

*Addis Ababa  
University*

*(Since 1950)*



**College of Business and Economics  
Department of Accounting and Finance**

**Impact of Asset Liability Management on Profitability: A Case of  
Selected Private Commercial Banks in Ethiopia**

**By:  
Abel Abi**

**Addis Ababa University  
Addis Ababa, Ethiopia**

**JUNE 2021**

**Impact of Asset Liability Management on Profitability:  
A Case of Selected Private Commercial Banks in Ethiopia**

**By:  
Abel Abi**

**Advisor:  
Sewale Abate (PhD)**

**A Thesis Submitted to:  
The Department of Accounting and Finance  
College of Business and Economics**

**Presented in Partial Fulfillment of the Requirements for the Degree of  
Master of Science in Accounting and Finance**

**Addis Ababa University  
Addis Ababa, Ethiopia**

**JUNE 2021**

**Addis Ababa University**  
**College of Business and Economics**  
**Department of Accounting and Finance**

**IMPACT OF ASSET LIABILITY MANAGEMENT ON PROFITABILITY:  
AN EMPIRICAL STUDY ON SELECTED PRIVATE COMMERCIAL  
BANKS IN ETHIOPIA**

**Signed by the examining committee:**

Internal Examiner: **Dr. Abebaw Kassie** Signature \_\_\_\_\_ Date \_\_\_\_\_

External Examiner: **Dr. Giday G.** Signature \_\_\_\_\_ Date \_\_\_\_\_

Advisor: **Dr. Sewale Abate** \_\_\_\_\_ Signatur \_\_\_\_\_ Date \_\_\_\_\_

---

**Chair of Department or Graduate Program Coordinator**

## Declaration

I certify that this work has not been accepted in substance for any other degree, and is not concurrently being submitted for any degree other than that of MSc. being studied at Addis Ababa University. I also declare that this work is the result of my own investigations except where otherwise identified by references and that I have not plagiarized another's work.

Name: Abel Abi

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Place: Addis Ababa University

## **CERTIFICATION**

This is to certify that Mr Abel Abi has carried out this research work on the topic entitled **“Impact of Asset Liability Management on Profitability: A Case of Selected Private Commercial Banks in Ethiopia”** under my supervision. This work is original in nature and it is sufficient for submission for the partial fulfillment for the award of MSc. in Accounting and Finance.

**Dr. Sewale Abate**

Signature.....

Date .....

## **Acknowledgement**

My deepest and warmest thank goes to the Almighty God and His mother Saint Marry, who help me in all aspect of my life, Along with, I would like to express my sincere gratitude to my advisor Dr. Sewale Abate , for his expert guidance, helpful criticism, valuable suggestions and encouragement at every stage during the completion of this work.

My special appreciation also goes to my friends who assisted or encouraged me in one way or another and these include, but not limited to, Birhanu Bekele, Tesfalidet Debuse, and Tigist Bayissa for their excellent comments and suggestions which contributed significantly to my study.

I would like to acknowledge my family for their inspirational advice and support in the process and I add a special note of admiration and gratitude to my friends who have contributed in many ways toward the completion of this thesis. Thank you very much indeed!

# Table of Contents

<b>Contents</b>	<b>Pages</b>
Acknowledgement.....	i
Table of Contents .....	ii
List of Figures .....	v
List of Tables.....	v
Acronyms and Abbreviations.....	vi
Abstract .....	vii
CHAPTER ONE.....	1
1. INTRODUCTION.....	1
1.1. Background of the Study .....	1
1.2. History of Banking System.....	4
1.3 Statements of the problem .....	6
1.4 Objective of the Study .....	8
1.4.1 General Objective .....	8
1.4.2 Specific Objectives .....	8
1.5. Hypothesis of the Study.....	9
1.6. Significance of the Study.....	12
1.7. Scope of the Study.....	13
1.8. Limitation of the study.....	13
1.9. Organization of the Paper .....	14
CHAPTER TWO.....	15
2. LITERATURE REVIEW .....	15

2.1. Theoretical Literature .....	15
2.1.1 An Overview of Asset and Liability Management .....	15
2.1.2 Theories of Asset and Liability Management .....	21
2.2. Empirical Literature Review.....	24
2.2. 1. Empirical Literature in Global Context .....	24
2.2.2. Empirical Literature in Ethiopian Context.....	28
2.3. Conceptual Framework.....	30
CHAPTER THREE.....	31
3. RESEARCH METHODOLOGY .....	31
3.1. Research Design .....	31
3.2. Data Type and Source.....	31
3.3. Method of Sampling and Sample Size.....	32
3.4. Method of Data Analysis .....	33
3.4.1. Descriptive Statistics.....	33
3.4.2. Correlation Analysis .....	33
3.4.3. Regression Analysis.....	33
3.5. Model Specification.....	34
3.6. Measurement of Variables .....	36
3.6.1. Return on Asset (ROA).....	36
3.6.2. Bank Size .....	36
3.6.3. Diversification of Income .....	36
3.6.4. Operational Efficiency .....	37
3.6.5. Asset Quality.....	37
3.6.6. Capital Adequacy .....	37

3.6.7. Investment/ Funding Cost .....	38
3.6.8. Liquidity .....	38
3.6.9. Summary of Variables and their Measures .....	39
3.7. Standards for Decision Making .....	40
3.7.1. Classical linear regression model assumption .....	41
CHAPTER FOUR .....	43
4. DATA ANALYSIS AND DISCUSSION OF FINDINGS .....	43
4.1. Descriptive Statistics .....	43
4.2. Correlation Analysis .....	46
4.3. Model Diagnostics Test .....	47
4.3.1. Test for Multi Collinearity .....	48
4.3.2. Multi-Collinearity Test .....	48
4.3.3. Tests for Heteroskedasticity .....	49
4.3.4. Autocorrelation Test .....	49
4.3.5. Testing for Normality.....	51
CHAPTER FIVE .....	63
5. SUMMARY, CONCLUSION AND RECOMMENDATION .....	63
5.1. Summary .....	63
5.2. Conclusion .....	64
5.3. Recommendation .....	65
References .....	67
Appendix .....	72

## **List of Figures**

Figure 1: Conceptual Framework.....	30
Figure 2 Rejection And Non Rejection for DW Test.....	50
Figure 3 Testing for Normality .....	52

## **List of Tables**

Table 3.1. List of the sample Private commercial Banks.....	32
Table 3.2 Summary of Variables and their Measures .....	39
Table 4.1 Descriptive Statistics .....	43
Table 4.2 Correlation Analysis.....	46
Table 4.3 Test Multi Collinearity .....	48
Table 4.4 Heteroskedasticity Test .....	49
Table 4.5 Correlated Random Effects - Hausman Test.....	53
Table 4.6 Regression result using panel random effect model between leverage dependent variable and six Companies specific independent variables. ....	56
Table 4.7. Comparison of test result with expectation .....	62

## Acronyms and Abbreviations

AIB	Awash International Bank S.C
ALM	Asset Liability management
AQ	Asset Quality
BoA	Bank of Abyssinia S.C
BRIB	Birhan International Bank
BS	Bank Size
BUIB	Buna International Bank
CA	Capital Adequacy
CBO	Cooperative Bank of Oromia S.C
CLRM	Classical Linear Regression Model
DB	Dashen Bank S.C
DW	Durbin Watson
FC	Funding cost
FEM	Fixed Effect Model
ID	Income diversification
LIB	Lion International Bank
LR	Liquidity ratio
NBE	National Bank of Ethiopia
NIB	Nib International Bank S.C
OE-	Operational efficiency
OIB	Oromia International Bank
OLS	Ordinary Least Square
REM	Random Effect Model
ROA	Return on Asset
UB	United Bank S.C
WB	Wegagen Bank S.C

## **Abstract**

*The main aim of the study was to examine the impact of asset and liability management on profitability of selected private commercial banks in Ethiopia for the study period 2010 to 2019. The researcher used explanatory research design to examine the impact of asset–liability management on profitability of selected private commercial banks in Ethiopia. Eleven private commercial banks were selected based on purposive sampling technique, quantitative data collected from each selected private commercial banks, and from National bank of Ethiopia. Profitability was used as dependent variable, whereas. Income diversification, liquidity, bank size, funding cost, asset quality, capital adequacy and operational efficiency .The collected data analyzed using descriptive statistic, correlation analysis and multiple regression analysis with the help of Eviews statistical software. The finding of the study shows that income diversification, liquidity, bank size and funding cost statistically significant and positive effect on banks profitability. On the other hand, variables like asset quality, capital adequacy and operational efficiency has a negative and statistically significant effect on banks profitability. The study revealed that asset quality ratio, operational efficiency, income diversification, liquidity, bank size, capital adequacy and funding cost are the key driver of return on asset of banks, Therefore, Bank managers are advised to give due attention to the significant variables to Improve profitability.*

**Key words: Profitability, Commercial banks, Asset liability Management, Panel data**

# CHAPTER ONE

## 1. INTRODUCTION

### 1.1. Background of the Study

This chapter covers the general idea of the study and categorized in to nine main sections with their sub section. Those are Background of the study, History of banking system, statement of the problem, objectives of the study, general as well as specific objectives, literature driven hypotheses, significances of the study, scope of the study, and limitations of the study and organization of the study.

Charumathi (2008) defines ALM as a dynamic process of planning, organizing, coordinating, and controlling the assets and liabilities; their mixes, volume, maturities, yield, and costs in order to achieve a specified net interest income (NII). In other words, it deals with the optimal investment of assets in view of meeting current goals and future liabilities. It is therefore appropriate for institutions (banks, finance companies, leasing companies, insurance companies, and others) to focus on asset-liability management when they face financial risks of different types.

Asset liability management includes not only a formalization of this understanding, but also a way to quantify and manage these risks. Further, even in the absence of a formal asset liability management program, the understanding of these concepts is of value to an institution as it provides a truer picture of the risk/reward trade-off in which the institution is engaged (Fabozzi and Kanishi, 1991).

The concept of the ALM was developed as a hedging reaction against the risk of financial intermediation. As a discipline, ALM has been functioning since the beginning of 1970s. At the initial stage, the management was based on the simple gap model that analyzes risk in terms of cash flows and the gaps or mismatches between assets and liabilities. As the experiences of financial institutions with risk management evolved, the cash flow gap models gradually gave way to duration gap models, which look more at the market value of the bank's

rate-sensitive assets and rate-sensitive liabilities (to changes in interest rates) rather than just at the difference between them. At present, the rapid development in the ALM field is driven by such forces like: recent growth in the capital markets, advancement in the theory and technology of risk analysis, education of financial intermediaries in the necessity as well as in implementation of ALM.

Profitability is a measure of economic gains realized by a firm in relation to the capital invested. This level of economic success can be determined by the amount of reported profits in a financial year. (Zopounidis, 2001) stated that business environment is characterized by risks and uncertainties, To effectively compete in the market place banks manage their assets and liabilities taking into consideration the risk level, earnings, liquidity, profit, solvency, the level of loans and deposits to mitigate losses and thus improve profitability , Since Asset liability management plays a critical role in risk management, it is imperative that banks recognize the asset liability importance and apply effective risk management procedures, Effective implementation of advanced asset liability management techniques allows banks to hedge the risk and to maximize Profitability in today's highly competitive markets for banking services.

The stability of commercial banks as whole in the economy depends on proper asset liability management structures. Better asset liability management has the tendency to absorb risks and shocks that commercial banks can face. Moreover, asset liability management is the perquisite condition for the efficiency and growth of commercial banks. Asset liability management in commercial banks is determined by the ability of the banks to retain capital, absorb loan losses, support future growth of assets and provide return to investors. For a bank to attain the same objectives then it has to ensure proper asset liability management, including liquidity risk management, interest rate risk management and credit risk management research surveyed by Francis, (2007) .As cited in (Makau & Memba ,2014).

The management of assets and liabilities can be defined as the strategic management of the balance sheet for risk optimization of liabilities and assets taking into account all market risks. Asset liability management is comprehensive and dynamic framework used to measure, monitor and manage the market risk of a bank. It is the management of structure of balance

sheet in such a manner that the net earnings from interest are maximized within the overall risk-preference of the firm, they put forward that asset liability management (ALM) ensures that all the relevant asset and liability classes are managed in an integrated fashion. The values of the assets and the liabilities are influenced by, amongst others, management strategy and economic circumstances. ALM models can be used to show the expected development of an organization, usually measured as solvency and profitability, dependent on both internal (strategy) and external (economy) factors. Angelopoulos et al, (2001).

Asset liability management enables the firm to balance between its liabilities and assets. This in turn minimizes financial risks and hence improves profitability. Asset liability management of the firm guides the management of the firm in making investment decision. This is because the firm is able to allocate sufficient funds for investment as a result of adoption of liquidity management best practices and argue that firms that maintain a proper structure of their balance sheet records high profitability compared to those firms who fail to maintain proper balances of assets and liabilities, This is achieved by effective risk management which play an integral role in addressing financial risk since all risk cannot be eliminated but it is the responsibility of risk managers to identify their risk levels and know which level can be controlled or accepted. (Uyemura and Van Deventer, 2003).

Asset and liability management of bank can be defined as a simultaneous planning and controlling of all asset and liability elements of banks by considering the different objective, market philosophy, computation, legal requirement, managerial and market constraint for the reason of to achieve overall objective by mitigating interest rate risk, by providing liquidity and enhancing the value of profitability of the bank. Kosmidou (2008).

According to Mihail, (2009), the main objective of asset liability management is not simply to eliminate risk. Rather, it is the way so as to manage risks up to stated limits. In setting limits for particular types of risk, a bank should consider its solvency position and its risk tolerance. And Limits should be set after careful consideration of corporate objectives and economic condition, and should take into account the projected outcomes of scenarios. Within these limits, risks can be reduced if this is cost effective, or increased, if justified by the expectation

of improved returns and the availability of additional capital, without endangering the capacity of the bank to meet its commitments to stakeholders.

Thus the researcher believe that asset and liability management is the main activity line of banking industry and proper management of asset and liability can lead the growth of banks and at the same time the growth of economies, by considering this the researcher is interested to examine the impact of asset and liability management on profitability of private commercial banks in Ethiopia.

## **1.2. History of Banking System**

The first financial institution in the world which is bank was established in Venice before 700 years ago. On its establishment it hasn't a function of business bank rather it was began in this way, the republic were in a war and they face shortage of fund, for that reason they required a forced loan. The lender or contributor of that loan was allowed to get four percent of the sum they had been lent. To pay that interest certain branches of public revenue were assigned and the corporation known as chamber of loan was created to manage each branches and to secure on time payment of interest to lender. (Richard, 2001)

According to Richard, (2001) So far there is no standardized bank but sometimes chamber of loan purchase and sell bill of exchange. The chamber generally had some fund on hand thus it had advantageous investment opportunity in the business for buying and selling bill of exchange through time the chamber become regular dealer in that branch of business. That is adopted the business of discount or lending money by mercantile paper. As a result the Venetian merchants getting to the habit of keeping their money with chamber for their security. This habit introduces the business of deposit. Then after the custom was introduced the payment system from the account of payer to receiver, as a result a problem in counting a large number of coin and money was fully avoided. at this time this all activity was performed voluntarily but afterward the law was enforced every merchants to open an account with the bank and all payment of bill of exchange, wholesale transaction was required to be made there. This method of effecting payment was lead to invention of bank note.

The bank of Venice was sole for long, but at the beginning of fifteen century similar institution was established at genoa and Barcelona cities. Afterward a banking industry was expanded to Amsterdam, Hamburg, and then in England then after banking industry was established in all countries across the world including Ethiopia. This narration is in short of the establishment and expansion of banking industry in the world. (Richard, 2001)

When we came to Ethiopian banking history of modern commercial banking in Ethiopian dates back to the turn of the twentieth century when, in 1905, the Bank of Abyssinia was established in Addis Ababa by the agreement between Emperor Minilik II and a representative of British owned National Bank of Egypt. After the bank was bought and owned by the Ethiopian government, it was disintegrated into two different banks forming the National Bank of Ethiopia and the Commercial Bank of Ethiopia (Mauri, 2003).

