commercial banks in Kenya, the main objective of this study was too determinate and evaluate the effects of asset quality on the financial performance of commercial banks in Kenya. Data from 2010 to 2014 of 43 commercial banks was analyzed using multiple linear regressions method. From the discussion of the findings above, it was concluded that the asset quality is one of the significant factors influencing the financial performance of commercial banks in Kenya. The analysis showed that

all the asset quality factors had some level of statistical significance on financial performance. The negative relationship between asset quality and financial performance of commercial Banks in Kenya was confirmed through the analysis results obtained. The ratio of total investment assets to total assets was also significant in influencing performance in that, it reduced the impact of Non-Performing Assets to the financial performance since through increasing the varied investments levels would result to the diversification of risks and returns to a wider scope thereby maintaining a certain level of financial performance despite increase in Non-Performing Assets. Banks which had low Non-Performing Assets ratio to Total Assets performed better than those with high levels Non-Performing Assets to Total Assets in their portfolios. The banks with more risky assets (Non-Performing Assets) on their balance sheet, lowers their capital reserves implying greater credit risk exposure. The ability of management to identify, measure, monitor and control credit risk is also reflected by this ratio. The quality of assets is an important parameter to gauge the strength of the bank.

According to Lipunga, (2014) In sub-Saharan Africa commercial bank profitability determines, Bank profits are high in SSA compared to other regions. This picture holds true whether profitability is measured as returns on assets, returns on equity or net interest margins, High bank profitability can reduce financial intermediation if the high returns imply that interest rates on loans for the same maturity-are higher than in other parts of the world. Moreover, if high returns are the consequence of market power, this would imply some degree of inefficiency in the provision of financial services.

In this regard, unusually high returns should rapid policymakers to introduce measures to lower risk, remove bank entry barriers if they exist as well as other obstacles to competition, and lower regulatory costs. But bank profits are also an important source of equity. If bank profits are reinvested, this should lead to safer banks, and, consequently, high profits could promote financial stability. The main conclusion in this study is that bank-specific and macroeconomic risk factors are the most important explanations for banks' high returns in SSA. We do not obtain definite results as to whether market power influences bank returns. The evidence that returns are reinvested in capital with a significant lag gives some support to a policy of imposing higher capital requirements to strengthen financial stability in SSA.

2.2.3. Ethiopia Empirical Reviews

According to(Abdissa, 2019) factor affecting banks return on asset evidence from banking industry in Ethiopia: Study observes the effect of bank-specific, industry-specific and macroeconomic determinants on banks' profitability in Ethiopia. The study applied balanced panel data of eight Ethiopian commercial banks that covers the period of 2002-2012. The paper uses ordinary least square (OLS) technique to see the impact of determinants on profitability of Ethiopian commercial banks. The findings of the study show that all bank specific determinants except credit risk and expense management have statistically significant and positive relationship with banks' profitability. On the other hand, variables like credit risk, expense management and regulation have a negative and statistically significant relationship with banks' profitability. All macroeconomic determinants in this study like economic growth, interest rate spread and exchange rate have statistically significant and positive relationship with banks' profitability.

(Berhe & Ali, 2019) Ethiopian commercial banks factor affecting a profitability, throughout 2006 to 2017 and the study used a sample of eight commercial banks with 96 total observations. Secondary data gathered from the annual financial reports of the banks in the sample was used in the study. Ethiopian Central Statistical Authority and Ethiopian Central Bank, Market share, bank size, capital sufficiency, liquidity, asset quality, and diversification are the macroeconomic variables taken into account as independent variables in this study, while economic growth and inflation are the internal factors. Furthermore, banks' profitability was used as the dependent variable, and return on assets (ROA) was used as a proxy for it. To determine the effect of these variables on the previously mentioned problem, the study used the ordinary least squares technique. The findings showed that while bank size and liquidity were found to have a negative significant influence on the same subject, diversification, market share, capital adequacy, asset quality, and economic growth had positive significant effects on the profitability of the banks. Furthermore, the results indicate that the profitability of Ethiopian commercial banks is positively impacted by inflation, albeit marginally.

According to Tesfaye Diriba, (2014) determinants of commercial banks performance in Ethiopia, performance in terms of profitability, prospects, challenges and policy implications the result showed that equity to total asset proxy of capital adequacy, loan loss reserve proxy for credit risk, loan to deposit proxy for liquidity risk, inflation rate and year dummy became key

determinants of profitability in Ethiopian commercial banks in the period under consideration. But some variables such as capital adequacy, liquidity risk and inflation rate should have been positive in theory but had negative impact on profitability. From financial stability perspective, regulator concern mainly about stability, safe and soundness of the banking sector where as the commercial banks mainly interested in maximizing their own profit for their existence in both short and long run.

The commercial banks management would also able to manage the asset ownership and number branch network so that their asset will be used in productive area. The capital adequacy of the bank was also high which mean that there is high provision and that implies there are loan that are not performing well. Whereas bank size and total loan to total asset did not have any significant impact on profitability. From macroeconomic factors, inflation has positive impact on profitability of commercial banks. Robust regression test was almost not conservative it is done to check weather a change in model or some assumptions relaxation may lead to lost for some variables significance or not.

(Isayas, 2022) Cogent Economics and Finance the purpose of this study was to look into the key variables influencing the profitability of Ethiopian banks that operated from 2008 to 2019. Return on assets (ROA) was used by the researchers as a measure of profitability against a number of regressed internal and external variables. The analysis's findings indicate that firm-specific factors like size, liquidity, leverage, capital adequacy, and asset tangibility have a positive and statistically significant impact on the profitability of Ethiopia's commercial banks. These factors also appear to have an impact on a firm's financial performance and profitability. However, even though it is statistically insignificant, there is a negative correlation between financial performance and the age of the commercial bank, which supports the idea that a company with a longer history of operation will be more cautious about making any changes that could improve its financial performance. In terms of the macroeconomic variables, the regression result indicates that the GDP growth rate has a positive and significant impact on the financial performance of Ethiopian commercial banks, while inflation has a negative but negligible effect on the profitability of commercial banks in Ethiopia.

The profit determinant factors that were used in this study span the years 2001–2013According to (Tibebe et al., 2022) These variables include capital adequacy, asset quality, administration cost, bank liquidity, managerial efficiency, loan production, deposit fund, income diversification, number of branches, and bank size. As anticipated, the variable capital adequacy is a positive and statistically significant predictor of profitability at the 5% significance level for both the ROA and ROE models. Consequently, it can be said that companies with high capital ratios typically generate higher profits by converting the safety advantage into profit. Banks and other financial institutions have financial flexibility based on their capital size. It indicates the financing options that the entity has access to. Thus, one of the primary factors influencing the profitability of Ethiopia's private commercial banks is capital adequacy.

The study demonstrates how low asset quality hurts bank profitability and vice versa. This was consistent with the theory that lower firm profitability is typically linked to increased exposure to credit risk. Therefore, it suggests that by enhancing credit risk screening and monitoring, banks would increase profitability. Since loans account for the largest portion of interest-bearing assets and allow banks to earn more profit from interest income, it is concluded that loan and advance production has a positive and highly significant impact on ROA and ROE at the five and ten percent significance levels, respectively. The profitability of private commercial banks is positively and significantly impacted by deposit funds. According to the study's findings, banks that have consistently maintained high deposit levels in relation to their assets are the ones that perform the best. Raising the ratio of total deposits to total assets indicates that the bank has more money available for use in lending and investment activities, among other lucrative endeavors. Consequently, the profitability of the bank ought to rise. The study discovered a strong and positive correlation between the profitability of private commercial banks and managerial efficiency, or quality of management. It is discovered that, at the 1% significant level, bank size has a positive and highly significant impact on profitability (in terms of both ROA and ROE). The correlation between bank size and profitability is positive, indicating that larger banks typically generate higher profits by taking advantage of economies of scale. Furthermore, this result is in line with the Market-Power (MP) hypothesis, which postulates that a firm's relative size increases its market power and profits. The researcher deduces from this finding that banks with substantial size can make more money than banks with a smaller footprint. This study concludes that income diversification contributes to the explanation of the

variability in ROA and ROE of private commercial banks in Ethiopia, respectively, in a positive and statistically significant way at the 5% and 1% significance levels.

According to(Merin, 2016) states that secondary data is used to determine the factors that affect bank profitability in Ethiopian private banks. The National Bank of Ethiopia and the audited financial statements of six selected private commercial banks for the years 2004 to 2011 provided the data. The analysis of variables that other researchers have overlooked, such as labor productivity, overhead, liquidity, and market share, was one of the study's novel features. Return on assets (ROA) was the dependent profitability variable used in the study. Furthermore, the study employed explanatory variables that were both external and Hank-specific. To analyze the relationships between the dependent variable and the explanatory variables, two methods were used: descriptive statistics and econometrics models, specifically fixed effects estimation. The study's main conclusions indicate that bank-specific factors were more crucial in explaining profitability than external factors. The profitability of Hank's drivers was found to be positively and significantly correlated with asset size, capitalization, labor productivity, liquidity, and non-interest income; however, bank-specific drivers' profitability was negatively impacted by credit risk and overhead efficiency. At a 10% confidence level, the variable Asset size's (LOGTA) coefficient demonstrated a positive magnitude and significance. The efficient structure hypothesis and economies of scale were validated by it. However, the magnitude of LOGTA2 has demonstrated a negative coefficient; consequently, the negative quadratic effect of size suggests that diseconomies of scale arise beyond a certain point as a bank grows in size. This is because banks that grow too big may experience managerial inefficiencies and bureaucratic bottlenecks. As measured by ROA, the Capital (EA) result showed a positive coefficient and significant at the 1% level of significance on profitability. This finding might suggest that private banks with higher equity have lower capital costs and are therefore more profitable. It demonstrated a bank's capacity to manage risk exposure with investors and absorb losses. Labor productivity (PR) has a positive and significant 1% impact on the profitability of private banks in Ethiopia. Liquidity (LQD) had a significant positive coefficient and a positive relationship with profitability. It calculates the bank's liquidity positions in relation to the total number of deposits. One of the primary causes of bank failures is insufficient liquidity. At the five percent confidence level, the ratio was significant. This finding suggests that investing in less risky, short-term

securities such as government treasury bills increases profitability. However, the coefficient was low, suggesting a negligible effect.

According to (Tibebe et al., 2022) Determinants of Profitability of Commercial Banks in Ethiopia: on Internal Factors study was to investigate determinants of commercial banks profitability in Ethiopia a study on internal factor by using panel data of thirteen commercial banks from year 2010 to 2018 The study employed an explanatory type of research and secondary financial data were used. On this study Return on Asset (ROA) has been used as a proxy variable for the dependent variable. Based on the result of Haussmann specification test the study used fixed effect model. The fixed effect regression model was applied to investigate the effect of bank size, capital adequacy, liquidity risk, operation efficiency, debt management. funding cost, and loan to asset ratio on profitability. The major findings of the study show that, operation efficiency, capital adequacy and bank size have statistically significant and positive relationship with banks' profitability. However, the relationship for liquidity risk, debt management, funding cost, and loan to asset ratio were found to be statistically insignificant. The study suggests focusing and redesigns the firms together with significant key internal drivers of profitability of commercials banks in Ethiopia.

Based on (*The Impact of Capital Structure on Profitability of Commercial Banks in Ethiopia Aragaw Hailu*, 2013) sample of eight commercial banks for the year of 2001/02 2012/13) it was pragmatic that 89% of the total capital of commercial banks in Ethiopia in the period under study was made up of debt. Of this, 75% constitute deposit and the remaining was non-deposit liabilities. This has repeated the fact that banks are highly levered institutions. The findings revealed that capital structure as measured by total debt to asset had statistically significant negative effect, whereas deposit to asset had statistically significant positive effects on Profitability of core business operations of commercial banks. Moreover, loan to deposit, spread and asset size also had statistically significant and positive relationship with profitability. However, growth found to have statistically insignificant effects on profitability. Therefore, banks should give due consideration to manage their debts properly, mobilize deposit sufficiently, increase loan advances, spread, and size in their financing decisions. Furthermore, banks also advised to reduce non-deposit debt financing and raise equity financing so that to keep costs of financing at minimum level and hence optimize profitability and the value of banks. In conclusion, the finding of the study suggests that capital structure had significant

impact on profitability of core business operations of commercial banks. And implies managers need to consider this impact in their financing or capital structure decision.