According to Memmel and Scherteler (2010), traditional perception on such financial intermediaries show a simple logic that a bank accept deposits with short term maturities from a large number of individuals and grants loans with long term maturities to a small number of borrowers. These transformation activities expose a bank to credit, interest rate, and liquidity risks. Commercial banks are among the financial intermediaries that raise funds, as traditionally perceived, primarily by issuing checkable/demand deposits, saving deposits, and time/fixed deposits (Mishikin, 2004). Because the financial system in our country is at its infancy stage, commercial banks are also authorized to provide all the banking service in the financial market. Since there is no organized financial market, almost all of the transactions and activities of money and capital market are carried out by the commercial banks.

As Mishikin (2004) shows, a commercial bank's liability which is mainly financed by current, saving, and fixed deposits and equity (which is contributed by shareholders) represent its sources of funds; while asset which is composed of mainly investments, loans and advances represent its use of funds.

At the time when the imperial regime was falls in 1974 military government took the power and bring a major change in economy policy as a result existing banks were merged in to one government owned bank at this time the development of the economy was adversely affected.

After the downfall of a dergue regime a new era was created to the economy and for the financial system. At that time a law was approved which permit an establishments of private banks as a result a number of private banks increased gradually. Following the new banks legislation in 1990, a number of private owned banks are established, (Geda, 2006)

### **1.3 Statements of the problem**

To cope with the changes in the environment, banking system is essential requirement for economic development. As an important segment of the economy, Banking industry serves as the backbone of the financial sector that accumulates saving from surplus economic units in the form of deposits and provides it to deficit economic units in the form of advances. Banking industry provides support to the economy in general and industries in particular in the time of recessions and economic crisis. (Vossen, 2010).

Notes that sound asset liability management practices create a profitable and conducive environment that enables financial institutions to define strategic asset allocation and to identify financial opportunities and uncertainty in order to improve their financial resources. Asset liability management is relevant to and critical for the sound management of finances of any firm that invests to meet its future cash flow needs and capital requirements and as indicated on (Bhunja, 2010) asset and liability management ensures that the firm is liquid to meet short term obligations of the firm, holding cash gives a safety margin for eventual downturns. Anjili, (2014).

ALM attempts to produce an acceptable risk/reward ratio for a bank because of increased competition and inflationary pressure on the pricing. Since ALM plays a critical role in risk management, it is imperative that banks recognize the ALM importance and apply effective risk management procedures. Effective implementation of advanced ALM techniques allows banks to hedge the risk and to maximize profitability in today's highly competitive industry for banking services. (Zawalinska, 1999).

The profitability of commercial banks is vital for the smooth operation of the financial system of a country (Tektas *et al.*, 2005). In our country, even though the financial sector is regulated as all of other countries financial sector, it is contributing a lion share for the healthiness of the

country's financial system (Francis, 2007). Therefore, the sector's profitability is of the major concern for those who are responsible for policy making and operating day to day with it. Among the possible factors that have effect on commercial banks profitability asset liability management (ALM) is the major one (Kosmidou, 2004; Shubiri, 2010; Sayeed and Hoque, 2008; Asiri, 2007; and others).

According to Hester and Zoellner (1966), there is statistically significant relationship between ALM and profitability and they disregard the null hypothesis that there is no relationship between them. On the contrary, Kosmidou *et al.* (2004) found that liability management plays its own pivotal role in contributing profitability difference among commercial banks. However, before this study Vasiliou (1996) suggests that asset management rather than liability management play the key role in explaining the differences in banks profitability.

Recently, Asiri (2007) found that assets management positively and liabilities management negatively related to the profitability of Kuwaiti banks. Similarly, Belete (2013) found that the profitability of commercial banks is positively affected by assets management, except for fixed assets and is negatively affected by liability management while real growth in GDP and the general rate of Inflation have negative effect on banks profitability.

The above study's findings are incompatible to Ethiopian context because there are economy and policy differences. Whereas limited studies were made in Ethiopia context but still they failed to incorporate necessary variables and their finding is inconsistent too Nitsuh (2017) showed that deposit on other banks, investment, demand deposit, fixed deposit and long term loan has statistically significant and positive effect on commercial banks profitability in Ethiopia. But short term loan has statistically significant and negative effect on profitability of commercial banks in Ethiopia. whereas the finding of (Tamiru, 2013) was , except fixed assets, mainly loans and advances affect profitability positively, while all liabilities mainly saving and fixed deposits and other liabilities and credit balances have significant and negative effect on commercial banks profitability their major difference was on the finding result of liability side variables.. Whereas the other studies made in Ethiopia didn't consider the effects of each asset and liability variables in the profitability of commercial banks rather the main focused of the study were the impacts of risk factors on the profitability of commercial banks by employing

CAMEL approach the typical example is the study of Seblewongel (2017). In addition there is a time gap which create a difference in the finding, such as policy and regulation change in national bank, the typical example is national bank require each private commercial bank to buy government bill from each loan they grant, as a result they may use different way out to hedge a risk therefore the previous research's finding and recommendation may not compatible to the current situation.

Having the above inconsistency and limited finding and also a time gap the researcher is motivated to conduct a study on the impact of asset and liability management on profitability of selected private commercial banks. This study goes further to include other variables influencing profitability with relation to ALM ( asset liability management) targeted factors are capital adequacy, asset quality, operational efficiency, employee efficiency, funding cost , liquidity, income diversification and bank size, their effect on Profitability of selected private commercial banks in Ethiopia Therefore, this paper is intended to fill this gap .

## **1.4 Objective of the Study**

### **1.4.1 General Objective**

The general objective of the study is to investigate the impact of asset and liability management on profitability of selected private commercial banks in Ethiopia.

### **1.4.2 Specific Objectives**

The specific objectives of the study are:

- To evaluate the effect of asset quality, income diversification, investment cost, liquidity, bank size, operational efficiency and capital adequacy on profitability of commercial banks
- To know the relations exists between asset liability management and profitability.
- To find out the extent to which variations in bank size explain the variation in profitability of selected private commercial bank in Ethiopia.

## 1.5. Hypothesis of the Study

Hypothesis of the study stands on the theories related to a bank's profitability that has been developed over the years by banking area researchers and past empirical studies related to a bank's profitability. Hence, based on the objectives, the present study seeks to test the following hypothesis:

**Bank size** is one of the control variables that determine the Profitability of banks, in most literatures the effect of size on banks profitability are represented by total asset. (Ramlall 2009) indicated that size is used to capture the fact that larger banks are better placed than smaller banks in harnessing economies of scale in transactions and enjoy a higher level of profits.

According to Athanasoglou et al., (2005) the effect of a growing size of a bank on profitability has been proved to be positive to a certain extent and used total assets measure of bank size.

H1: There is positive and significant relationship between bank size and bank's profitability.

### **Diversification of Income**

Mihail, (2009) stated that activity diversification leads to increased organizational complexity and the potential for riskier behavior by bank managers. Mentioned that activity diversification results in more complex organizations which make it more difficult for top management to monitor the behavior of the other divisions/branches, they further argued that the benefits of economies of scale/scope exist only to a point. The costs associated with a firm's increased complexity may overshadow the benefits of diversification. Using annual bank level data of all Philippines commercial banks (Sufian and Chong 2008) found a positive relationship between income diversification and bank profitability. And total non-interest income divided by total assets, a proxy for income diversification.

H2: There is positive and significant relationship between diversification of income and bank's profitability.

## **Operational efficiency**

In some papers management efficiency is expressed by operational expense efficiency, poor expense management is expressed poor profitability. So expense efficiency usually used to assess managerial efficiency in banks, the overhead costs of running the bank including salaries and occupancy expense and other expense such as office supplies shows the cost to income ratio this operational cost efficiency shows the management ability to control costs and it is negative relation with profit so when the costs is managed it will increase efficiency therefore it have direct effect on profitability ,the cost to income ratio is used to measure banks operational efficiency the cost to income ratio is calculated by divided the overhead costs (cost of operating ) a bank to the income generated before provision. (Sufian and chong, 2009).

H3: There is negative and significant relationship between operational efficiency and bank's profitability.

## **Asset Quality**

A bank asset is another variable that affect the profitability of banks, loan is the major asset of commercial bank and major source of income, the quality of loan portfolio has direct effect on bank profitability, The highest risk facing a bank is the losses derived from delinquent loans (Dang & Uyen, 2011). Thus, nonperforming loan ratios are the best proxies for asset quality. Different types of financial ratios used to study the performances of banks by different scholars. It is the major concern of all commercial banks to keep the amount of nonperforming loans to low level. This is so because high nonperforming loan affects the profitability of the bank. Thus, low nonperforming loans to total loans shows that the good health of the portfolio a bank. The lower the ratio the better the bank performing (Sangmi & Tabassum, 2010).

H4: There is positive and significant relationship between asset quality and bank's profitability.

## **Capital Adequacy**

According to Dang (2011), the adequacy of capital is judged on the basis of capital adequacy ratio (CAR). Capital adequacy ratio shows the internal strength of the bank to

withstand losses during crisis. Capital adequacy ratio is directly proportional to the resilience of the bank to crisis situations. It has also a direct effect the profitability of banks by determining its expansion to risky but profitable ventures or areas (Sangmi and Nazir, 2010).

H5: There is positive and significant relationship between capital adequacy and bank's profitability.

### **Liquidity**

According to Dang (2011) adequate level of liquidity is positively related with bank profitability. Liquidity indicates the ability of the bank to meet its financial obligations in a timely and effective manner. There are variations among scholars with regard to the measurement ratios. The most common financial ratios that reflect the liquidity position of a bank according to Samad (2004) are customer deposit to total asset and total loan to customer deposits. Other scholars use different financial ratio to measure liquidity. For instance

Ilhomovich (2009. cited in Tesfaye. 2014) used cash to deposit ratio to measure the liquidity level of banks in Malaysia. Based on Tesfaye, in the Ethiopian context liquidity is measured by the liquid asset to deposit ratio in which the National Bank of Ethiopia has set the minimum liquid asset of the Bank not to be less than 15% of the Bank's net current liability. Out of this the directive obliged banks to hold 5% of them in primary reserve assets (see directive no SBB 55/2013).

H6: There is positive and significant relationship between liquidity and bank's profitability.

### **Investment/ Funding Cost**

The interest rate paid by commercial banks for the funds that they deploy in their business, the cost of funds is one of the most important input costs for a financial institution, since a lower cost we generate better returns when the funds are deployed in the form of short term and long-term loans to borrowers. The spread between the cost of funds and the

interest rate charged to borrowers represents one of the main sources of profit for most financial institutions. The most common ratio used to examine funding costs is the ratio of interest expenses and deposits to total deposits. Macroeconomic theory states that there will be a negative relationship between funding costs and profits because a lower cost will generate better returns for banks that make profits off of the loans to borrowers. Dietrich and Wanzenried (2011) find a negative relationship between this ratio.

H7: There is negative and significant relationship between investment cost and bank's profitability.

## **1.6. Significance of the Study**

This study is significant because it dealt with issues of Ethiopian banks are facing and will continue to tackle in the future. In the present scenario, asset liability management is important for the banking industry due to increased importance of managing the asset liability mix; so this study will provide more understanding of the best practices in managing different risks in the banking industry and economic environment. And will help to assess the risks and manage the risks by taking appropriate actions. And also it will provide insights to other firms in the finance sector on how to mitigate risks through ensuring a proper balance between assets and liabilities.

The finding of the study will be useful for different purpose. Mainly it will be useful for managements of commercial banks to know the impacts of asset and liability management on their profitability secondly, it will provide information to shareholders and stake holders to know which asset and liability variable affect profitability weather positively or negatively. Thirdly it will add some finding to the existing literature related to asset and liability management.

This study might contribute and form the basis for further research into the application of innovative asset liability management strategies in banking industry, This can go a long way in coming up with even better and more efficient strategies that are specific to different bank sizes, markets in which they operate and balancing of the different risk appetites that may be

present within the different banks. Generally this study will contribute to the other research on significant of maintaining a proper balance between assets and liability and risk reduction.

### **1.7. Scope of the Study**

The study would be primarily focus on the impact of asset and liability management on profitability of selected private commercial banks in Ethiopia. in order to accomplish the study ten years data use starting from 2010 to 2019 and the data would be collected from only eleven private commercial banks, namely, Awash Bank S.C (AB), Dashen Bank S.C (DB), Bank Of Abyssinia S.C (BOA), Wegagen Bank S.C (WB), United Bank S.C (UB), Nib International Bank S.C (NIB), Cooperative Bank Of Oromia S.C(CBO), Lion International Bank S.C (LIB), Oromia International Bank S.C (OIB), Birhan international bank(BrB) and Buna international Bank, the study would be only limited in the following variables- profitability measured by ROA, Bank size ,Asset quality, Capital adequacy, Funding cost ,Diversification of income, liquidity, and operational efficiency. Finally the collected data would be analyzed by using only descriptive statistic, correlation analysis and multiple regression analysis with the help of Eviews 9 software.

### **1.8. Limitation of the study**

The major limitation of the study was the delay of submission of their financial statement to NBE which means the data for 2019, not submitted until the data collected 2020 and the second limitation was the confidentiality of banks information because when the researcher is tried to get sufficient data regarding asset and liability the results are appear in the financial statement in a consolidated value as a result it was difficult to measure the desired variables as a researcher need.

## **1.9. Organization of the Paper**

The paper would be organized in to six chapters, chapter one introduction and background of the study, statement of the problem, and objective of the study, research question and hypothesis, scope of the study, significance of the study, limitation of the study, organization of the paper. Chapter two will cover both theoretical and empirical literature review. The third chapter would be the methodology of part and includes the research design, data type and data source, sample design, and sample size, data analysis techniques. Chapter four would be indicates the result, chapter five presents the data analysis and discussion of the results. Finally, chapter six presents the major conclusions and recommendation of the research.

## **CHAPTER TWO**

### **2. LITERATURE REVIEW**

A Literature review is the backbone of research in the selection of the appropriate research methodology connected to research topic. It is essential for researchers, as a reader, and for us, as authors, to have a concrete frame of reference in mind before continuing the search journey.

The literature review helps in generating a framework for the study by identifying the important issues in asset and liability management and its theories that are relevant to the study. Therefore, in this section consists of several areas; definition and concept of asset and liability management, theoretical review of asset and liability management, and empirical studies on the asset and liability management on profitability.

#### **2.1. Theoretical Literature**

##### **2.1.1 An Overview of Asset and Liability Management**

ALM can be defined as a technique used by a bank to mitigate a risk arise due to mismatch between asset and liability either due to change in interest rate or by liquidity problem, liquidity is a firm's ability to meet its current obligation by its current asset or it is a firm's ability to meet its liability either by converting asset or by borrowing. The other risk which is change in interest rate arise because of the bank tend to borrow short term and lend long term. Oracle (2008)

Asset and liability management (ALM) deal with an efficient utilization of asset to meet its current goals and to manage its future obligation. The main idea of ALM is about an evaluation of risk and benefits together for asset and liability. Or in a simple term ALM is the continuing process of formulating, implementing, monitoring and revising strategies related to assets and liabilities to achieve an organization's financial objectives, given the organizations risk tolerances level. (Rosen and Zenios, 2006)

The idea of managing risk and benefit is a main issue for different industry out of them banking, insurance, pension funds, and also at the level of individual households. But terminology's of assets, liabilities, and risks are unique to each institution, in general, assets may be viewed as an expected cash inflows, whereas liabilities viewed as expected cash outflows. Although short-term risks arising from the possibility when an institution's assets may not cover its short-term obligations are important to assess and quantify, ALM is usually conducted from a long-term perspective. As such, ALM is considered a strategic discipline as opposed to a tactical one (Choudhry, 2007).

## **Determinants of financial performance of commercial banks**

### **Profitability**

According to Penman (2007), profitability can be defined as the ability of the firm to make profit from its business activities.

Profitability measures the efficiency in the utilization of organizational resources in adding value to the business. Profitability is deemed as a relative term measurable in terms of profit and its relation to other elements that directly influence profitability. According to Srivastava and Srivastava (2006), profitability is the ability of a given investment to earn a return from its use.

Pandy (2005) argues that profit maximization is the fundamental objective of all firms. In a competitive marketplace, a business owner must learn to achieve a satisfactory level of profitability. Increasing profitability involves determining which areas of a financial strategy are working and which ones need improvement. Profitability is a measure of economic gains realized by a firm in relation to the capital invested. This level of economic success can be determined by the amount of reported profits in a financial year. Profitability measures include: ROA (Return on Assets) computed as Net Income divided by Total Assets and ROE (Return on Equity) computed as to Net Income divided by Equity, which is the ultimate measure of economic success.

## **Return on Asset (RoA)**

ROA is the major ratio that indicates the profitability of a bank. It is a ratio of net income to its total asset Khrawish (2011). It measures the ability of the bank management to generate income by utilizing company assets at their disposal. In other words, it shows how efficiently the resources of the company are used to generate the income. It further indicates the efficiency of the management of a company in generating net income from all the resources of the institution Khrawish (2011). Wen (2010), state that a higher ROA shows that the company is more efficient in using its resources.

## **Asset Quality and its Impact on profitability**

The bank asset is another bank specific factor that affects profitability of commercial banks. The bank asset includes current asset, credit portfolio, fixed asset, and other investment. Among these asset component loan has a magnitude share and to discuss the quality of asset loan can be used as a measure because the highest risk in a bank is closely associated with loan. A loan portfolio is a major decision performed by managers to manage the risk associated with asset. The quality of loan has direct relationship with profitability. Thus to measure the quality of asset non-performing loan can be used as a proxy. For every bank the main concern is to reduce a percentage of non-performing loans below the average ratio. The lower ratio implies that the good health condition of banks. (Ongore, 2013).

Asset quality is an implication of liquidation of banks. The highest ratio in NPL means an implication to an increase in bad debt losses and the management of banks should give an attention to maintain credit risk management technique and they have to clearly explain the possible reason for an occurrence of bad debt. In terms of risk poor asset quality is a good implication for reduction in profitability. (Anjili, 2014). Another argument is that when the bank is exercise high growth on loan often because an increase in credit risk thus the direction implies that there is a direct relationship between loan growth and the ratio of non-performing loan. (Koch 1995)

### **Investment/ Funding Cost and its Impact on profitability**

The interest rate paid by commercial banks for the funds that they deploy in their business, the cost of funds is one of the most important input costs for a financial institution, since a lower cost we generate better returns when the funds are deployed in the form of short term and long-term loans to borrowers. The spread between the cost of funds and the interest rate charged to borrowers represents one of the main sources of profit for most financial institutions. The most common ratio used to examine funding costs is the ratio of interest expenses and deposits to total deposits. Macroeconomic theory states that there will be a negative relationship between funding costs and profits because a lower cost will generate better returns for banks that make profits off of the loans to borrowers. Dietrich and Wanzenried (2011) find a negative relationship between this ratio.

### **Operational efficiency and its Impact on profitability**

In some papers management efficiency is expressed by operational expense efficiency, poor expense management is expressed poor profitability. So expense efficiency usually used to assess managerial efficiency in banks, the overhead costs of running the bank including salaries and occupancy expense and other expense such as office supplies shows the cost to income ratio this operational cost efficiency shows the management ability to control costs and it is negative relation with profit so when the costs is managed it will increase efficiency therefore it have direct effect on profitability ,the cost to income ratio is used to measure banks operational efficiency the cost to income ratio is calculated by divided the overhead costs (cost of operating ) a bank to the income generated before provision. (Sufian and chong, 2009).

### **Capital Adequacy and its Impact on Profitability**

Capital adequacy is one element of internal factor that affect profitability of commercial banks. And it is an amount which is own funded or fund contribute from shareholders to support the business and to safeguard the bank in case of any adverse situation and also capital create liquidity because the other source for liquidity which is a most fragile and it doesn't give an assurance of a continuity of banks liquidity. Moreover, greater bank capital reduces the chance of distress (Ongore, 2013) but it doesn't meant that without drawback because if there is a high

capital it leads the management to averse a risk as a result it lead to reduction of revenue or if the bank is highly equity base the management will ignore potential (risky) investment opportunities (Koch, 1995)

Capital is refers to as an amount contributed from owners of a banks to absorb any loses and risk that a banks can face in a day today activity to meet its short term and long term obligation. And also it is the one part which affects banks profitability significantly. Beside the capital of banks are highly regulated because to reduce banks failure it is used as collateral or as a safeguard an assets of banks and it is a measure of financial strength of bank. (Kosmidou, 2009)

### **Diversification of Income and its impact on Profitability**

Senyo,et al (2015) stated that The conventional wisdom in the banking industry is that earnings from fee-based products are more stable than loan-based earnings, and that fee-based activities reduce bank risk via diversification, in fact interest income remains highest contributor to bank Profits non-interest sources of revenue play an augmenting role in times where there are short falls in interest revenue.

Banks are increasingly exploiting nontraditional source of generating income, to the extent that in recent times, almost half of banks' incomes in the US are obtained from nontraditional activities and this reflects not only a diversification of banks into nontraditional activities, but also a shift in the way banks earn money. DeYoung and Rice (2004)

The opposite argument to activity diversification is that it leads to increased agency costs, stated that activity diversification leads to increased organizational complexity and the potential for riskier behavior by bank managers. Mentioned that activity diversification results in more complex organizations which make it more difficult for top management to monitor the behavior of the other divisions/branches, they further argued that the benefits of economies of scale/scope exist only to a point. (Mihail, 2009). The costs associated with a firm's increased complexity may overshadow the benefits of diversification. Using annual bank level data of all Philippines commercial banks found a positive relationship between income

diversification and bank profitability. And total non-interest income divided by total assets, a proxy for income diversification. (Sufian and Chong 2008)

### **Bank Size and its impact on Profitability**

According to Athanasoglou et al., (2005) the effect of a growing size of a bank on profitability has been proved to be positive to a certain extent and used total assets measure of bank size. In the balance sheet, bank assets consist of short and long term in nature. In order to capture possible nonlinear relationship between size and profitability, the use of logarithm of total assets as a proxy for bank size is paramount. The rationale behind this thinking is because large banks are more likely to benefit from economies of scale. In this study it is assumed the bigger the bank size the higher the profitability. Bigger banks in terms of size enable to effectively diversify their assumed risks and respond more quickly to various changes in market conditions. Large firms have the capacity to diversify their investment portfolios and this could reduce their business risks. Large companies generally outperform smaller ones because they manage to utilize economies of scale and have the resources to attract and retain managerial talent. Therefore, it is expected that profitability is positively related with size of company.

### **Liquidity and its impact on Profitability**

Liquidity is characterized by a high level of trading activity. It measures how much cash a company has and how easily it is able to pay its debt. Assets in any firm are categorized into various classes. A firm that holds high amount of cash is likely to take advantage of profitable investments unlike a firm that is illiquid. Credit risk may expose a firm. Liquid assets constitute a significant portion of a firm's total asset (Bourke, 2002). Financial managers pay due attention to the measurement and management of corporate liquidity failure to which may lead to severe shortage of liquidity leading to inability to meet its short and medium term obligations as and when they become due hence financial distress (Uyemura, 1993). Liquidity risk can be measured by two main methods: liquidity gap and liquidity ratios. The liquidity gap is the difference between assets and liabilities at both present and future dates. Liquidity is the amount of capital that is available for investment and spending. Capital includes cash, credit and equity (Bourke, 2001).

### **2.1.2 Theories of Asset and Liability Management**

ALM is simply a practice of managing a business day today operation and making decision so as to utilize a company's resource and increase profitability. And its conducted primarily on the overview of balance sheet thus it involve the management of total balance sheet and it also involve quantification of risk and conscious decision making with regard to asset liability structure in order to maximize the interest earnings within the framework of perceived risks. Sharara (2014). In line with this justification there some theories underlying the revolution of bank assets and liabilities management among theme.

- Liability management theory
- Portfolio theory
- Liquidity preference theory
- The anticipated income theory
- The capital buffer theory
- Commercial Loan theory
- Trade off Theory

#### **Trade off Theory**

Brusov and Filatova (1991) posit that trade-off theory of capital structure refers to the idea that a firm chooses the amount of debt finance and how much equity finance to use by balancing the costs and benefits. Canner et al. (1997) emphasizes that corporations are usually financed partly with debt and partly with equity. The firm has to make a proper match between its assets and liabilities in order to protect itself from financial risks and take advantage of profitable investment opportunities.

According to Brusov (2013), trade-off theory of capital structure basically deals with the two concepts namely; the cost of financial distress and agency costs. The relevance of the trade- off theory of capital structure is to explain the fact the firms are usually financed partly with debt and partly with equity. This means that the firm should make appropriate decisions regarding when to use debt and equity to finance its investment. In so doing, an appropriate match

between assets and liabilities should be maintained to mitigate financial losses and from various risks and loss of investment opportunities.

There are certain benefits that accrue once a firm is financed using debt; the tax benefits of debt. There is a cost of financing with debt, financial distress costs including bankruptcy costs of debt and non-bankruptcy costs for instance staff turnover, suppliers demanding disadvantageous payment terms (Modigliani and Miller, 1958). Brau and Woller (2004) argue that a firm experiences financial distress when the firm is unable to cope with the debt holders' obligations. If the firm continues to fail in making payments to the debt holders, the firm can even be insolvent. With a proper balance of assets and liabilities, the firm is less likely to face challenges of financial distress. The assumption of this theory is that as the marginal benefit of the firm increases the debt declines. Similarly, while the marginal cost increases the firm optimizes its overall value and thus focuses on the tradeoff when choosing how much debt and equity to use for financing.

### **Liquidity Preference Theory**

Jappelli and Pagano, (2002) states that every financial institution should ensure about an ability to pay performance of their borrowers before making any loan disbursement or they has to deeply know about credit worthiness of their borrowers because if they failed to insure about their customers credit worthiness credit risk may exit. And this risk is the main cause for loan default or it's known as non-performing loan. If this risk is happen the financial institution may lose another profitable investment due to lagging of collectability of loan.

(Keynes 1989), was introduce this theory for the first time the main idea of this theory states that investors wants to hold cash unless they want premium for long maturity in other word they want less risk. Because when they invest in highly liquid asset they can simply convert in to cash with a minimum risk. And the demand of cash will be decrease when the interest rate is rise and when interest rate is fall peoples need more money thus the demand of money is depend on interest rate fluctuation.

### **The Anticipated Income Theory**

This theory compares with commercial loan theory which says banks are more profitable when they provide short term loan, by arguing that it is more advisable method for banks to give long term loans as long as the borrower has ability to repay the loan out of future earnings, Under this theory, it is acceptable for banks to engage in a long term lending to businesses, consumer installment loans and amortized real estate mortgage loans. (Soyibo 1994).

### **Portfolio Theory**

According to Markowitz (1952) a portfolio is a collection of different securities such as stocks and bonds that are combined together and considered as a single asset. Or it is in other word the Process of spreading an investment across assets. The matched quote for this theory is don't put all your eggs in a single basket. Combining different securities into portfolios is done to achieve diversification and it is the process of investing a portfolio across different asset classes in varying proportions depending on an investor's time horizon, risk tolerance, and goals.

Canner, (1997), argue that the main aim of this theory is suggesting the firms that they should maintain a proper balance of assets and liabilities to meet their short-term and long-term financial obligation. To maintain this balance, the firm should diversify its asset or portfolio to minimize risks that may cause for financial losses and impact negatively on the Liquidity position of a financial institution. This is important because each asset class Performs differently over time.

### **The Capital buffer theory**

The capital buffer theory states that banks should maintain an excess amount of capital than recommended by the regulatory body. Or in other way capital buffer means holding capital in excess of minimum requirement and the theory implies that if banks have a low capital buffer they have to maximize a capital buffer and they have to reach in a maximum capital buffer point whereas a bank with high capital buffer they have to take appropriate technique to maintain their capital buffer. The reason is having more capital tend to absorb any adverse shock and thus it will reduce a likely occurrence of failure and bankruptcy. (Marcus, 1984)

## **Liability Management Theory**

This theory suggests that commercial banks have to focus only liability part or they shouldn't consider about their asset side like liquid asset and investment and the like. It suggest that they have to focused on the liability side like deposit from customers, Because the main source of their operation is from their liability thus they have to focus on those party. At the same time they may touch both party of the balance sheet. (Emmanuel, 1997)

## **Commercial Loan Theory**

The commercial loan theory, suffers from the fallacy of composition. Such a system can keep one bank liquid, but if all other banks follow this procedure, then the overall liquidity needs will not be met during times of financial crisis. Thus, a credit facility secured by goods cannot be repaid if the goods cannot be sold off, or if the customer takes a loan to buy the goods. The banking system is no more liquid or less liquid than it was before the transaction. In the absence of central bank as lender of last resort and that stands ready to supply needed liquidity to the system as a whole, the real bills doctrine is incomplete. Although commercial loans continue to be an important component of banks asset mix, development of other uses of their funds has caused the operating methods of modern banks to change significantly .(Guthua,2013)

## **2.2. Empirical Literature Review**

### **2.2. 1. Empirical Literature in Global Context**

Moore (2006), did a study to examine the impact of asset and liability management on the financial performance of commercial banks in United Kingdom. An explanatory research design were used to examine the relationship between dependent and independent variables, by taking forty five samples the researcher conclude that there is a positive correlation between asset and liability management with the financial performance of commercial banks listed in the united kingdom.

Tabari (2013) did a study to examine the effects of liquidity risk on financial performance of 15 banks in Iran for the period covering from 2003-2010. He used bank- specific and economic variables, and found that bank's size, bank's capital, gross domestic product and inflation cause to increase in the profitability of bank, while credit risk and liquidity risk will cause to decrease in the bank's profitability. Therefore, the results generally show that liquidity risk will cause to decrease in the performance of bank.

Stierwald (2010), conducted a study on the area of an impact of asset and liability management on profitability of large firms in Australia the research design was descriptive research design and secondary data for five years were collected then the data was analyzed by using regression and correlation technique. The study concluded that there is no positive relationship between asset and liability management with profitability.

Gikonya (2011), Studied the relationship between asset liability management with profitability of commercial bank a cross sectional data were used from secondary data source which are financial statement and other records of banks. But he failed to incorporate the effects of debt to equity ratio or capital adequacy on profitability and financial risk on profitability but keeping hold this limitation after collecting the necessary data the analysis was done by using linear regression model. Finally the study found that asset and liability management has a positive relationship with profitability.

Elsayed (2013) conducted a study on the title of Determinants of profitability of commercial banks in Qatar in the selected eighteen banks for the period covering starting from 2006-2011 he used seven bank specific variables such as capital adequacy, bank size, liquidity, Asset quality, cost efficiency, asset mix, and funding (liability) management. The study were used both conventional banks profitability and Islamic bank profitability. But for this case the researcher only summarize conventional banking profitability. Having that the result shows capital adequacy and cost efficiency have negative impact on the profitability whereas liability management measured as current and saving accounts to total assets, demonstrated positive impact on profitability the remaining variables are measured with Islamic banks profitability.

Darush (2013), Studied the impacts of asset and liability management in the financial performances of Swedish firms. Secondary data from financial statement were used. By cross sectional data design the data were analyzed using descriptive statistic. Then the study found that there is positive correlation between asset and liability management and financial performances of micro firms in Swedish.

Anjili, (2014). Studied the effects of asset and liability management on the financial performances of commercial banks in Kenya, by using a data for ten years from secondary data source. The study was differ from another study by which he used CAMEL approach to determine the effects of ALM on the financial performances of commercial banks those are capital adequacy, asset quality, management efficiency, operational efficiency, and liquidity. The study was descriptive design then the data were analyzed using SPSS software the finding shows that all CAMEL factors had statistically significant impact on financial performance.

Owoputi (2014) Investigated the impact of bank-specific, industry-specific and macroeconomic indicators on bank profitability in Nigeria by using random effect model over the time period from 1998 to 2012, and he found that there is positive and significant relationship between capital adequacy, bank size, productivity growth and deposits with profitability whereas Credit risk and liquidity ratio have a negative and significant effect on bank profits. And also expected, inflation rate and interest rate are negatively and significantly related to bank profitability.