2.3. Summary of Research Reviews and Literature Gaps

The theoretical and empirical review shows discuss the cause of variable difference, methodological difference, data analysis technique difference, and study area difference.

According to(Joan, 2017) The study reveals a strong correlation between Kenyan commercial banks' financial performance and their liquidity levels, suggesting that improved liquidity management leads to improved financial performance and increased efficiency.

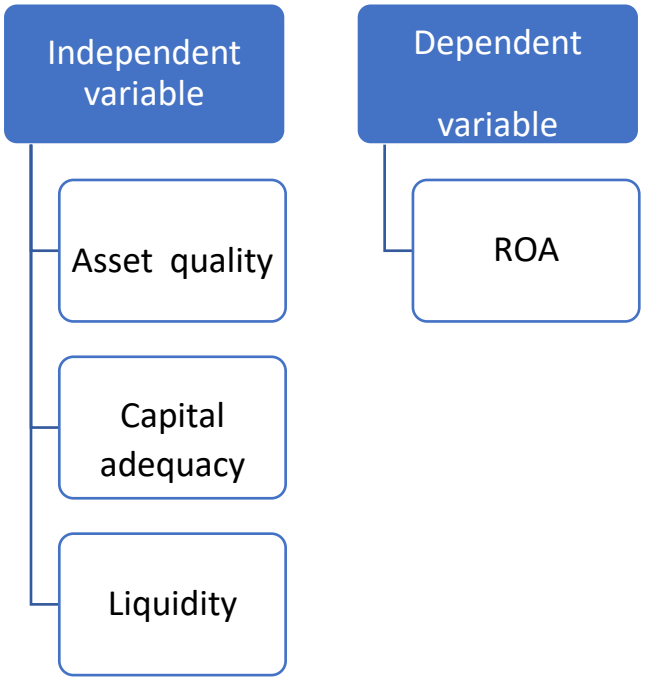
(Cheruiyot, 2016) The study reveals a positive correlation between asset quality and profitability in Kenyan commercial banks, with lower nonperforming assets ratios indicating higher asset quality. The study also highlights the importance of economies of scale.

According to (Lipunga, 2014) The study examines the profitability of publicly traded commercial banks in Malawi from 2009 to 2012 using multivariate regression analysis and correlation. Results show that bank size, capital adequacy, and management effectiveness significantly impact return on assets (ROA) and earnings yield, respectively. However, liquidity has a negligible impact. The study suggests that previous research on factors affecting commercial banks' profitability produced varied results.

2.4. Conceptual framework

The study's dependent variable, banks' profitability, is used to measure proxies, such as return on asset (ROA), and is presented alongside independent variables. where the explanatory variables were liquidity, capital adequacy, and asset quality.

Figure 1.1: conceptual framework diagram



Conceptual framework of the study

CHAPTER THREE

3. RESEARCH METHODOLOGY

3.1. Research Design

The research design type that the study would use is explanatory. By establishing cause-and-effect relationships, explanatory research design is responsible for determining the reasons behind events. In this way, explanatory research can use hypothesis testing to address the identification of causes as well as effects. According to the author (Fidias G. Arias-Odón, 2012) the findings and conclusions of such studies reflect the highest level of knowledge.

3.2. Research Approach

This study employed a quantitative approach. In quantitative research, numerical data collection and the use of mathematical methods—particularly statistics—are used to describe a problem or phenomenon (Aliaga, M. and Gunderson, B., 2002).

3.3. Target population of the study

The population of Ethiopian commercial banks for which data on the impacts of asset quality, capital adequacy, and liquidity on bank profitability were available was used in this study. There are currently about thirty (30) banks in Ethiopia, according to the national bank of Ethiopia (Edem, 2024). However, the population parameters for this study only include banks that have been in operation for ten years or more and only engage in commercial activity.

3.4. Sampling technique and sampling size

The study was conducting a purposive sampling technique. The method for performing purposive sampling is fairly straightforward. All a researcher must do is reject the individuals who do not fit a particular profile when creating the sample

(https://www.alchemer.com/resources/blog/purposive_sampling-101). And in this technique, sampling units are selected according to the purpose. Purposive sampling provides biased estimate and it is not statistically recognized(Ajay & Micah, 2014).

Purposive sampling enables researchers to squeeze extract lot wealth information out from data collected data. allows enables to describe delineate major significant impact of findings have the population. population. The parameters included only banks were with experience equal and to or exceeding 10 years and maker engaged solely in activity. activities. study sample was comprised (7) commercial banks of in Ethiopia: These are, Awash International bank, Bank of Abyssinia, Commercial bank of Ethiopia (CBE), Dashen Bank, Hibret Bank, Nib international Bank and Wegagen Bank and also, used 10 years audited financial statements for 2013- to- 2022

3.5. Source of data and method of data collection

3.5.1. Data Sources

The data used for the research will come from the annual published audited financial statements reports of those seven banks, namely Wegagen Bank, Awash International Bank (AIB), Bank of Abyssinia, Dashen Bank, Hibret Bank, Nib International Bank, and Commercial Bank of Ethiopia. The research will be conducted using secondary sources.

3.5.2. Method of Data Collection

The secondary data source for this study would be conducted (Syed Muhammad Sajjad, 2018) argues that secondary data collection is a method that draws information from sources that have already been published in some form. Because of this, the researcher saves time and money, enhances comprehension of the issue, and offers a foundation for comparison for the data that is gathered. The study area, goal, and hypothesis variables are therefore susceptible to this kind of data source. This kind of data source is definitely not limited to the weak. Regression and correlation analyses are performed using the most recent ten years' worth of financial statements from listed institutions to determine profitability.