Francis (2014) conducted a study in Influence of Asset Liability Management on Financial Performance of Commercial Banks in Kenya: A Case Study Of Diamond Trust Bank for the period covering 2006-2013 mainly he try to evaluate the influence of customer deposits; loans advanced to customers; and management of loans from other banks in the profitability of the above named bank, by using secondary data which is audited annual financial statement The study concludes that banks should give more emphasis on encouraging to increased customer deposits and the advancement of more loans to customers so as to increase their financial performance.

Sheela (2014) Examine the Effect Of Asset-Liability-Management On Commercial Banks Profitability In Indian Financial Market by considering Two Public Sector Banks namely Union Bank of India and Indian Bank and he believe that asset and liability management is an attempt to match asset and liability based on their maturity and based on their sensitivity to interest rate due to this mismatch interest rate risk and liquidity risk may happen to support this ide he select two nationalized banks they operate in India were selected and the finding shows that there is strong relationship between fixed assets and net worth for both the banks.

Madiri (2015) conducted a study on the area of significance of asset and liability management to liquidity risk which affects profitability of Zimbabwean commercial banks during the period when their banking sectors face a serious liquidity problem and an increase on the NPL due to a dollarization of the Zimbabwean economy in 2009. He used three key variables to assess liquidity risk those are assets and liabilities management policies, contingency funding plans and liquidity stress testing. Finally the study found that there is an existence of positive relationship between liquidity risks of commercial banks and asset liability management policies. And he assured that there is asset and liability management committee who take a responsibility on managing assets and liabilities, maturity gaps and mismatches, structural, static and dynamic gaps liquidity risk and market risks.

Obari (2015), did a descriptive study on the effects of asset and liability management on profitability of commercial banks in Kenya for the year 2010 to 2014 by using secondary data from published financial statement of 44 commercial banks in Kenya. He measure dependent variable which is profitability by ROA and uses as independent variables namely bank size, capital structure and asset and liability management position having these variable he reached a conclusion that there is a statistically significant positive relationship between bank size and profitability and a statistically significant negative relationship between capital structure and profitability. But the main finding of obari that differ from others is asset and liability position has an inverse relationship with profitability of commercial banks.

Evans T (2017) did a study on Asset Liability Management and the Profitability of Listed Banks in Ghana. Random effect model were employed to assess the impact of asset liability management on profitability. Return on asset used as dependent variable whereas the value of

total asset and total liability used as independent variable with macroeconomic variable gross domestic product and interest rate. Finally the result shows that total asset affect profitability of banks positively whereas total liability mainly saving and fixed time deposit affects profitability negatively but macroeconomic variable which is interest rate has no significant effect on profitability.

### **2.2.2. Empirical Literature in Ethiopian Context**

Seblewongel (2017) she did a research in the impacts of asset and liability management on profitability of commercial banks in Ethiopia. 12 year's data were collected from seven commercial banks. ROA was used to measure profitability and independent variables are capital adequacy, asset quality, operational efficiency, liquidity, income diversification and bank size. Finally the study found that liquidity, bank size, income diversification, has positive effect on banks profitability while other variables like asset quality and operational efficiency has a negative impact on banks profitability.

Nitsuh (2017) conducted a research in the effects of asset and liability management on the profitability of selected commercial banks in Ethiopia by taking a sample of eight commercial banks for the period 2005-2014. the research had a quit difference from other studies conducted in this area nitsuh categorize variables in to asset side and liability side variables rather than risk measurement variables and she found that deposit in other banks, investment, demand deposit, fixed deposit and long term loan has statistically significant and positive effect on commercial banks profitability in Ethiopia, Whereas short term loan has negative effect on profitability of commercial banks in Ethiopia.

Tamiru, (2013) did a study on the effects of asset and liability management on the profitability of commercial banks in Ethiopia. The study was conducted for five years by selecting eight commercial banks in Ethiopia. the study found that asset management namely loans and advances has positive relationship with profitability but fixed asset is negatively affected by liability while liability management mainly saving and fixed time deposit, other liability and credit balance has negative impact on profitability of commercial banks.

Fesha B (2018) Conduct a study to investigate determinants of Ethiopian commercial banks by selecting eight commercial banks for the period covering 2005-2016. Fixed effect regression were used to investigate the impact of capital adequacy, bank size, liquidity risk, operating efficiency, management efficiency, employee efficiency , funding cost , foreign exchange rate, inflation and GDP on profitability and the finding shows that capital adequacy, bank size, and gross domestic Product has statistically significant and positive relationship with bank's profitability. On the other hand, liquidity risk, operational efficiency, and funding cost Has a negative and statistically significant relationship with profitability of commercial banks.

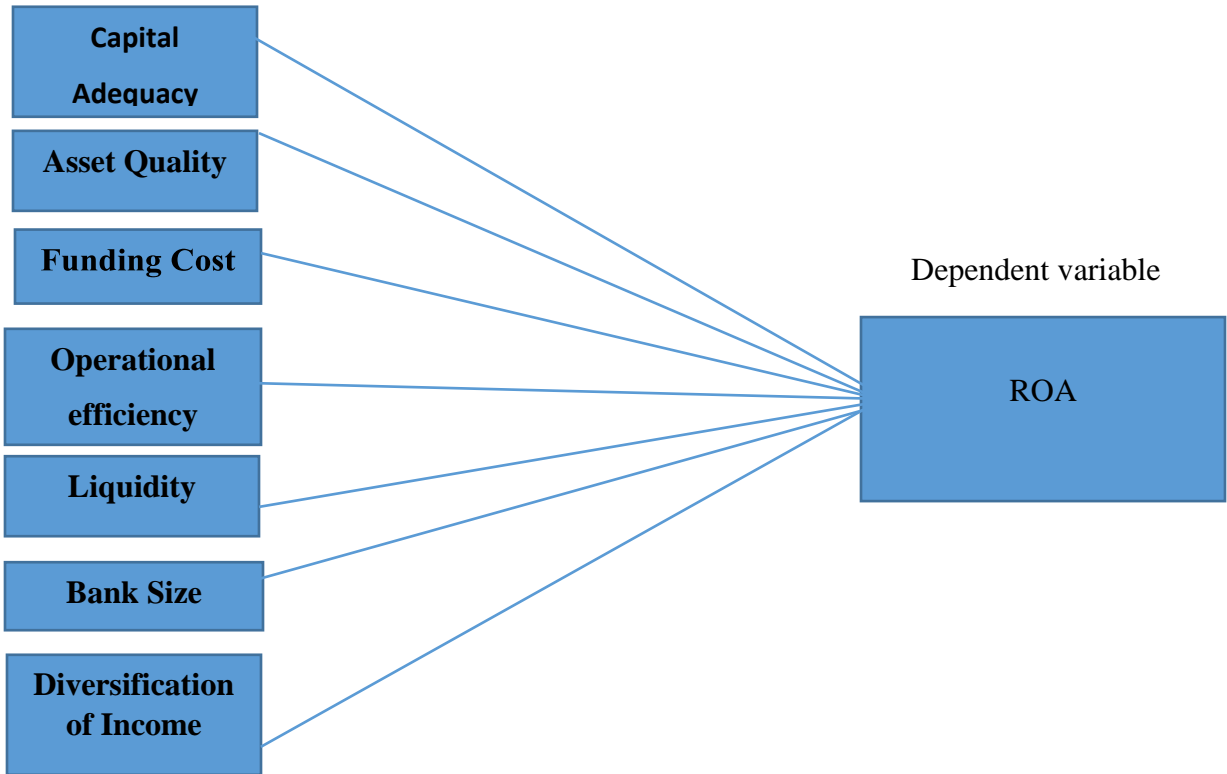
### **Literature summary and Knowledge gap**

It is observed that different theories agreed that asset and liability management is a crucial decision for commercial banks and improper management of asset and liability may adversely affect profitability of private commercial banks. To the best of the researcher knowledge Impact of asset and liability management on the profitability of commercial banks has been studied in the global context by different researchers but their finding is inconsistent with each other. Since their finding is incompatible with our country due to economy and policy difference. When we look at studies made in Ethiopia they are very limited and they are outdated because financial institution policy and regulations are revised periodically and one period result cannot be compatible for the next period therefore it is found that a study on the impact of asset and liability management on profitability is necessary.

### 2.3. Conceptual Framework

From the theoretical and empirical literature reviews, the following conceptual framework of the study is developed by the researcher.

#### Independent variables



**Source:** The concepts, the researcher choose from t theoretical framework Compiled by the researcher.

*Figure 1: Conceptual Framework*

## **CHAPTER THREE**

### **3. RESEARCH METHODOLOGY**

The study aims to conducting a research study to examine the impacts of asset and liability management on profitability of selected private commercial bank in Ethiopia.

In this section the choice of research approach with the way how the data have been collected, Method of Sampling and sample size, Variables descriptions and related Hypothesis, Econometric Model specification and discussion of different measures of both dependent and independent variables are explained.

#### **3.1. Research Design**

Cooper et al. (cite 2003) discussed that explanatory studies unlike descriptive studies, go beyond observing and describing the condition and tries to explain the reasons of the phenomenon. Thus, explanatory research design will be used in this research because the study identifies the cause and effect of impacts of asset and liability management on profitability of selected private commercial bank in Ethiopia which is appropriate for the objective of the study.

#### **3.2. Data Type and Source**

To meet the objectives of this study, the researcher highly spread on secondary source of data. Panel data i.e. annual financial report of 10 selected private commercial bank, covering the period from 2010 to 2019 were using for the study. To increase the reliability of the data using the study and in order to avoid possible distortion of the data, audited financial statements of the companies obtained from National bank of Ethiopia were collecting and using. To further explain the result and master thesis, and materials from different internet sites have been using as a supportive source of data.

### 3.3. Method of Sampling and Sample Size

This study will be conducted on selected private commercial bank, According to National bank of Ethiopia report there are eighteen banks registered, among them development bank of Ethiopia hasn't commercial nature thus commercial banks in Ethiopia are seventeen, out of them one is public commercial bank which is out of the study area. Therefore private commercial banks in Ethiopia are sixteen. By using purposive sampling method ten private commercial banks are selected based on their establishment year, based on data availability and based on their comparative asset structure. Hence the selected banks are Awash Bank S.C (AB), Dashen Bank S.C (DB), Bank of Abyssinia S.C (BOA), Wegagen Bank S.C (WB), United Bank S.C (UB), Nib International Bank S.C (NIB), and Cooperative Bank of Oromia S.C (CBO), Lion International Bank S.C (LIB), and Oromia International Bank S.C (OIB). Birhan bank (BrB).and Buna International Bank. The remaining commercial banks are not covered by this study because their establishment year can't fulfill ten years data. And it is difficult to compare those newly established banks with the oldest and huge commercial banks.

**Table 3.1. List of the sample Private commercial Banks**

S.No	Name of the bank	Year of establishment
1	Awash International Bank	1994
2	Dashen Bank	1995
3	Abyssinia Bank	1996
4	Wegagen Bank	1997
5	United Bank	1998
6	Nib International Bank	1999
7	Cooperative Bank of Oromia	2005
8	Lion International Bank	2006
9	Oromia International Bank	2008
10	Buna International Bank	2009
11	Birhan International Bank	2010

Source: 2018/19 NBE Annual Report ([www.nbe.gov.et](http://www.nbe.gov.et))

### **3.4. Method of Data Analysis**

To achieve the objectives the study, panel data of 10 selected private commercial bank for ten years (2010 to 2019) is using. This is because of that panel data has the advantage of giving more informative data as it consists of both the cross-sectional information, which captures individual variability, and the time-series information, that captures dynamic natures of the data. And hence it ensures more variability, more degrees of freedom, more efficiency, and less collinearity among variables (Gujarati, cite, 2004).

#### **3.4.1. Descriptive Statistics**

When analyzing a series containing many observation it is useful to able to describe the most important characteristics of the series using a small number of summary measure .mean is to measure the central value of the observations. Maximum and minimum using to indicate the highest and lowest values respectively. The standard deviation using to measure the dispersion the values of all the dependent and independent variables. Habtamu, (2019)

#### **3.4.2. Correlation Analysis**

Correlation of individual variable with other variables individually presents numerically quantifying association between them, the direction and strength of relationship between them and with return on asset measures. The correlation coefficient always exists between -1 to +1 where -1 means perfect negative correlation and +1 means perfect positive correlation. 0 means there exists no linear relationship between the variables. Abira Mohsin, (2016).

#### **3.4.3. Regression Analysis**

In this study the regression analysis will be used to examine the impacts of asset and liability management on profitability of selected private commercial bank in Ethiopia and selected independent variables. Multiple regression analysis is adopting when study has one dependent variable which is Return on asset to be a function of more two independent variables which is capital adequacy , diversification of income, funding cost, banks size, liquidity, operational efficiency , and asset quality and therefore it is suitable to achieve the objective of this study. Habtamu, (2019).

### 3.5. Model Specification

According to Wooldridge, cite, (2009), Econometrics is a tool used to estimate economic variables, testing economic theories, evaluating and implementing government and business polices to analyze and test the impact of the independent variables on the dependent variable return on asset ratio, it is appropriate to use econometric tool for this study.

In order to test the research hypothesis and used to test the relationship between variables the model will be developed, according to brook (2008 ) If there are more than one independent variables, the model appropriate to test the significance of these variables to explain about the change on dependent variable would be multiple regression model . In order to achieve the objectives of this study, multiple regression model will be use.

Modeling is based on panel data techniques. Comprises of both cross sectional elements and time series elements; the cross sectional element is reflected by the ten private banks and the time series element is reflected the period of study (2010-2019). Panel data is favored over time series or cross sectional data because it can control for individual heterogeneity and there is a less degree of multi-linearity between variables. (Altai, 2005).

The process of measurement is central to quantitative research because it provides the fundamental connection between empirical observation and mathematical expression of quantitative relationships Brooks, (2008).

According to Brooks, (2008), the general multivariate regression model with K independent variables can be written as follows:-

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \dots + \beta_k X_{ki} + \epsilon_i \quad (i = 1, 2, 3, \dots, n)$$

Where  $Y_i$  is the  $i$ th observation of the dependent variable,  $X_{1i}, \dots, X_{ki}$  are the  $i$ th observation of the independent variables,  $\beta_0, \dots, \beta_k$  are the regression coefficients,

$\epsilon_i$  is the  $i$ th observation of the stochastic error term, and  $n$  is the number of observations. Hence, the effect of asset liability management on Profitability can be model as described below:-

$$\text{ROA} = \beta_0 + \beta_1 \text{CA}_{i,t} + \beta_2 \text{AQ}_{i,t} + \beta_3 \text{OE}_{i,t} + \beta_4 \text{LIQ}_{i,t} + \beta_5 \text{ID}_{i,t} + \beta_6 \text{SIZE}_{i,t} + \beta_7 \text{FC} + \epsilon_i,$$

Subscript  $i$  refer to firm  $i$ , and subscript  $t$  refers to year  $t$ .

Where

ROA= denotes the dependent variable (profitability) measured by Return on asset (net profit before tax /total asset)

CA=Capital Adequacy Ratio (total equity / total asset)

AQ=Asset Quality (loan loss provision /total loan)

OE=operational efficiency (operating cost /operating income)

LIQ=Liquidity ratio (total loan /total deposit)

ID=income diversification (non-interest income /total income)

Bank Size= Natural log of total assets

FC =Investment (Funding cost) = Interest expense /Total Deposit

Where

$\beta_0$  = Constant term

$\beta_1, 2, 3 \dots 7$  are parameters to be estimated;

$\epsilon$  = is the error component for company  $i$  at time  $t$  assumed to have mean zero  $E[\epsilon_{it}] = 0$

$i$  = sampled banks  $i = 1 \dots 7$ ; and  $t$  = the index of time periods.

**Source:** Compiled by the researcher

## **3.6. Measurement of Variables**

### **3.6.1. Return on Asset (ROA)**

ROA is the major ratio that indicates the profitability of a bank. It is a ratio of net income to its total asset Khrawish (2011). It measures the ability of the bank management to generate income by utilizing company assets at their disposal. In other words, it shows how efficiently the resources of the company are used to generate the income. It further indicates the efficiency of the management of a company in generating net income from all the resources of the institution Khrawish (2011). Wen (2010), state that a higher ROA shows that the company is more efficient in using its resources.

### **3.6.2. Bank Size**

Is one of the control variables that determine the Profitability of banks, in most literatures the effect of size on banks profitability are represented by total asset. (Ramlall 2009) indicated that size is used to capture the fact that larger banks are better placed than smaller banks in harnessing economies of scale in transactions and enjoy a higher level of profits.

According to Athanasoglou et al., (2005) the effect of a growing size of a bank on profitability has been proved to be positive to a certain extent and used total assets measure of bank size.

### **3.6.3. Diversification of Income**

Mihail, (2009) stated that activity diversification leads to increased organizational complexity and the potential for riskier behavior by bank managers. Mentioned that activity diversification results in more complex organizations which make it more difficult for top management to monitor the behavior of the other divisions/branches, they further argued that the benefits of economies of scale/scope exist only to a point. The costs associated with a firm's increased complexity may overshadow the benefits of diversification. Using annual bank level data of all Philippines commercial banks (Sufian and Chong 2008) found a positive relationship between income diversification and bank profitability. And total non-interest income divided by total assets, a proxy for income diversification.

#### **3.6.4. Operational Efficiency**

In some papers management efficiency is expressed by operational expense efficiency, poor expense management is expressed poor profitability. So expense efficiency usually used to assess managerial efficiency in banks, the overhead costs of running the bank including salaries and occupancy expense and other expense such as office supplies shows the cost to income ratio this operational cost efficiency shows the management ability to control costs and it is negative relation with profit so when the costs is managed it will increase efficiency therefore it have direct effect on profitability ,the cost to income ratio is used to measure banks operational efficiency the cost to income ratio is calculated by divided the overhead costs (cost of operating ) a bank to the income generated before provision. (Sufian and chong, 2009).

#### **3.6.5. Asset Quality**

A bank asset is another variable that affect the profitability of banks, loan is the major asset of commercial bank and major source of income, the quality of loan portfolio has direct effect on bank profitability, The highest risk facing a bank is the losses derived from delinquent loans (Dang & Uyen, 2011). Thus, nonperforming loan ratios are the best proxies for asset quality. Different types of financial ratios used to study the performances of banks by different scholars. It is the major concern of all commercial banks to keep the amount of nonperforming loans to low level. This is so because high nonperforming loan affects the profitability of the bank. Thus, low nonperforming loans to total loans shows that the good health of the portfolio a bank. The lower the ratio the better the bank performing (Sangmi & Tabassum, 2010).

#### **3.6.6. Capital Adequacy**

According to Dang (2011), the adequacy of capital is judged on the basis of capital adequacy ratio (CAR). Capital adequacy ratio shows the internal strength of the bank to withstand losses during crisis. Capital adequacy ratio is directly proportional to the resilience of the bank to crisis situations. It has also a direct effect the profitability of banks by determining its expansion to risky but profitable ventures or areas (Sangmi and Nazir, 2010).

### **3.6.7. Investment/ Funding Cost**

The interest rate paid by commercial banks for the funds that they deploy in their business, the cost of funds is one of the most important input costs for a financial institution, since a lower cost we generate better returns when the funds are deployed in the form of short term and long-term loans to borrowers. The spread between the cost of funds and the interest rate charged to borrowers represents one of the main sources of profit for most financial institutions. The most common ratio used to examine funding costs is the ratio of interest expenses and deposits to total deposits. Macroeconomic theory states that there will be a negative relationship between funding costs and profits because a lower cost will generate better returns for banks that make profits off of the loans to borrowers. Dietrich and Wanzenried (201 1) find a negative relationship between this ratio.

### **3.6.8. Liquidity**

According to Dang (2011) adequate level of liquidity is positively related with bank profitability. Liquidity indicates the ability of the bank to meet its financial obligations in a timely and effective manner. There are variations among scholars with regard to the measurement ratios. The most common financial ratios that reflect the liquidity position of a bank according to Samad (2004) are customer deposit to total asset and total loan to customer deposits. Other scholars use different financial ratio to measure liquidity. For instance

Ilhomovich (2009. cited in Tesfaye. 2014) used cash to deposit ratio to measure the liquidity level of banks in Malaysia. Based on Tesfaye, in the Ethiopian context liquidity is measured by the liquid asset to deposit ratio in which the National Bank of Ethiopia has set the minimum liquid asset of the Bank not to be less than 15% of the Bank's net current liability. Out of this the directive obliged banks to hold 5% of them in primary reserve assets (see directive no SBB 55/2013).

### 3.6.9. Summary of Variables and their Measures

**Table 3.2 Summary of Variables and their Measures**

<b>Dependent variable</b>	<i>Variables</i>	<i>Definition</i>	<i>Mathematical Expression</i>
	Return on Asset (ROA)	Ratio of Profit before tax to Total asset.	$\frac{\text{Profit before tax}}{\text{Total Asset}}$
<b>Independent Variables</b>	Operational efficiency	Measured with Operating cost to operating income is used as a measure of operational efficiency.	$\frac{\text{Operating cost}}{\text{Operating income}}$
	Funding Cost	Measure the firm is the ratio of interest expense to total deposit.	$\frac{\text{Interest expense}}{\text{Total Deposit}}$
	Size	Measured with a firm's size used in this study is the natural logarithm of its total assets.	$\ln(\text{Total Assets})$
	Diversification of Income	Measured with non-interest income to total income is used as a measure of diversification of Income.	$\frac{\text{Non-interest income}}{\text{Total income}}$
	Asset Quality	Measured with loan loss provision dividing by total loan	$\frac{\text{Loan loss provision}}{\text{Total loan}}$
	Liquidity	Liquidity will be calculated by dividing total loan to total deposit	$\frac{\text{Total loan}}{\text{Total deposit}}$
	Capital Adequacy	Capital adequacy will be calculated by dividing the total equity by the total asset.	$\frac{\text{Total equity}}{\text{Total Asset}}$

### 3.7. Standards for Decision Making

**R squared:** In a multiple regression model, this is the proportion of the total sample variation in the dependent variable that is explained by the independent variable. The closer the R squared is to 1 or 100% the better goodness of fit. The R squared lies between zero and one, because sum of square error cannot be greater than sum of square total. A value of R squared is nearly equal to zero indicates a poor fit of the OLS line (Wooldridge, 2009).

**Adjusted R squared:** a goodness of fit measure in multiple regression analysis that penalize additional explanatory variables by using a degree of freedom adjustment in estimation the error variance.

**T-Statistic:** is used to test a single hypothesis about the parameters in a regression model. When the calculated t-value is less than the tabulated t-value, the parameters is not statistical significant and vice versa. It is the ratio of the estimated parameter to the estimated standard error (Wooldridge, 2009).

**F-Statistic:** a statistic used to test multiple hypotheses about the parameters in a multiple regression model. This statistic tests the null hypothesis that all the regression coefficients are equal to zero. If the F, calculation greater than F, 0.05 (tabulation) we reject the null hypothesis and accept the alternative hypothesis vice versa (Wooldridge, 2009).

**P-Value:** The probability value helps in accepting or rejecting the null or alternative hypothesis. If the P-value is less than or equal to 0.01 (1%) we reject the null and accept the alternative hypothesis at 1% level of significance. If the p-value is less than or equal to 0.05 (5%), we reject the null and accept the alternative hypothesis at 5% level of significance and if the p-value is less than or equal to 0.10 (10%), we reject the null hypothesis and accept the alternative hypothesis at 10% level of significance. (Wooldridge, 2009).

**Durbin Watson (DW) Statistic:** this a statistics used to test for fist order serial correlation in the errors of the regression model under the classical linear model assumption (Wooldridge). It assists in specifying the right combination of the explanatory variables (Gujarati, 2009).

**Multi -Collinearity test:** it is a test to identify either exact linear relationship among the explanatory variables exist or not (Brook, 2008). It assisting in identifying the real impact of each independent variable X on the dependent variable Y. if the correlation between the independent variable greater than 0.07 (Kennedy , 2011) it said to be high multi-collinearity problem exists between the independent variable X.

**Heteroscedasticity test:** used to test to identify either the error terms are Homoscedastic or Heteroskedasticity (Brook, 2008) if the probability F statistics of observed R- square of the white test is excess of 5% then there is no Heteroskedasticity test problem.

**Normality Test:** a test used for checked the normality of the data distribution (Brook , 2008) if Kurtosis of 3 or close to 3 said to be the data is normality distributed in addition if the Jarque-bera test for the model greater than 5% said to be the error terms are normality distributed.

### **3.7.1. Classical linear regression model assumption**

#### **3.7.1.1. Assumption one: The error have zero mean ( $E(\epsilon) = 0$ )**

As indicated Brooks (2008), if a constant term is included in the regression equation, this assumption is not be violated. Hence, this assumption was not violated in the study.

#### **3.7.1.2. Assumption two: homoscedasticity (variance of the errors is constant ( $\text{var}(\epsilon) = \sigma^2 <$**

This assumption stated that the variance of the error is constant, this is known as the assumption of homoscedasticity. If there is errors do not have a constant variance, they are said to be heteroscedasticity. The violation of this assumption is called heteroscedasticity Brooks (2008). In this study heteroscedasticity white test was used to test for the existence of heteroscedasticity across the range of explanatory variable.

### **3.7.1.3. Assumption three: covariance between the error terms over time is zero ( $cov(u_t, u_j) = 0$ for $i \neq j$ )**

This assumption stated that, the covariance between the error terms over time or (cross sectional for that type of data) is zero. In other words, it is assumed that the errors are uncorrelated with one another's it is stated that they are auto correlated or that they are serially correlated Brooks (2008). The study used both Durbin Watson (DW) and Breusch Godfrey test for the existence of autocorrelation.

### **3.7.1.4. Assumption four: Multicollinearity Test**

Brooks (2008), states that an implicit assumption that is made when using the OLS estimation method is that the explanatory variables are not correlated with one another. If there is no relationship between the explanatory variables, they was said to be orthogonal to one another. However, a problem occurs when the explanatory variables are very highly correlated with each other and this problem is known as multi-collinearity.

### **3.7.1.5. Assumption five: normality (errors are normally distributed ( $u_t \sim \mu(0, \sigma^2)$ ) test of normality**

As indicated by Brooks (2008), this assumption requires tests for normality is the Bera Jarque (here after BJ) test. BJ uses the property of normally distributed random variable that the entire distribution is characterised by the first two moments the mean and the variance. The standardized third and fourth moments at a distribution are known as its skewness and kurtosis. Skewness measures the extent to which a distribution is not symmetric about its means value and kurtosis measures how fast that tails of the distribution. A normal distribution is not skewed and it defined to have a coefficient of kurtosis of 3. It is possible to define a coefficient of excess kurtosis, equal to the coefficient of kurtosis minus 3: a normal distribution is thus have a coefficient of excess kurtosis of zero.

## CHAPTER FOUR

### 4. DATA ANALYSIS AND DISCUSSION OF FINDINGS

#### Introduction

Chapter three presented the research method adapted for this study accordingly based on the framework in the previous chapters in this chapters the result and analysis of the data taken from the selected private commercial banks in Addis Ababa, Ethiopian. The study uses the most recent balanced panel data, where a time series segment covering Ten years from 2010-2019 audited financial statement particularly balance sheet and income statements collected directly from the respective national Bank of Ethiopia and cross segment considering 11 private commercial banks with a total of 110 observations. In this study Return on Asset was taken as a dependent variable. Whereas Operational efficiency, Liquidity ratio, Funding cost, Size of the firm, Diversification of income, Asset quality and Capital adequacy. This chapter is organized into five section. section one presents descriptive statistics, section two correlation analysis, section three model specification, section four tests for the classical linear regression model assumptions and section five analysis of results.

#### 4.1. Descriptive Statistics

**Table 4.1 Descriptive Statistics**

	ROA	AQ	CA	FC	ID	LR	OE	SIZE
Mean	0.032519	0.005114	0.144785	0.056317	0.459728	0.620177	4.837569	3.999541
Median	0.033008	0.004013	0.131622	0.028764	0.455095	0.618091	1.108948	4.055816
Maximum	0.064610	0.057174	0.982317	0.659347	0.767031	0.891170	359.6000	4.872945
Minimum	-0.015809	-0.002743	0.041445	0.007731	0.067534	0.404916	-2.073333	2.579235
Std. Dev.	0.011569	0.006755	0.089444	0.113746	0.133131	0.085720	34.28151	0.449622
Observations	110	110	110	110	110	110	110	110

**Table 4.1** measures the mean, minimum, maximum and standard deviation of the dependent variable and independent variables. These variables include profitability, Asset quality, Capital adequacy, and funding cost, diversification of income, liquidity ratio, operational efficiency and Size.

**Profitability (ROA)** -The dependent variable is ROA as indicated in the above table it has a mean value of 0.032519 or 3.2% which implies that Ethiopian private commercial banks are earning on average profit which is measured by net income after tax to average total asset and it has a minimum value of -0.015809 (-1.5%) a maximum value of 0.064610 (6.46%) standard deviation of 0.011569 (1.16%), it implies that for the study period the least profitable bank from selected private commercial bank earn a loss of -1.5% the maximum value shows that a maximum profit recognized during the study period is per each asset is 6.46% whereas the standard deviation implies that on average the profitability of private commercial banks is vary from the mean on average 1.16% it indicate that a low variation from the mean is an implication for the samples are highly associated with the mean. It can be concluded that on average from one birr investment on asset private commercial banks earn a profit of three point two cents.

**Asset quality;** the mean value for asset quality measured by loan loss provision to total loan was 0.005114 (0.51%) with maximum and minimum of 0.057174 (5.72%) and -0.002743 (-0.274%) respectively however the standard deviation is 0.006755 (0.68%) which indicated that there was dispersion from the mean value of asset quality of Ethiopian private banks.

**Capital adequacy;** The mean value for capital adequacy measured by total equity to total asset 0.144785 (14.47%) with maximum and minimum of 0.982317 (98.23%) and 0.041445 (4.14%) respectively the standard deviation is high 0.089444 (8.94%) which means the capital adequacy of the banks vary from bank to bank and from time to time.

**Funding cost;** the mean value for funding cost measured by interest expense to total deposit 0.056317 (5.63%) with maximum and minimum of 0.659347 (65.93%) and 0.007731 (0.77%) respectively the standard deviation is high 0.113746 (11.37%) which indicated that there was a high dispersion from the mean value of asset quality of Ethiopian private banks.

**Income Diversification;** the average value of income diversification measured by non-interest income to total income was 0.459728 (45.97%) with maximum and minimum of 0.767031 (76.70%) and 0.067534 (6.75%) respectively however the standard deviation is high which is 0.133131 (13.31%) which indicated that there was a high dispersion from the mean value of income diversification on Ethiopian sampled private banks .

**Liquidity;** the mean value of liquidity ratio which is measured by loan to deposit ratio was 0.620177 (62.02%) which is above the current minimum regulatory requirement of 15% (NBE Directives No.SBB/57/2014). On the other hand, all the sampled banks are properly maintained the regulatory minimum requirement for the sampled period as their minimum liquidity ratio is 0.404916 (40%). However, the standard deviation is 0.085720 (8.57 %,) it mean that, the liquidity ratio is varying from bank to bank and from time to time within individual bank.

**Operational Efficiency;** The average value of operational efficiency measured by operating cost to total income was (4.837) with maximum and minimum of ( 359.6) and (-2.073) respectively The value of standard deviation (34.28) indicates a high dispersion from the mean value of operational efficiency in the case of Ethiopia private banks .

**Bank Size;** the natural logarithm of total asset was used as proxy for size in the regression model according to the studies of Boyd *et al...* (1993). The result indicates that size is positive and statistically significant to bank profitability. This implies that bank size induces economies of scale there by making larger banks more profitable. Economies of scale will reduce the cost of gathering and processing information. The larger the bank size, the more profitable the bank. It could also mean that bank size is associated with diversification which may impact favorably on risk and product portfolio. The data of this study shows the size of all Ethiopian commercial banks which is measured by log of total asset is increased for the last 10 years consequently. This improvement leads to the profitability of banks in Ethiopia. The result implies that larger banks enjoy the higher profit than smaller banks in Ethiopia banking sector because they are exploiting the benefit of economies of scale. The mean of the logarithm of total assets during the period was (3.99). Having the maximum and minimum of (4.872) and (2.57) respectively and also there is relatively some variation in the size of the commercial banks in Ethiopia as the standard deviation is (0.44).