3.6. Method of Data Analysis technique

This research would conduct inferential statistics. Inferential statistics are used to test research hypotheses. According to Press, T.M. I. T., & Review, T. (1967), state that in order to determine how the study's explanatory variables and dependent variable relate to one another, data analysis will use correlation matrices and basic linear regression. The level of dependence or lack thereof between Y and X is not taken into account. As evidenced by the variances of estimated regression coefficients, it is true that the degree of dependence between Y and X affects the estimation and specification of interdependence in X as well as a tendency toward misspecification. In order to solve this problem, it's critical to distinguish between causes and effects and to build diagnostics around the former. Regression analysis and correlation matrix analysis will be used in this study. data analysis will involve correlation matrix and simple linear regression to examine the relationship between the dependent variable and explanatory variables in the study. (A. Eljelly Emerging, 2004), states that we can estimate the average values of Y associated with the given Xs by using a mathematical equation that expresses the relationship between two or more variables. Regression analysis is the term for this type of analysis. A quick and easy way to summarize the direction and strength of a relationship between two or more numerical variables is to use correlation. The study employed STATA software as its analysis tool, which was used for the estimation. The hypothesis was tested using the coefficient of determination and p-value, the associated probability. The summary was based on the p-value; if the null hypothesis of the beta is rejected, the overall model is significant; if the null hypothesis is accepted, the overall model is insignificant. Put another way, if the p-value is less than 0.05, it is concluded that the model is significant and has good predictors of the dependent variable and that the results are not random

3.7. Model Specification

This study used the multiple linear regression model to examine how the explanatory variables affected the explained variable. Multiple explanatory variables will appear in the equation because multiple linear regression uses multiple explanatory variables. Subscripts will be added to the equation to identify the explanatory variables from one another. The dependent variable in this study is bank profitability, which is measured using return on asset (ROA). The independent variables are asset quality, capital adequacy, and liquidity.

General model

$$\mathbf{yit_{=\beta_0} + \beta_{1x_i} + \beta_{2x_2} + \cdots + \beta_K x_k + \epsilon it}$$

Were

Y_{it} −Dependent variable

β_0 −Intercept /Constant

β − cofficent/slope

$X_{1i\,T}$ – independent variable

ϵ_{It}- Error Term

In this research, the dependent variable of bank profitability measurements dimensions using return on asset (ROA) on the other hand, independent variables of asset quality, capital adequacy and liquidity

ROA = β0+ β1LIQ + β2CA + β3AQ + ε…… 1

Where:

ROA = Return on Assets

LIQ = Liquidity

CA = Capital Adequacy

AQ = Asset Quality

β0 = Intercept/ Constant

β1 – β8 = coefficients of the independent variables

ε = error term

3.8. Definition and measurement of variables

3.8.1. Dependent Variables

3.8.1.1. Return On Asset (ROA*)*

The return on assets (ROA) after taxes and interest is calculated as the ratio of net income to total assets. Total profits for an accounting period are divided by total assets to determine return on assets, or ROA. This ratio assesses the company's capacity to turn a profit while making use of all of its assets. It shows how effectively the company's resources are used to produce profits. Effective use of the company's resources is indicated by a higher ROA, and vice versa (Etim et al., 2020). Profitability is the capacity of a company entity to maintain its earnings over time. The profitability performance of the bank, which contributes to the management's success, is the most significant performance measure for investors. Variations in profitability support economic growth because they impact the choices that businesses make about savings and investments. This is due to the fact that an increase in profits strengthens a company's cash flow position and provides more options for financing corporate initiatives (for example, through retained earnings (Menicucci & Paolucci, 2016).

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

3.8.2. Independent variables

3.8.2.1. Asset Quality

Asset quality is the most important factor in assessing a bank's overall health. The quality of the loan portfolio and the credit administration program are the main factors influencing the overall quality of the asset. The majority of a bank's assets are usually loans, which also represent the biggest risk to the bank's capital. The management of the company's assets, particularly the loan portfolio, frequently requires a large commitment of time, effort, and resources. Problems in this portfolio may make it more difficult for them to profitably and successfully oversee other parts of the organization. Due diligence and concentration are necessary when examining a bank's

assets because they have a substantial influence on the majority of other aspects of bank operations (Wahlen & Wahlen, 1994).

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Asset quality ratio 1: $= \frac{NPLS}{Total\ Loans}$

Asset quality ratio 2: $\frac{Provision\ for\ Loan\ Loss}{Total\ Loans}$

3.8.2.2. capital adequacy

Capital adequacy is a significant element that impacts bank safety. Additionally, it can be thought of as a cushion against potential losses; the larger the cushion, the greater the bank's capacity to withstand losses in the future. Deposits will be far more susceptible, and the bank's capacity to withstand losses in the future will be diminished the smaller the cushion. Deposit exposure will be larger with lower capital levels and greater exposure, which suggests a higher likelihood of bankruptcy. While regulators are conservative entities focused on the safety and soundness of banks and the protection of depositors, banks are risk-averse, rational wealth maximizers(Alzoubi, 2021).

Capital adequacy ratios are a way of comparing a bank's capital to its risk-weighted asset holdings. The process of risk weighting takes into account the influence of off-balance sheet contracts on credit risk as well as the relative riskiness of the various credit exposures that banks have. An increase in a bank's capital adequacy ratio increases its capacity to withstand unanticipated losses before going bankrupt.

(http://www.rbnz.govt.nz/finstab/banking/regulation/0091769.html).

3.8.2.3. liquidity

Liquidity is a collection of cash flows or funds that the bank has available to it that determines its capacity to handle emergency situations and that requires immediate additional funds. Liquidity serves as the bank's safety supervisor and guarantee margin because it is one of the most crucial factors affecting its capacity to obtain additional funds from other banks or the Central Bank. Additionally, it is a critical component in boosting the bank's capacity to draw in more savings and deposits from employees(Al-okdeh, 2022).

The extent to which an entity's current liabilities that must be settled within a single accounting year can be paid off with its entire current asset base without having an impact on its day-to-day operations is known as its liquidity. From a company's liquidity, three ratios can be calculated in general: the cash ratio, current ratio, and quick ratio, also known as the acid test ratio. An entity's liquidity, when managed well, can have a positive short-term impact on the company's solvency and financial performance (Etim, Joel Confidence, 2020).

$$\text{Liquidity} = \frac{Total\ liquid\ asset}{Total\ asset}$$

3.9. Validity and reliability of data

Developing a solid research design, selecting a suitable sample method, and carrying out the study methodically and consistently will determine the validity and reliability of your findings. (Source: https://www.scribbr.com/methodology/reliability-vs-validity)

Purposive sampling, a qualitative research approach, and an explanatory research design will all be used to address the goals of the study and ensure validity and reliability. The audited financial statements of the listed companies provided the study's data, which were judged to be reasonably accurate and trustworthy

3.10 Ethical consideration

Concerns about the definition and construction of the research topic, the design of the study, and the access and collection of data are all covered by research ethics. Research findings are presented in an honest and responsible manner after being processed, stored, and analyzed

(Saunders et al., 2009, p. 184). The secondary data source that was used for this study is quantitative in nature, and it needs to be de-identified before being made available to the researcher. It is reasonable to assume that the study subjects gave their consent. The analysis's conclusion must prevent participants from being re-identified. There must be no negative effects from the data's use.

CHAPTER FOUR

4. DATA ANALYSIS, PRESENTATION AND DISCUSSION

The purpose of this chapter is to analyze and discuss the data that was gathered from secondary sources in order to investigate how asset quality, capital adequacy, and liquidity affect banks' profitability. For the study, a sample of seven banks was chosen. The study's secondary data came from the Central Bank of Ethiopia's annual financial reports for the banks that were included in the sample. The sample consists of seven commercial banks, and ten years' worth of financial data—from 2013 to 2022—was analyzed. Using STATA software, correlation and basic linear regression analysis were used to process the data. A summary of the study analysis's findings concludes the chapter.

4.1. Descriptive Analysis

The variables' mean, minimum, maximum, and standard deviation for the years 2013–2022 were generated and presented in this section. Every variable that was used in the analysis is summarized by the descriptive statistics.

Table4. 1:descriptive statistics for the dependent and explanatory variables

sum roa npl llp ca liq

Variable	Obs	Mean	Std. Dev.	Min	Max
roa	70	0.0234857	0.0102147	0.001	0.07
npl	70	2.845714	0.2580224	2.1	3.4
llp	70	0.0201714	0.0145572	0.002	0.11
ca	70	0.1634286	0.0608606	0.09	0.42
liq	70	16.28843	6.878186	8.78	45.9

Source- research findings 2024.

The ROA has an average value of 0.02% and a minimum and maximum value of 0.001% and 0.07%, respectively. This suggests that the ROA increased steadily over the course of the study period

4.2. Correlation Analysis

One method for determining the degree of linear association between variables is correlation analysis. The correlation coefficient's values are consistently in the range of 1 and -1. A perfect positive association between the two variables is indicated by a correlation coefficient of +1, whereas a perfect negative association is indicated by a correlation coefficient of -1. Conversely, a correlation coefficient of zero denotes the lack of any association or relationship between two variables (Brooks, 2008).

The relationship between the dependent variable, the return on asset (ROA) of commercial banks, and the independent variables, asset quality, capital adequacy, and liquidity, was investigated in this study.

Table4. 2:the correlation analysis ROA with explanatory variables

cor roa npl llp ca liq

(obs=70)

| roa | npl | llp | ca | liq

---

roa | 1.0000

npl | -0.4171 1.0000

llp | - 0.2994 0.1661 1.0000

ca | 0.6794 -0.3599 -0.2483 1.0000

liq | 0.0369 -0.3359 -0.0834 0.2633 1.0000

Source- research findings 2024.

All of the factors have both positive and negative correlations with the dependent variable, as can be seen in table 4.2 above. The correlation coefficient in STATA output is regarded as falling between -1 and 1. The direction of the relationship between the data variables is shown by the correlation coefficient

Return on assets (ROA) is negatively correlated with the two-asset quality measurement ratios, the loan loss provision ratio (LLP) and the non-performing loan ratio (NPL). The relationship between capital adequacy (CA) on return on assets (ROA) is positive

Every variable has an exact correlation with itself, as indicated by the correlations along the intersections of the variables with themselves, which are all 1.0000.

4.3. Regression Analysis

So as to fulfil the goals of this study, which are to ascertain how asset quality, capital sufficiency, and liquidity affect return on assets.

Table4. 3:regression analysis ROA with explanatory variables

In order to examine the impact of asset quality, capital adequacy, and liquidity on bank profitability as hypothesized in the research, a linear regression analysis was conducted.

General model

$$\mathbf{yit}_{=\beta_0} + \boldsymbol{\beta}_{1x_i} + \boldsymbol{\beta}_{2x_2} + \cdots + \boldsymbol{\beta}_K \mathbf{x}_k + \epsilon \mathbf{it}$$

reg roa npl llp ca liq

Source	SS	df	MS	Number of obs	=	70
				F (4, 65)	=	19.99
Model	0.003971469	4	0.000992867	Prob > F	=	0.0000
Residual	0.003228017	65	0.000049662	R-squared	=	0.5516
				Adj R-squared	=	0.5240
Total	0.007199486	69	0.00010434	Root MSE	=	.00705

roa	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
npl	-0.0098236	0.0036705	-2.68	0.009	-0.0171541	-0.0024931
llp	-0.0864275	0.0603817	-1.43	0.157	-0.207018	0.034163
ca	0.1035936	0.0154625	6.70	0.000	0.0727129	0.1344744
liq	-0.0003256	0.0001327	-2.45	0.017	-0.0005906	-0.0000605
_cons	0.0415569	0.0120958	3.44	0.001	0.0173999	0.065714

Source- research findings 2024.

The R-squared value in Table 4.3 is 0.5516, meaning that the independent variables in the model—capital adequacy (CA), liquidity (LIQ), and asset quality (AQ), as measured by non-performing loans (NPL) and loan loss provision (LLS)—explain 55.16% of the return on assets (ROA.

These effects are also justified by the adjusted R-squared value. The coefficient's adjusted R-squared (AR) value is 0.5240, meaning that the independent variable in the model accounts for 52.40% of the variation in the dependent variable.

Regression coefficient (r = 0.0098236, p value=0.009) supports the conclusion that, when loan loss provision (LLP), capital adequacy (CA), and liquidity (LIQ) are held constant, there is a negative and significant relationship between non-performing loans (NPL) and ROA. The reported p-value was less than the crucial p-value of 0.05. Regression coefficient of 0.0098236 indicates that a one unit increase in non-performing loans results in a 0.0098236 unit drop in ROA.