## Correlation analysis and its discussion

As noted in Brooks (2008), Correlation between two variables measures the degree of linear association between them. Values of the correlation coefficient are always ranged between positive one and negative one. A correlation coefficient of positive one indicates that a perfect positive association between the two variables; while a correlation coefficient of negative one indicates that a perfect negative association between the two variables. A correlation coefficient of zero, on the other hand, indicates that there is no linear relationship between the two variables. The most widely used bi-variant correlation statistics is the Pearson product movement coefficient, commonly called the Pearson correlation, the result of the correlation analysis is shown in Table 4.2 . It indicates a relationship between Profitability and bank size, income diversification had positive relationship; capital adequacy, asset quality, operational efficiency and liquidity ratio and Funding cost have negative relationship with banks profitability.

### 4.2. Correlation Analysis

**Table 4.2 Correlation Analysis**

	ROA	AQ	CA	FC	ID	LR	OE	SIZE
ROA	1.000000							
AQ	-0.158418	1.000000						
CA	-0.164849	-0.023958	1.000000					
FC	-0.055217	-0.113618	-0.076233	1.000000				
ID	0.361968	0.031501	0.009701	-0.457188	1.000000			
LR	-0.079480	0.220104	0.144379	0.031649	-0.479527	1.000000		
OE	-0.306811	0.110561	-0.052029	-0.044108	0.109708	0.216250	1.000000	
SIZE	0.027724	-0.135605	-0.187490	0.335679	-0.652995	0.379693	-0.071744	1.000000

## **Correlation analysis results and discussion between the dependent variable and each independent variable**

This section is designed to show the result of correlation analysis between dependent variable profitability of private commercial banks (ROA) and that of independent variables OE, FC, CA, ID, AQ, LR, and Size, the result shows that, there is ROA is positively correlated with ID, Size and negative association with OE, FC, CA, AQ, and LR, Which means when the increase in these factors leads in the decrease in profitability. Moreover, the coefficient estimates of correlation in the above table shows, (-0.158418) for Asset quality, (-0.164849) for Capital adequacy, (-0.306811) for operational efficiency, (-0.055217) for Funding cost and (-0.079480) for liquidity ratio these implies that the correlation in these independent variables with the dependent variable is low. While income diversification (ID) and bank size (Size) is positively related with profitability. This means when the increase in these factors also leads to an increase in profitability of Ethiopian banks, in conclusion, there is no perfect correlation between dependent and independent variables as there is no 1 or -1 correlation between variables.

In general, even though the correlation analysis shows the direction and degree of associations between variables, it does not allow the researcher to make cause and affect inferences regarding the relationship between the identified variables. Thus, in examining the effects of selected independent variables on Profitability of banks the econometric regression analysis which is discussed in the forthcoming section of the paper gives assurance to overcome the shortcomings of correlation analysis.

### **4.3. Model Diagnostics Test**

The aim of model diagnostics test is that to test and contain statistically significant explanatory variables and to test either the classical linear regression model assumptions violated or not , thus if the data fits the basic assumption results since it enhance the reliability of the regression input and output on hand. Based on these aim the common diagnostics test was done, accordingly below each of the test are presented as follows:

### 4.3.1. Test for Multi Collinearity

**Table 4.3 Test Multi Collinearity**

	ROA	AQ	CA	FC	ID	LR	OE	SIZE
ROA	1.000000							
AQ	-0.158418	1.000000						
CA	-0.164849	-0.023958	1.000000					
FC	-0.055217	-0.113618	-0.076233	1.000000				
ID	0.361968	0.031501	0.009701	-0.457188	1.000000			
LR	-0.079480	0.220104	0.144379	0.031649	-0.479527	1.000000		
OE	-0.306811	0.110561	-0.052029	-0.044108	0.109708	0.216250	1.000000	
SIZE	0.027724	-0.135605	-0.187490	0.335679	-0.652995	0.379693	-0.071744	1.000000

### 4.3.2. Multi-Collinearity Test

The basic aim of testing multi-collinearity is that to test the situation where there is either an exact or approximately exact linear relationship among the explanatory variables (Brook, 2008). According to (Kennedy, 2011) the variables to be valid the correlation result between two variables shouldn't be greater than **0.7**, if the multi collinearity problem occurred the estimates of the sample parameters become inefficient and causes large standard error, which makes the coefficient values and signs unreliable .it also hides the real impact of each variables on the dependent variable (Brooks, 2008). High degree of multi collinearity can result in both regression coefficients being inaccurately estimated, and difficulties in separating the influence of the individual variables on the dependent variables. When we look at table of multi-collinearity, in this study no any variable correlation matrix exceeds **0.7** between the independent variables. The maximum correlation observed was **0.3796** located on between

Liquidity ratio and Bank Size and fairly low correlation among variables. Thus, there is no problem of multi-collinearity in this study which confirm the reliability of the regression analysis.

#### 4.3.3. Tests for Heteroskedasticity

The basic assumption of this test is that the error terms are homoscedastic, in other words assumed that the error terms have constant variance. If the error terms have no constant variance in this case said to have Heteroskedasticity problem and the presence of Heteroskedasticity makes the standard error too big or low and hence any inferences made could be misleading. There are different methods to test Heteroskedasticity but the most popular methods is the white test .According to ( Brooks ,2008) if the probability of F-statistics ,observed R-square and scaled explained SS of the Heteroskedasticity white test results in excess of 5% then there is no Heteroskedasticity problem . Thus, for this study the white test of Heteroskedasticity applied in order to confirm either these test assumptions were violated or not. According to as shown in table Heteroskedasticity test below both F – statistics and chi-square version of the test statistic give the same conclusion that there is no evidence for the presence of Heteroskedasticity, since the P-value was considerably in excess of 0.05 that 0.0958.

**Table 4.4 Heteroskedasticity Test**

Heteroskedasticity Test: White

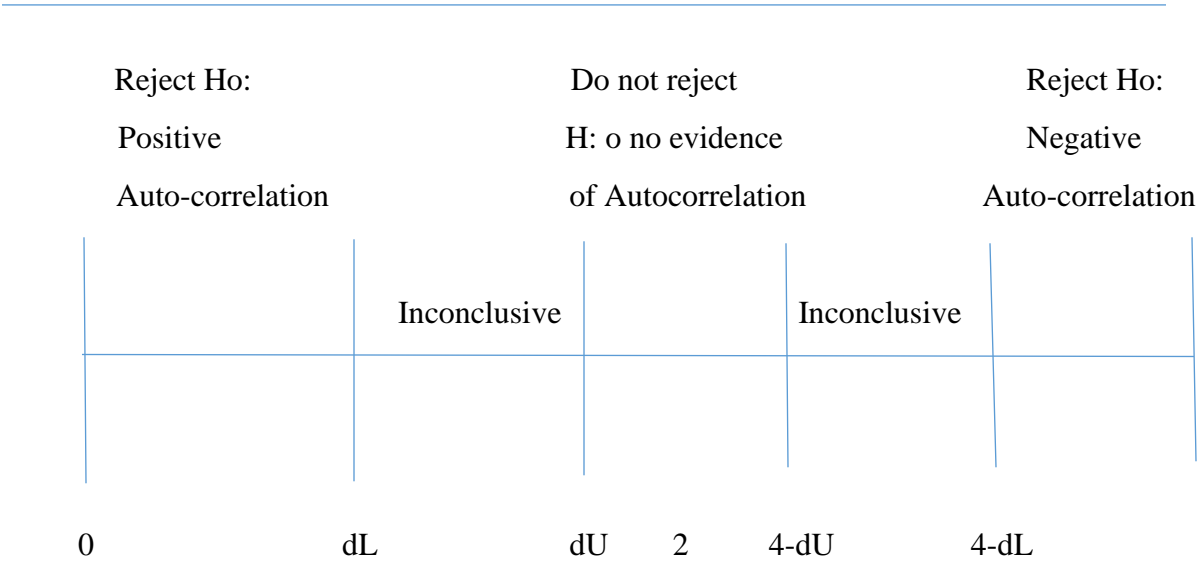
F-statistic	1.614136	Prob. F(35,74)	0.0529
Obs*R-squared	47.62201	Prob. Chi-Square(35)	0.0756
Scaled explained SS	46.30366	Prob. Chi-Square(35)	0.0958

#### 4.3.4. Autocorrelation Test

Autocorrelation test that can be used to check whether the error are uncorrelated each other thereby to assure whether the model was in line with the fourth assumption that required not serially correlated error terms. The Durbin Watson or DW test in order to detect the problem of

autocorrelation. As per Brook (2008), DW test is a valid test until three condition are met. First, there must be a constant term in the regression equation. Secondly, the explanatory variables of a model must be not correlated with the error terms. Thirdly, in order to use a DW as a valid test for autocorrelation is that three must be no lags of the explained variable in the equation. The model used for the purpose of this study met the above three conditions .as a result, DW test was used to detect autocorrelation. As Brook (2008) stated, the non -rejection region for a DW test is between the Upper limit (I,e.  $d_U$  ) and 4 minus the Upper limit (i,e.  $4-d_U$ ) . More specifically if DW is equal or near to 2. On the other hand, if the DW stat falls between  $d_L$  and 0, the null hypothesis of no autocorrelation is to be rejected in favor of positive autocorrelation. If DW falls between  $4-d_L$  and 4, the null hypothesis of no autocorrelation will be rejected in favor of negative autocorrelation of residuals. However, if the DW stat result is between the Upper critical value  $d_U$  and the lower critical value  $d_L$ , the null hypothesis of no autocorrelation will neither be rejected nor not rejected. The DW stat value from the random effect regression output of this study as presented shows that 1.8 which is near 2 so, we do not reject the null hypothesis because there is no evidence of autocorrelation.

***Rejection and Non-Rejection Regions for DW Test***



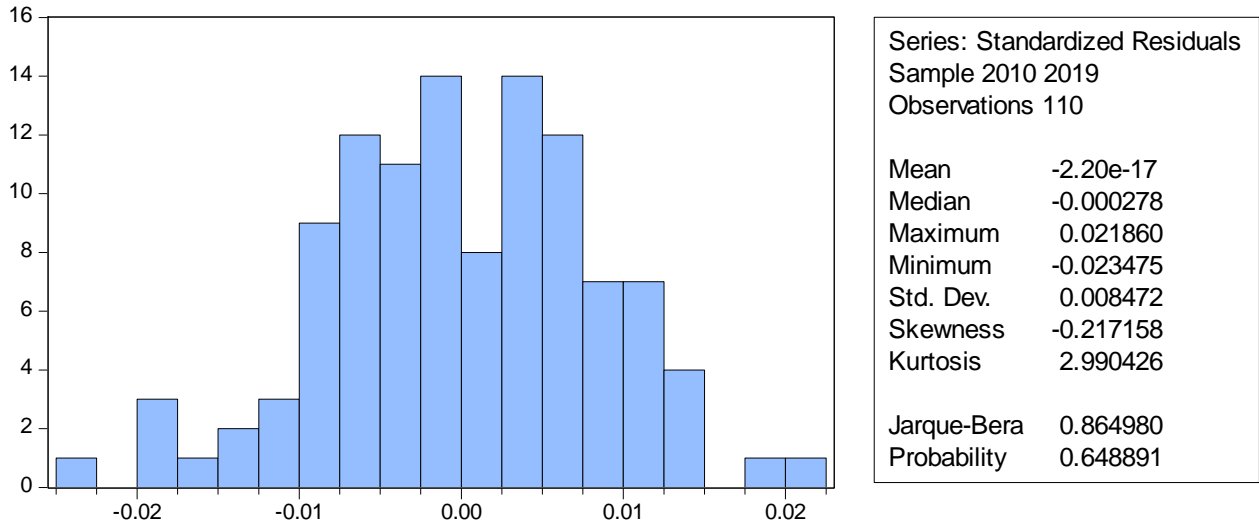
*Figure 2. Rejection And Non Rejection for DW Test*

### Autocorrelation test: Durbin Watson

Variables DW test static result	1.8656
---------------------------------	--------

#### 4.3.5. Testing for Normality

The assumption of the normality test is the mean of the residuals is zero. According to (Brook , 2008) the normality of the data can be checked with the popular Jarque-Bera test statistics and its corresponding Kurtosis, Kurtosis measure the skewness of the data at hand, the data distribution either it can be skewed to the left and right , kurtosis with value 3 highly preferred and the ball shaped is the standard. The null hypothesis is that 5% significant level we failed to reject the null hypothesis  $H_0$  where there is no problem of normality. In short if the P-value of the test greater than 5% we do not reject the null hypotheses and we said the data is normally distributed and the kurtosis of 3 or closer to 3 we said the data have normal distribution. Accordingly, in this study based on normality test table state below the P-value was of 0.86 it implies that the P-value for the Jarque -Bera test for the model is greater than 5% which indicates that the errors are normally distributed. In addition, the kurtosis was 2.99 it indicates close to 3 which is also acceptable and confirm the data was normally distributed.



*Figure 3 Testing for Normality*

## Model Specification

To run regression using panel data according to (Brooks, 2008) there are broadly two classes of panel estimator approaches available, that can be employed in the financial research. These are Fixed Effect Model (FEM) and Random Effect Model (REM). Both approach out came has similarly with slight difference. According to Gujarati (2009) if T (the number of time series data) is large and N (the number of cross-section units) is small, there is likely to be little difference in the values of the parameters estimated by Fixed Effect Model and Random Effect Model. Hence, the choice here is based on computational convenience. Since the number of time series (i.e, 11 years) is greater than the number of cross-sectional units (i.e. 10 Private commercial bank) the random effect model is preferred. However the intercept for each cross-sectional unit are assumed to be arise from a common intercept  $\alpha$  (which is the same for all cross-sectional units and over time), plus a random variable  $\mathcal{E}i$  that varies cross –sectional but is constant over time.

## The Random Effect Model

An alternative to the fixed effects model described above is the random effects model, which is sometimes also known as the error components model. As with fixed effects, the random effects approach proposes different intercept terms for each entity and again these intercepts are constant over time, with the relationships between the explanatory and explained variables assumed to be the same both cross-sectional and temporally. However, the difference is that under the random effects model, the intercepts for each cross-sectional unit are assumed to arise from a common intercept  $\alpha$  (which is the same for all cross-sectional units and over time), plus a random variable  $\varepsilon_i$  that varies cross-sectional but is constant over time.  $\varepsilon_i$  measures the random deviation of each entity's intercept term from the 'global' intercept term  $\alpha$ . (Brooks, 2008).

**Table 4.5 Correlated Random Effects - Hausman Test**

Correlated Random Effects - Hausman Test

Equation: Untitled

Test period random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Period random	0.000000	7	1.0000

In order to test validity of the above assumption there by to choose appropriate model for the study, a Hausman Test was carried out by the researcher. Table .... Presents the Hausman specification test which suggests the random effect model was better than fixed effect model as the P-value (1.0000) is greater than 0.05 for dependent variables which implies that fixed effect model should be rejected and thus, the analysis is based on the random effect estimators.

## Result of regression analysis

So far in this chapter analysis was done regards to descriptive statistics, correlation coefficient, model diagnostic test, and model selection tests. Now the final section of this chapter presented

the empirical econometric regression result regarding to the subject of this study i.e the effect of company's specific factors on Profitability (RoA) of Private commercial bank in Addis Ababa, Ethiopia. Thus, Table 4.3 below report the regression results between the dependent variable Profitability (RoA) and the independent variable: Asset quality, Liquidity ratio, Funding cost, Operational efficiency, Bank Size, Income diversification and Capital adequacy Based on presented criteria of decision in the methodology selection of this study below a detail analysis and discussions presented to evaluate ether the regression results in line with the standard criteria or not. Therefore, R-square result, Adjusted R-squared result, T –test, P-value, F-stat and DW- statistic value of table 4.3 evaluated as follows:

**R-squared value:** As indicated in table 4.3 below the R-squared value was 0.48 it implies that the proportion of the total sample variation in the dependent variable that is explained by the independent variables was 0.48 and the remaining 0.52 was not explained by the model. The decision rule was that the closer the R-squared is to 1 or 100% the better the goodness of the fit. A value of R-squared lies between zero and one. A value of R- squared that is nearly equal to zero indicates a poor fit of OLS line (Wooldridge, 2009). Thus the conclusion is the R-squared value was close to 1 i.e, was 0.48 thus have better goodness of fit.

**Adjusted R-squared value:** The adjusted R-squared as indicated in table ... was 44.7% it measures the goodness of fit after penalize additional explanatory variables by using a degree of freedom adjustment in estimating the error variance. This value indicates that collectively the change in companies specific factors explain 44.7% of dependent variable Profitability (RoA). Hence it can be said the variables company's factor the Profitability (RoA) of private commercial bank in Addis Ababa, Ethiopia and the remaining 55.3% was determined by factors not included in this model and still it confirm the goodness of fit.

**T-statistics value:** The T-statistic value t-statistic is used to test a single hypothesis about the parameters in a regression model. When the calculated t-value is less than the tabulated t-value, the parameters is not statistical significant and vice-versa. It is the ratio of the estimated parameters to the estimated standard error (Wooldridge, 2009). This explained more in section on hypothesis testing.

**F-statistics value:** The joint F statistics probability of this study was 0.0000 and the statistic tests criteria the null hypothesis that all the regression coefficients are equal to zero. If the Fcal

greater than F, 0.05 (table), we reject the null hypothesis and accept the alternative hypothesis vice versa (Wooldridge, 2009). based on the decision criteria as I have mentioned on the methodology section the probability of F- stat 0.0000 confirm that overall or jointly significant (Wooldridge,2009).

**P-value:** The decision rule is the P-value is less than or equal to 0.01(1%), we reject the null hypothesis and accept alternative hypothesis at 1% level of significance. If the P- value is less than or equal to 0.05(5%), we reject the null hypothesis and accept the alternative hypothesis at 5% level of significance. and P- value is less than or equal to 0.10(10%) , we reject the null hypothesis and accept the alternative hypothesis at 10% level of significance (Wooldridge , 2009).

Accordingly, the P-value of independent variables, Asset quality (AQ) with P-value 0.0023 and Capital adequacy (CA) with P-value 0.0000, Liquidity ratio (LR) with P- value 0.0000, Funding cost, (FC) with P- value 0.0000 , Income diversification(ID) with P- value 0.0000, Operational efficiency (OE) with P-value 0.0000 respectively was at 1% significant level but Size (Size) P-value of 0.0632 was significant at 10% significant level.

**Durbin Watson (DW) Statistic:** this a statistics used to test for fist order serial correlation in the errors of the regression model under the classical linear model assumption (Wooldridge). It assists in specifying the right combination of the explanatory variables (Gujarati, 2009). Based on the test the DW test result was 1.86 almost nearly 2 and confirm was no autocorrelation problem thus it can be concluded that the explanatory variable combination was right for this study.

**Table 4.6 Regression result using panel random effect model between leverage dependent variable and six Companies specific independent variables.**

Dependent Variable: ROA  
 Method: Panel EGLS (Period random effects)  
 Date: 04/05/21 Time: 14:16  
 Sample: 2010 2019  
 Periods included: 10  
 Cross-sections included: 11  
 Total panel (balanced) observations: 110  
 Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
AQ	-0.277036	0.088763	-3.121096	0.0023
CA	-0.023641	0.004936	-4.789228	0.0000
FC	0.018447	0.003903	4.726374	0.0000
ID	0.077201	0.008234	9.375602	0.0000
LR	0.051319	0.006169	8.319589	0.0000
OE	-0.000151	7.52E-06	-20.08088	0.0000
SIZE	0.008086	0.004306	1.877948	0.0632
C	-0.062610	0.021448	-2.919122	0.0043

Effects Specification		S.D.	Rho
Period random		0.000000	0.0000
Idiosyncratic random		0.008057	1.0000

Weighted Statistics			
R-squared	0.483143	Mean dependent var	0.032519
Adjusted R-squared	0.447673	S.D. dependent var	0.011569
S.E. of regression	0.008598	Sum squared resid	0.007540
F-statistic	13.62096	Durbin-Watson stat	1.865601
Prob(F-statistic)	0.000000		

Unweighted Statistics			
R-squared	0.483143	Mean dependent var	0.032519
Sum squared resid	0.007540	Durbin-Watson stat	1.865601

This part focuses mainly on the result of the regression analysis for the selected input variables for this study that have an impact on selected private commercial bank Profitability ratio(RoA) in light of the hypothesis developed the research objective and research question developed in and the theories summarized of the literature review. The selected input factors was Asset quality , Capital adequacy , Liquidity ratio, Funding cost ,Income diversification ,Operational efficiency and Size with the dependent variable Profitability ratio(RoA) and discussed one by one as follows.

H1: There is positive and significant relationship between bank size and bank's profitability.

The **Size** of the firm affects its Profitability in many ways. Large firms can exploit economies of scale and scope and thus being more efficient compared to small firms. Larger bank can achieve operating cost efficiencies through increasing output.

Company size is computed as logarithm of total assets of banks. The regression result of this study show that the variable size has positive coefficient (0.008086) and p value (0.0632) related to Profitability that means if the size of the company increase by one unit , ROA will also increase by (0.008086) unit considering that other independent variables remain constant. It also statistically significant (p-value=0.0632) at a 10% level of significance. This indicates that large volume of total asset has a significant effect on private banks financial performance. because large bank normally have greater capacity for dealing with adverse market fluctuations than small banks and have more economies of scale, complex information systems and better expenses management. The finding is consistent with (Obari, 2015), and Large firms are more likely to manage their working capitals more efficiently than small firms. According to Owoputi (2014) , Fesha B (2018) ,and Seblewongel (2017), most large firms enjoy economies of scale and thus are able to minimize their costs and improve on their financial performance. Hence, this study supports the hypothesis that bank size has a positive and significant effect on Profitability of commercial banks' in Ethiopia.

H2: There is positive and significant relationship between diversification of income and bank's profitability.

The coefficient of income diversification which is measured by non-interest income to total income was (0.077201) and p value (0.0000) which means statistically significant at 1% of significant level holding other independent variable constant at their average value when income diversification increases by one profitability of the sampled private banks will increase by (7.72%) Indicating that the more banks generate their revenue from different activities, the more their Profitability becomes better. The random effect regression output also the same with the expected hypothesis as income diversification has positive and significant impact on Ethiopian private banks financial performance. So, this study supports the hypothesis that income diversification has a positive and significant effect on Profitability of commercial banks' in Ethiopia.

The finding of the study is consistent with portfolio theory argue that Markowitz (1952), Combining different securities into portfolios is done to achieve diversification and it is the process of investing a portfolio across different asset classes in varying proportions depending on an investor's time horizon, risk tolerance, and goals.

Canner, (1997), argue that To maintain this balance, the firm should diversify its asset or portfolio to minimize risks that may cause for financial losses and impact negatively on the Liquidity position of a financial institution. This is important because each asset class Performs differently over time.

Other empirical findings on previous studies Seblewongel (2017), also were found a positive relationship between Profitability ratio (RoA) and income diversification. Hence, our study findings positive relationship between Profitability ratio (RoA) and income diversification. So the result or findings is consistence.

H3: There is negative and significant relationship between operational efficiency and bank's profitability.

Operational efficiency, the expected result and relationship with profitability ratio (RoA) was negative relationship. The regression result in above table indicates also was -0.000151 with P-value 0.0000 which confirm there is negative relationship between operational efficiency and profitability ratio (RoA) .it implies that when operational efficiency of the selected private

commercial bank increased by one percent, profitability ratio (RoA) decreased by 0.015, other factors remain constant. The coefficient of operational efficiency has a P-value of 0.0000 and statistically significant at 1% statistical level which confirms also selected private commercial bank operational efficiency has highly impact on determining profitability ratio (RoA).

The finding of this study is matching with Fesha B (2018), Seblewongel (2017) and Elsayed (2013) also were found a negative relationship between Profitability ratio (RoA) and Operational efficiency. Hence, our study findings negative relationship between Profitability ratio (RoA) and operational efficiency. So the result or findings is consistent.

H4: There is positive and significant relationship between asset quality and bank's profitability.

As the above table shows that the coefficient of asset quality was (-0.277036) with the respective p value (0.0023) which is statistically significant at 1% of significant level, Holding other independent variables constant at their average value, when asset quality (loan loss provision /total loan) increases by one, profitability (ROA) of sampled Ethiopian private banks will decrease by (27.7%) and statistically significant at 1% of significant level. This means banks which fail to monitor their credit loans tend to be less profitable than those which pay particular attention to assets quality. The finding of the study is matched with Kosmidou (2008) applied a linear regression model on Greece 23 commercial banks data for 1990 to 2002, using ROA and the ratio of loan loss reserve to gross loans to proxy profitability and asset quality respectively. The results showed a negative significant impact of asset quality to bank profitability

Therefore the study fails to reject the hypothesis stated that Asset quality has a positive and significant effect on Profitability of commercial banks' in Ethiopia.

Dang & Uyen, (2011), a bank asset is another variable that affects the profitability of banks, loan is the major asset of commercial bank and major source of income, the quality of loan portfolio has direct effect on bank profitability, The highest risk facing a bank is the losses derived from delinquent loans .

Sangmi & Tabassum, (2010), it is the major concern of all commercial banks to keep the amount of nonperforming loans to low level. This is so because high nonperforming loan affects the profitability of the bank. Thus, low nonperforming loans to total loans shows that the good health of the portfolio a bank. The lower the ratio the better the bank performing

H5: There is positive and significant relationship between capital adequacy and bank's profitability.

As the above random effect regressions model is presented the coefficient of capital adequacy measured by total equity over total asset is (-0.023641) and its p value is (0.0000). Holding other independent variables constant at their average value, when capital adequacy (total equity/total asset) increases by one, profitability (ROA) of sampled Ethiopian private banks will decrease by 2.36% and statistically insignificant at 1% of significant level. Therefore, the study reject the hypothesis that capital adequacy has a positive and significant effect on Profitability of commercial banks' in Ethiopia, This means, there is no sufficient evidence to support the positive relationship between capital adequacy and profitability.

According to capital buffer implies that: if banks have a low capital buffer they have to maximize a capital buffer and they have to reach in a maximum capital buffer point whereas a bank with high capital buffer they have to take appropriate technique to maintain their capital buffer. The reason is having more capital tend to absorb any adverse shock and thus it will reduce a likely occurrence of failure and bankruptcy.

H6: There is positive and significant relationship between liquidity and bank's profitability.

The coefficient of liquidity which is measured by total loan and advance to total deposit was (0.051319) and p value (0.0000) which means statistically significant at 1% of significant level, Holding other independent variables constant at their average value when liquidity increase by one profitability of the sampled private banks will increase by (5.13%) These results provide reasonable evidence to the consistent view that, the higher the liquidity, the better the financial performance. This supports the claim that banks which are illiquid are forced to borrow from the market expensive funds or to prematurely liquidate their long term investments at unfavorable bargains to cover immediate cash need thus reducing financial

performance. Therefore the study stated Liquidity has a positive and significant effect on Profitability of commercial banks' in Ethiopia.

According to Dang (2011) adequate level of liquidity is positively related with bank profitability. Liquidity indicates the ability of the bank to meet its financial obligations in a timely and effective manner.

H7: There is negative and significant relationship between funding cost and bank's profitability.

The coefficient of liquidity which is measured by total loan and advance to total deposit was (0.018447) and p value (0.0000) which means statistically significant at 1% of significant level, Holding other independent variables constant at their average value when funding cost increase by one profitability of the sampled private banks will increase by (1.844%) These results provide reasonable evidence to the consistent view that, the higher the funding cost, the better the financial performance Therefore, the study reject the hypothesis that funding cost has a negative and significant effect on Profitability of commercial banks' in Ethiopia. This means, there is no sufficient evidence to support the negative relationship between funding cost and profitability.

Other empirical findings on previous studies. Fesha B (2018), also were found a negative relationship between Profitability ratio (RoA) and funding cost. Hence, our study findings positive relationship between Profitability ratio (RoA) and funding cost. So the result or findings is inconsistency.

**Table 4.7. Comparison of test result with expectation**

Independent Variables	Expected Relationships with profitability (ROA)	Actual result	Statistical Significance test
Asset quality	+ Significant	-Significant	- Significant at 1%
Operational Efficiency	-Significant	- Significant	- Significant at 1%
Funding/investment cost	- Significant	+Significant	+Significant at 1%
Income diversification	+ Significant	+Significant	+Significant at 1%
Liquidity ratio	+Significant	+ Significant	+ Significant at 1%
Capital adequacy	+ Significant	-Significant	-Significant at 1%
Bank Size	+ Significant	+ Significant	+ Significant at 10%

From the above data analysis, Ethiopian banks performance is highly affected by all variables included in this study, The findings of the study showed that asset quality, operational efficiency and capital adequacy have statistically significant at one present level of significance and negative relationship with Ethiopian banks financial performance. However, variables bank size; funding cost, liquidity, and income diversification have a positive and statistically significant at one present level of significance relationship with Profitability of banks in Ethiopia.

In general managing asset liability of a bank should goes hand to hand with each other and balancing accordingly is a mandatory, the study concludes that there is a strong relationship between asset liability management and Profitability of banks in Ethiopia as explained by the model variables explanatory power adjusted R-Square was 44%, which means ROA of private banks of Ethiopia is explained by the selected variables .and 55 % is explained by other than the studied variables.

## CHAPTER FIVE

### 5. SUMMARY, CONCLUSION AND RECOMMENDATION

#### 5.1. Summary

The main objective of the study was to examine the impact of asset and liability management on profitability of private commercial banks in Ethiopia. The study was carried out by using secondary data from financial statements which are collected from national bank of Ethiopia and each sample private commercial banks annual report during the period of 2010-2019. To achieve the main objective, descriptive statistics, diagnostic tests, selection of appropriate model, multiple regression result and test of hypothesis have been run using statistical package data of “EViews 9”. The appropriate model that has selected for this study since the diagnostic test of all assumptions are valid and met, as a result it is possible to conclude that the model is adequate, statistically good fit, and data’s were represented reliably. to carried out the study Return on asset was taken as dependent variable to measure profitability and seven independent variables are used these are asset quality, operational efficiency , capital adequacy, funding/investment cost, liquidity ratio, income diversification , and bank size. Random effect model was used to show the variables which are affect profitability of private commercial banks in Ethiopia weather positively or negatively.

Before running a regression the model was checked against five classical linear regression model assumptions those are Zero mean assumption, heteroscedasticity assumption, autocorrelation assumption, Multicollinearity assumption and the normality assumption. The model passed all the above linier classical model assumptions.

Descriptive analysis result shows the capital adequacy mean value was 0.1447 (14.47%) that was above the required standard of 0.0894 (8.94%), which means the total asset of private banks in Ethiopia were financed by shareholders contribution while the remaining (85.53%) were financed from deposit. the average value of asset quality was 0.0051 (0.51%). it indicates private banks Provide consistent provision to manage credit risk of the bank. The mean of operational efficiency was on average (4.83) Ethiopian private banks spend on average (4.83)

percent of their revenue for operation expense; the average value of liquidity was (62%) which is above the minimum standard of (8.5%) This indicates (62%) of the deposit of Ethiopian private banks converted in to loan, the average value of income diversification was (45.97%) ,also the mean of bank size was (3.99) and the mean of funding cost was 0.056317(5.63%). With regard to the relationship between the selected variable to profitability measures of Return on Asset (ROA) Capital adequacy, asset quality and operational efficiency had negative relation with the return on asset of banks and positive relation with income diversification and liquidity ratio, funding/investment cost and bank size, These indicate that Capital adequacy, asset quality and operational efficiency ratio had inverse relation with the ROA. But liquidity, income diversification, funding/investment cost and bank size had direct relation with ROA, liquidity, income diversification , Operational efficiency, bank size, funding/investment cost, asset quality and operational efficiency was significant at 1%. As to the explanatory power of the regression output 44 % of the change in the return on asset can be explained by the selected variable. Generally, the study finds that all factors related to ALM significantly affect Ethiopian private banks profitability for the last 10 years.