The regression results indicate a negative and negligible relationship between loan loss provision (LLP) and ROA when all other variables (non-performing loan NPL, capital adequacy CA, and liquidity, LIQ) are held constant. The reported p-value exceeded the significant p-value of 0.05. The regression coefficient of 0.0864275 indicates that there is a 0.0864275 unit drop in ROA for every unit increase in loan loss provision.

Capital adequacy (CA) and return on assets (ROA) have a positive and significant relationship when the asset quality (AQ) measurements of non-performing loans (NPL), loan loss provision (LLP), and liquidity ratio are held constant, according to the regression results. This conclusion is supported by a regression coefficient of (r=0.1035936, p-value=0.00). The reported p-value is less than the significant p-value of 0.05. According to a regression coefficient of 0.1035936, there is a 0.1368432 unit increase in ROA for every unit increase in capital adequacy

Holding constant asset quality (AQ) measurements of non-performing loans (NPL), loan loss provision (LLP), and capital adequacy (CA), the regression results show a negative and significant relationship between liquidity (LIQ) and ROA. Regression coefficient (r=0.0003256,

p-value=0.017) supported this conclusion. The p-value that was reported was below the 0.05 critical value. A regression coefficient of 0.0003256 indicates that a one unit increase in liquidity results in a 0.0003256 unit drop in ROA.

4.4. Hypothesis test

Research Hypothesis		Null Hypothesis	Alternative Hypothesis
Ha1: Asset quality has a positive and significant effect on banks' profitability.	ROA	Accepted	Rejected
Ha2: Capital adequacy has a positive and significant effect on banks' profitability.	ROA	Accepted	Rejected
Ha3: Liquidity has a negative and significant effect on banks' profitability.	ROA	Accepted	Rejected

The study aims to investigate the variables that impact commercial banks' profitability, with a particular focus on a subset of Ethiopian commercial banks from 2013 to 2022. Three independent variables—capital adequacy ratio, liquidity ratio, and asset quality as determined by NPL and LLP ratios—are included in the conceptual model of the study, with ROA as the sole dependent variable. Based on information gathered from seven commercial banks and the outcomes of statistical analysis performed with STATA 14.2, the data analysis and discussion will be conducted.

Ha1: Asset quality has a positive and significant effect on banks' profitability.

The regression results indicate that positive and significant relationship between asset quality and ROA. In the regression table the explanatory variable of non-performing loan and loan loss provision ratio explained that they have a negative relationship between them.

The quality of assets is an important indicator to assess the level of financial strength Asset quality is the most important factor in assessing a bank's overall health. The primary determinants of asset quality are the credit administration program and the quality of the loan portfolio. The majority of a bank's assets are usually loans, which also pose the biggest danger to its capital. (Dang, 2011).

The regression study result showed a strong and positive correlation between return on asset (ROA) and asset quality. The explanatory variables of non-performing loans and loan loss provision ratio in the regression table demonstrated their inverse relationship.

According (Gautam et al., n.d.) The allowance or provision for loan losses reserve and the ratio of non-performing loans (NPLs) serve as proxies for asset quality. Because declining credit growth has a negative impact on the country's economic stability, NPL claims that it may be a sign of a banking crisis. The higher the asset quality, the lower the NPL ratio must have(Singh et al., 2021).

According to the correlation and regression analysis results mentioned above, the researcher found that asset quality (AQ) has a positive and significant impact on return on assets (ROA) (Gautam et al., n.d.).

In order to maintain stability and sustainable growth, the primary objective of every banking institution is to operate profitably. However, the presence of high levels of non-performing loans (NPLs) in the banking industry has a negative impact on the level of private investment, impairs a bank’s ability to settle its liabilities when they fall due, and constrains the scope of bank credit to borrowers (Warue, 2013).

According to table 4.3 The regression results indicate a negative and significant relationship between non-performing loans (NPL) and ROA when loan loss provision (LLP), capital adequacy (CA), and liquidity (LIQ) are held constant. Regression coefficient (r =0.0098236, p value=0.009) supports this conclusion. Less than the crucial p-value of 0.05 was the reported p-

value. A regression coefficient of 0.0098236 indicates that a one unit increase in non-performing loans results in a 0.0098236 unit drop in ROA.

The NPL ratio and return on assets (ROA) have a significantly negative relationship, according to the regression analysis, whereas the loan loss provision and ROA have a non-significant negative relationship. Because a lower NPL ratio denotes a higher asset quality, this finding suggests a positive relationship between asset quality and ROA.

A significant and substantial bank accrual known as loan loss provisions (LLP) is applied to reserves to account for potential credit losses on loan portfolios in the future. Because there is always a great deal of subjectivity involved in estimating future loan losses, banks have discretion when determining LLP(Nugroho et al., 2021).

The provision for loan loss (LLP) ratio has a negative and negligible relationship with return on assets (ROA), the researcher found based on the regression analysis. The reported ratio p-value is higher than the crucial p-value of 0.05, which accounts for the relationship's insignificance.

According to table 4.3 When all other variables (non-performing loan NPL, capital adequacy CA, and liquidity, LIQ) are held constant, the regression results show a negative and negligible relationship between loan loss provision (LLP) and ROA. Regression coefficient (r=0.0864275, p-value = 0.157) supports this conclusion. The p-value that was reported exceeded the crucial p-value of 0.05. A regression coefficient of 0.0864275 indicates that there is a 0.0864275 unit drop in ROA for every unit increase in loan loss provision

Ha2: Capital adequacy has a positive and significant effect on banks' profitability.

According to Ayanda and Christopher (2013), posit that insufficient capital is a primary cause of business failure. The researchers found that there is a significant positive correlation between the capital adequacy ratio and return on assets (ROA) based on their regression analysis. This suggests that the profitability of the banking sector is highly impacted by capital adequacy.

Prudent and effective regulation is essential to the creation of a solid and healthy financial system. Capital adequacy is the amount of capital required by a financial regulator for a bank or other financial organization.(Thakur, 2019).

According to table 4.3 When the asset quality (AQ) measurements of non-performing loans (NPL), loan loss provision (LLP), and liquidity ratio are held constant, the regression results show a positive and significant relationship between capital adequacy (CA) and ROA. A regression coefficient of (r=0.1035936, p-value=0.00) supports this conclusion. The p-value that has been reported is below the crucial p-value of 0.05. A regression coefficient of 0.1035936 indicates that a unit increase in capital adequacy results in a 0.1368432 unit increase in ROA.

Ha3: Liquidity has a negative and significant effect on banks' profitability.

Liquidity and return on assets (ROA) have a negative and significant relationship, according to the regression analysis. The bank's reputation may be impacted by the liquidity risk. One important indicator of a bank's capacity to fulfill its financial commitments is its liquidity. Because the reported ratio p-value is less than the crucial p-value of 0.05, this relationship is significant**.**

According to table 4.3 Holding constant asset quality (AQ) measurements of non-performing loans (NPL), loan loss provision (LLP), and capital adequacy (CA), the regression results show a negative and significant relationship between liquidity (LIQ) and ROA. Regression coefficient (r=0.0003256, p-value=0.017) supported this conclusion. The p-value that was reported was below the 0.05 critical value. A regression coefficient of 0.0003256 indicates that a one unit increase in liquidity results in a 0.0003256 unit drop in ROA.

CHAPTER FIVE

5. SUMMARY OF FINDING, CONCLUSION AND RECOMMENDATION

This chapter discussed the summary, conclusion and recommendations of the study.

5.1. Summary of Finding

The study's primary goal was to investigate the variables that influence commercial banks' profitability. Liquidity, capital sufficiency, and asset quality were the study's independent

variables. This was accomplished by looking at a sample of seventy (70) observations between 2013 and 2022.

The Nonperforming Loan (NPL) and Loan Loss Ratio (LLP) establish the asset quality ratio based on our variables. When loan loss provision, capital adequacy, and liquidity are held constant, the NPL ratio significantly and negatively affects return on assets (ROA). This conclusion was supported by the regression coefficient (r = 0.0098236, P-value 0.009). The reported p-value was less than the critical p-value of 0.05. A regression coefficient of 0.0098236 means that the ROA decreases by 0.0098236 units for every unit increase in the NPL ratio.

Loan loss provision (LLP) has a negative and insignificant effect on return on assets (ROA) when non-performing loans (NPL), capital adequacy, and liquidity are held constant. This conclusion is supported by the regression coefficient (r 0.0864275, p-value 0.157), where the reported p-value is higher than the crucial value of 0.05. The regression coefficient shows that there is a correlation between a one unit increase in the LLP ratio and a 0.0864275 unit decrease in ROA.

Return on assets (ROA) is strongly influenced by the capital adequacy ratio, even after controlling for non-performing loans (NPL), loan loss provisions (LLP), and liquidity. This conclusion is supported by a regression coefficient of (r=0.1035936, p-value=0.00). The reported p-value was below the significant p-value of 0.05. With a regression coefficient of 0.1035936, an increase in the capital adequacy ratio of one unit is correlated with an increase in return on assets (ROA) of 0.1039936 units.

Holding constant non-performing loans (NPL), loan loss provisions (LLP), and capital, the liquidity ratio has a negative and substantial impact on return on assets (ROA). This result was corroborated by the regression coefficient (r =0.0003256, p-value 0.017), where the reported p-value was less than the crucial value of 0.05. A regression coefficient of 0.0003356 indicates that for every unit increase in liquidity, ROA decreases by 0.0003256 units.

5.2. Conclusion

The goal of the study was to investigate the variables influencing Ethiopia's commercial banks' profitability. The study took into account measurements of asset quality ratios as independent variables, including the capital adequacy ratio, liquidity ratio, non-performing loan ratio (NPL) and provision for loan loss (LLP). Profitability was determined using return on assets, or ROA, as the dependent variable. The researcher looked at a number of theoretical models and earlier empirical studies concerning the factors influencing commercial banks' profitability.

Based on the results that have been presented thus far, the study concludes that there is a positive significant relationship between asset quality ratio and return on asset (ROA). It also includes the information that nonperforming loans (NPL) have a negative significant effect on ROA and loan loss provision (LLP) have a negative insignificant effect on ROA. Bank loan officers and management should pay serious attention to the health of asset quality in banks in order to improve specifically loans.

The results above indicate that there is a significant positive correlation between return on assets (ROA) and the capital adequacy ratio. The results above indicate that there is a negative and substantial correlation between the liquidity ratio and return on assets (ROA). The reason why liquidity has a negative impact on commercial banks' return on assets (ROA) is because liquid assets make up a small percentage of total assets.

The results above indicate that there is a significant positive correlation between return on assets (ROA) and the capital adequacy ratio.

The study concludes that while liquidity has a negative and significant relationship with Return on Assets, the Asset Quality Ratio (AQ) and Capital Adequacy (CA) have positive and significant effects on Return on Assets.

5.3. Recommendation

The following suggestions were given in light of the regression analysis's results and conclusion. The study found that a bank's return on assets (ROA) is influenced by the capital adequacy ratio, liquidity ratio, and asset quality:

- bank managements should work on, how to minimize their NPL ratios. because having a low NPL ratio means that banks have a better asset quality.
- The bank should select, which variables have powerful effects on return on asset (ROA) and should plan how to minimize the effects.
- The bank should maintain a balance between the amount of liquid assets and total assets in order to increase its return on assets.
- Every bank should give careful thought to the consequences of non-performing loans (NPLs).
- Finally, the study's findings suggest that in order to maintain growth and sustainability, bank management should give careful consideration to the factors of asset quality, capital adequacy, and liquidity.

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APPENDIX

sum roa npl llp ca liq

```
  Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
       roa |        70    .0234857    .0102147       .001        .07
       npl |        70    2.845714    .2580224        2.1        3.4
       llp |        70    .0201714    .0145572       .002        .11
        ca |        70    .1634286    .0608606        .09        .42
       liq |        70    16.28843    6.878186        8.78       45.9

cor roa npl llp ca liq
(obs=70)

             |      roa      npl      llp       ca      liq
-------------+---------------------------------------------
       roa |   1.0000
       npl |  -0.4171   1.0000
       llp |  -0.2994   0.1661   1.0000
        ca |   0.6794  -0.3599  -0.2483   1.0000
       liq |   0.0369  -0.3359  -0.0834   0.2633   1.0000

reg roa npl llp ca liq

      Source |       SS       df       MS      Number of obs   =        70
```

----------+---------- F(4, 65) = 19.99

Model | .003971469 4 .000992867 Prob > F = 0.0000

Residual | .003228017 65 .000049662 R-squared = 0.5516

----------+---------- Adj R-squared = 0.5240

Total | .007199486 69 .00010434 Root MSE = .00705

--

roa | Coef. Std. Err. t P>|t| [95% Conf. Interval]

----------+---

npl | -.0098236 .0036705 -2.68 0.009 -.0171541 -.0024931

llp | -.0864275 .0603817 -1.43 0.157 -.207018 .034163

ca | .1035936 .0154625 6.70 0.000 .0727129 .1344744

liq | -.0003256 .0001327 -2.45 0.017 -.0005906 -.0000605

_cons | .0415569 .0120958 3.44 0.001 .0173999 .065714

---

id	bank name	year	npl	llp	ca	liq	roa
1	AIB	2013	2.6	0.01	0.42	8.78	0.05
1	AIB	2014	2.7	0.01	0.36	9.28	0.07
1	AIB	2015	2.5	0.02	0.31	10.48	0.05
1	AIB	2016	2.6	0.02	0.2	11.88	0.04
1	AIB	2017	2.7	0.01	0.18	12.98	0.03

1	AIB	2018	2.9	0.01	0.15	13.8	0.02
1	AIB	2019	3.1	0.01	0.15	15.2	0.03
1	AIB	2020	2.8	0.02	0.16	16.2	0.03
1	AIB	2021	3.3	0.02	0.14	13.6	0.03
1	AIB	2022	3.2	0.02	0.14	17.5	0.03
2	BOA	2013	2.5	0.02	0.14	23.82	0.03
2	BOA	2014	2.5	0.02	0.27	24.35	0.02
2	BOA	2015	2.4	0.02	0.24	45.9	0.02
2	BOA	2016	2.6	0.01	0.15	18.44	0.02
2	BOA	2017	2.8	0.01	0.13	13.58	0.02
2	BOA	2018	2.8	0.01	0.15	14.04	0.02
2	BOA	2019	3	0.01	0.14	11.38	0.02
2	BOA	2020	3.2	0.01	0.11	11.17	0.01
2	BOA	2021	3.1	0.02	0.09	11.64	0.01
2	BOA	2022	3.3	0.02	0.1	12.36	0.02
3	CBE	2013	2.1	0.02	0.11	10.98	0.03
3	CBE	2014	2.4	0.02	0.1	12.51	0.03
3	CBE	2015	2.7	0.03	0.1	11.03	0.02
3	CBE	2016	2.7	0.03	0.1	10.7	0.02
3	CBE	2017	2.9	0.03	0.1	11.57	0.03
3	CBE	2018	2.9	0.03	0.1	12.87	0.001
3	CBE	2019	2.8	0.04	0.1	11.99	0.02
3	CBE	2020	3	0.05	0.1	11.9	0.01
3	CBE	2021	2.9	0.05	0.1	11.82	0.01
3	CBE	2022	3.1	0.11	0.1	10.9	0.01
4	DB	2013	2.6	0.02	0.15	37.52	0.03
4	DB	2014	2.8	0.02	0.17	33.68	0.03
4	DB	2015	2.4	0.02	0.21	27.34	0.03
4	DB	2016	2.6	0.01	0.21	21.57	0.02
4	DB	2017	2.7	0.01	0.22	18.72	0.02
4	DB	2018	2.9	0.01	0.22	16.07	0.02
4	DB	2019	3	0.01	0.15	14.68	0.02
4	DB	2020	3.1	0.002	0.14	12.81	0.02
4	DB	2021	3.1	0.01	0.12	12.38	0.02
4	DB	2022	3.1	0.01	0.14	14.43	0.02
5	HB	2013	2.6	0.02	0.14	21	0.03
5	HB	2014	2.6	0.01	0.17	28	0.02
5	HB	2015	2.8	0.01	0.14	19	0.02
5	HB	2016	2.7	0.01	0.14	17	0.02
5	HB	2017	2.8	0.01	0.13	15	0.02
5	HB	2018	2.9	0.01	0.12	16	0.02

5	HB	2019	2.9	0.01	0.12	11	0.02
5	HB	2020	3.1	0.01	0.14	12	0.02
5	HB	2021	3.1	0.01	0.13	9	0.02
5	HB	2022	3	0.02	0.12	9	0.02
6	NIB	2013	2.8	0.03	0.23	24.66	0.03
6	NIB	2014	2.7	0.02	0.22	17.83	0.03
6	NIB	2015	2.6	0.02	0.19	13.56	0.03
6	NIB	2016	2.6	0.02	0.19	18.81	0.02
6	NIB	2017	2.7	0.02	0.16	15.61	0.02
6	NIB	2018	2.8	0.02	0.15	14.56	0.02
6	NIB	2019	3	0.02	0.15	13.17	0.02
6	NIB	2020	3.1	0.02	0.13	11.99	0.02
6	NIB	2021	3.1	0.03	0.13	10.78	0.02
6	NIB	2022	3.3	0.03	0.14	9.98	0.02
7	WB	2013	2.9	0.02	0.23	26.7	0.03
7	WB	2014	2.9	0.02	0.25	26.08	0.03
7	WB	2015	2.5	0.02	0.21	17.84	0.03
7	WB	2016	2.9	0.02	0.21	19.13	0.02
7	WB	2017	2.8	0.01	0.2	18.64	0.03
7	WB	2018	2.9	0.02	0.19	14.78	0.03
7	WB	2019	2.9	0.02	0.17	14.38	0.02
7	WB	2020	3.2	0.02	0.16	16.68	0.02
7	WB	2021	3.2	0.04	0.14	12.22	0.003
7	WB	2022	3.4	0.04	0.17	23.94	0.01