## **5.2. Conclusion**

The study revealed that capital adequacy, asset quality, operational efficiency, funding cost, liquidity ratio, income diversification and bank size were the most influential factors of Ethiopian banks ROA based on the result the researcher concluded that the main factors affect the ROA of, capital adequacy, asset quality, operational efficiency, funding cost, liquidity ratio, income diversification and bank size since they have statistically significant impact at confidence level of 99%.

In general managing asset liability of a bank should goes hand to hand with each other and balancing accordingly is a mandatory, the study concludes that there is a strong relationship between asset liability management and Profitability of banks in Ethiopia as explained by the model variables explanatory power adjusted R-Square was 44%, which means ROA of private banks of Ethiopia is explained by the selected variables .and 55 % is explained by other than the studied variables.

### 5.3. Recommendation

Based on the findings of the study the following possible recommendations were forwarded, The study revealed capital adequacy, asset quality, operational efficiency, income diversification, funding /investment cost ,liquidity and bank size are the key driver of return on asset of banks, Therefore, Bank managers are advised to give due attention to the significant variables to Improve profitability.

- ❖ On the basis of the findings of the study the researcher recommends that profitability in commercial banks can be achieved by; For asset quality banks need to improve their processes of screening credit customers and monitoring of credit risk .This is an important indicator because banks have had serious problem with non-performing loans in the past which led to collapse of many banks.
- ❖ Capital adequacy of banks should focus on improving their capital levels in order to improve their profitability. This will enable the banks, not only to be cushioned against exogenous shocks, but also to take full advantage of business opportunities
- ❖ In terms of operational efficiency, it is obvious that a lot needs to be done to expenses in the banking sector to improve financial performance. The strong negative impact of operational efficiency indicates that banks are not able to manage operating cost. In order to survive and adapt to the changing environment, poor expense management is expressed poor profitability. So expense efficiency usually used to assess managerial efficiency in banks, the overhead costs of running the bank including salaries and occupancy expense and other expense such as office supplies shows the cost to income ratio this operational cost efficiency shows the management ability to control costs.
- ❖ It is better to have a diversified income source i.e. is a collection of different securities such as stocks and bonds that are combined together and considered as a single asset. Or it is in other word the Process of spreading an investment across assets. Combining different securities into portfolios is done to achieve diversification and it is the process of investing a portfolio across different asset classes in varying proportions depending on an investor's time horizon, risk tolerance, and goals. And also Ethiopian private banks can improve their fee based income by introducing innovative products and services to make them best financial performer.

- ❖ In terms of funding cost is one of the most important input costs for a financial institution, since a lower cost we generate better returns when the funds are deployed in the form of short term and long-term loans to borrowers. Banks should increase their cost volume with putting in mind that as some times banks become larger they might suffer on inefficiencies and this leading to lower financial performance, In view of the research findings, a significant positive relationship. So the management of banks should give an attention to maintain funding cost management technique and they have to clearly explain the possible reason for an occurrence of cost. In terms of risk poor cost control is a good implication for reduction in profitability.
- ❖ As it has shown on the regression analysis result, liquidity ratio has a positive and significant impact on profitability of private commercial banks in Ethiopia. Accordingly, the private commercial banks should maintain optimal liquidity level to solve its financing problem and to invest their fund on productive investment area.
- ❖ In terms of the bank size banks should increase their asset volume the lower is the risk of bankruptcy, sometimes banks become larger they might suffer on inefficiencies and this leading to lower financial performance, In view of the research findings, a significant positive relationship is evident between bank size and levels of selected private commercial banks Profitability so Policy makers should endeavor to put in place policies that smaller commercial banks have to be competitive and stable so as to promote further financial performance.
- ❖ Finally, this study is the impact of asset liability management on profitability (RoA) of private commercial banks in Ethiopia Therefore; the researcher would like to recommend future researchers to include the impact of macroeconomic factors variables such as GDP, inflation related, government regulation and policy in order to obtain reliable results.

## References

- Angelopoulos, P. and Mourdoukoutas, P. (2001). *Banking Risk Management in a Globalizing Economy*, Greenwood Publishing Group, Westport, CT
- Anjili, D. A. (2014). Effects of asset and liability management on the financial performance of commercial banks in Kenya, School of Business, University of Nairobi.
- Athanasoglous P. et al., (2005). Bank-Specific, Industry- Specific and Macroeconomic Determinants of Bank Profitability, Bank of Greece Working paper, No. 25.
- Belete, T. (2013). Asset Liability Management and Commercial Banks Profitability in Ethiopia, *Journal of Finance and Accounting*, 4, 10, 2222-1697.
- Bhunja, A. (2010). A trend analysis of liquidity management efficiency in selected private sector Indian steel industry, *International Journal of Research in Commerce and Management*, 1(1),1-5.
- Bourke, P. (2001). Concentration and other determinants of bank profitability in Europe, North America and Australia. *Journal of Banking and Finance*, 1(2)1-7.
- Brooks, C. (2008). *Introductory Econometrics for Finance* 2nd Ed. United Kingdom: Cambridge University Press.
- Brooks, C. (2008). *Introductory Econometrics for Finance*, 2nd ed., Cambridge University Press, New York.
- Brusov, P., Filatova, T., & Orekhova N. (2013). Absence of an optimal capital structure in the famous trade-off theory, *Journal of Reviews on Global Economics*, 2, 94-116.
- Canner, N. Gregory, M. &David, N. (1997). *An asset allocation puzzle*. The American Economic Review, 87 (1): 181–191.

- Charumathi, B. (2008). *Asset Liability Management in Indian Banking Industry; with special reference to Interest Rate Risk Management in ICICI Bank*, World Congress on Engineering, July 2 – 4, London, UK.
- Cooper and Schendlar, C. D. (2003). *Business Research Methods*. (8th, Ed.) New York: McGraw-Hill/Irwin.
- Darush, Y. (2013). Asset liability management micro firms: evidence from Swedish data, *International Journal of Managerial Finance*, 9(2), 151 -160.
- Dr. Elsayed Elsiefy (2013). Determinants of profitability of commercial banks in Qatar *International Journal of Economics and Management Sciences*. Vol. 2, No. 11, 2013, pp. 108-142
- Emmanuel,N.R, (1997). *Commercial Banking in an Era of Deregulation*, Greenwood Publishing Group, 3rd Ed
- Evans T (2017). Asset Liability Management and the Profitability of Listed Banks in Ghana IOSR. *Journal of Economics and Finance (IOSR-JEF)* Volume 8, Issue 3 Ver. IV (May - June 2017), PP 09-14
- Fesha B. (2018). Determinants of profitability of commercial banks in Ethiopia Addis Ababa University College of Business & Economics Department of Accounting and Finance.
- Francis, M. E. (2007). Determinants of Banks' Profitability in Sub-Saharan Africa, *Journal of International Finance* 88, 26–51.
- Geda, A. (2006). Structure and Performance of Ethiopia's financial sector in the pre & post reform period: with special focus on banking, Research paper no. 2006/112, Addis Ababa University.
- Gikonya, S. W. (2011). The relationship between asset-liability management and profitability of Commercial banks in Kenya, Unpublished MBA project, University of Nairobi.

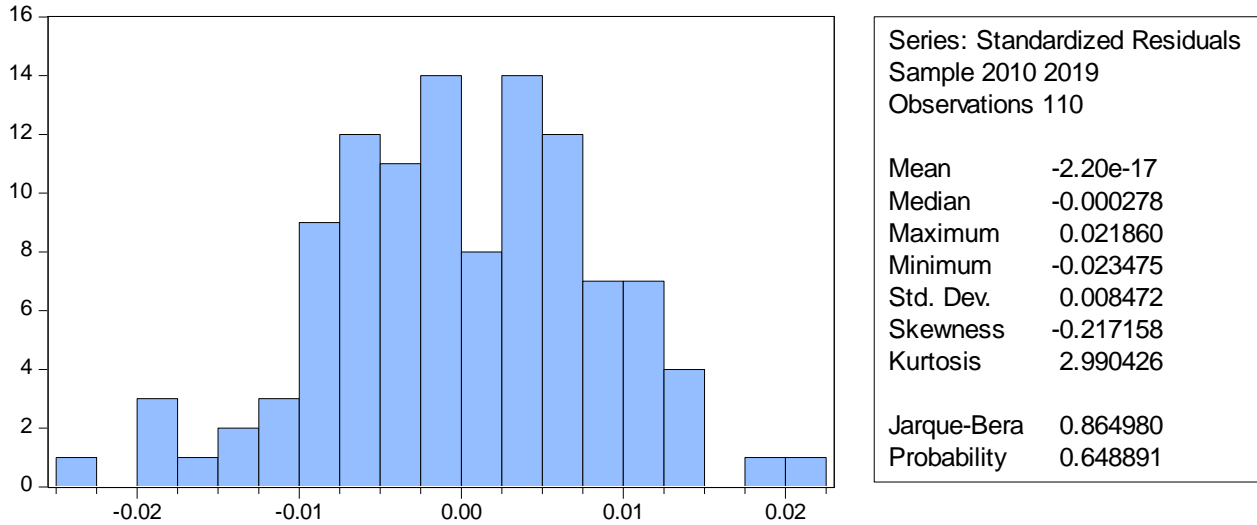
- Gujarati, D. (2004). *Basic Econometrics*, 4th ed. New York: McGraw-Hill.
- Jappelli, T. & Pagano, M. (2002). Information sharing, lending and defaults: cross-country evidence, *Journal of Banking & Finance*, 26, 17-45
- Keynes, J. M. (1989). *The Collected Writings of John Maynard Keynes*, London: Macmillan for the Royal Economic Society
- Kosmidou, K. (2008). The determinants of banks profits in Greece during the period of EU Financial integration. *Journal of Managerial Finance*. 5(1), 85-88.
- Madiri T (2015). Significance of assets and liabilities management to liquidity risk for Zimbabwean commercial banks. National university of science and technology faculty of commerce.
- Marcus, A. J. (1983). *The bank capital decision: a time series-cross sectional analysis*.
- Markowitz, H. (1952). Portfolio Selection, *Journal of Finance* 7.
- Mihail I.C. (2009). *Effects of Asset Liability Management in Banks*. An Empirical study of Banks in Europe. Faculty of Finance.
- Modigliani, F. & Miller, H. (1958). *The cost of capital, corporation finance, and the Theory of Investment*, *American Economic Review* 48,261-297.
- Moore, R. (2006). The impact of asset and liability management on financial performance of commercial banks in United Kingdom, *Journal of finance and Accounting*, United Kingdom.
- National bank of Ethiopia directive no NBE.SBB/57/2014
- NBE Directives No.SBB/9/95. (n.d.). National Bank of Ethiopia Licensing and Supervision of Banking Business Proclamation No.84/1994 (1994). Minimum Capital Requirement for Banks [Online], available at <http://www.nbe.gov.et>.
- NBE, N. B. (2009/10). NBE, “Annual report”. Addis Ababa, Ethiopia.

- Obari, L. (2015). The effect of asset liability management on profitability of commercial banks in Kenya a research paper, school of business, university of Nairobi.
- Ongore, O. (2013). Determinants of Financial Performance of Commercial Banks in Kenya, *International Journal of Economics and Financial*, Issues Vol. 3, No. 1, 2013, pp.237
- Owoputi J. (2014). Bank specific, industry specific and macroeconomic determinants of bank profitability in Nigeria. *European scientific journal* September 2014 edition vol.10, no.25 issn: 1857 – 7881 (print) e - issn 1857- 7431.
- Ramlall, I. (2009). Bank Specific, Industry Specific and Macroeconomic Determinants of Profitability in Taiwanese Banking System: Under Panel Data Estimation, *International Research Journal of finance and Economics*.
- Seblewongel L. (2017). Impact of Asset Liability Management on Profitability of Commercial Banks in Ethiopia Addis Ababa University Department of Accounting and Finance.
- Sheela, P and Bastray, T. (2014). Effect of asset liability management on commercial bank profitability in Indian financial market. *International Journal of Business and Administration*, Vol.1, Issue.6, July - Sep, 2014.
- Soyibo et al, (1991). Financial System Regulation, Deregulation and Saving Mobilisation in Nigeria, African Economic Research Consortium, Nairobi, Kenya.
- Stierwald, A. (2010). The impact of asset and liability management on Profitability: An Analysis of Large Australian Firms (April 30, 2010). Melbourne Institute.
- Tabari N. (2013). The Effect of Liquidity Risk on the Performance of Commercial Banks *International Research Journal of Applied and Basic Sciences*.

- Tamiru, B. (2013). Asset Liability Management and Commercial Banks Profitability in Ethiopia, *Journal of Finance and Accounting*.
- Uyemura, D.G. & Van Deventer, D.R. (2003). *Financial Risk Management in Banking*, McGraw-Hill, New York, NY.
- Vossen B. (2010). *A study on Bank Liquidity Management*. University at Albany, State University of New York.
- Wooldridge. (2009). *Introductory Econometrics: A modern Approach*. South Western, Division of Thomson Learning.
- \_\_\_\_\_ (2013). *Introductory Econometrics: A modern Approach*. Fifth edition South Western engage.
- Zenios, S. & Ziemba, W. T. (2007). *Handbook of asset and liability management: Theory and Methodologies*. North Holland.
- Zopounidis, C. (2001). Multicriteria decision aid in financial management, *European Journal of Operational Research*, 119, 2.

# Appendix

## Appendix A: Normality test



Source: Result from Eview 9

## Appendix B: Correlated Random Effects - Hausman Test

Correlated Random Effects - Hausman Test

Equation: Untitled

Test period random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Period random	0.000000	7	1.0000

## Appendix C: Heteroskedasticity Test: White

Heteroskedasticity Test: White

F-statistic	1.614136	Prob. F(35,74)	0.0529
Obs*R-squared	47.62201	Prob. Chi-Square(35)	0.0756
Scaled explained SS	46.30366	Prob. Chi-Square(35)	0.0958

Source: Result from Eview 9

**Appendix D: Regression Results For impact of asset liability management on financial performance of commercial banks in Ethiopia.**

Dependent Variable: ROA

Method: Panel EGLS (Period random effects)

Date: 04/05/21 Time: 14:16

Sample: 2010 2019

Periods included: 10

Cross-sections included: 11

Total panel (balanced) observations: 110

Swamy and Arora estimator of component variances

White cross-section standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
AQ	-0.277036	0.088763	-3.121096	0.0023
CA	-0.023641	0.004936	-4.789228	0.0000
FC	0.018447	0.003903	4.726374	0.0000
ID	0.077201	0.008234	9.375602	0.0000
LR	0.051319	0.006169	8.319589	0.0000
OE	-0.000151	7.52E-06	-20.08088	0.0000
SIZE	0.008086	0.004306	1.877948	0.0632
C	-0.062610	0.021448	-2.919122	0.0043

Effects Specification

	S.D.	Rho
Period random	0.000000	0.0000
Idiosyncratic random	0.008057	1.0000

Weighted Statistics

R-squared	0.483143	Mean dependent var	0.032519
Adjusted R-squared	0.447673	S.D. dependent var	0.011569
S.E. of regression	0.008598	Sum squared resid	0.007540
F-statistic	13.62096	Durbin-Watson stat	1.865601
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.483143	Mean dependent var	0.032519
Sum squared resid	0.007540	Durbin-Watson stat	1.865601

**Source: Result from Eview 9**

**Appendix E:descriptive statistic**

	ROA	AQ	CA	FC	ID	LR	OE	SIZE
Mean	0.03251	0.0051	0.1447	0.0563	0.4597	0.6201	4.8375	3.9995
Median	0.0330	0.0040	0.1316	0.0287	0.4550	0.6180	1.1089	4.0558
Maximum	0.0646	0.0571	0.9823	0.6593	0.7670	0.8911	359.6000	4.8729
Minimum	-0.0158	-0.0027	0.0414	0.0077	0.0675	0.4049	-2.0733	2.5792
Std. Dev.	0.0115	0.0067	0.0894	0.1137	0.1331	0.0857	34.2815	0.4496
Observations	110	110	110	110	110	110	110	110

**Source: Result from Eview 9****Appendix F: correlation matrix**

	ROA	AQ	CA	FC	ID	LR	OE	SIZE
ROA	1.000000							
AQ	-0.158418	1.000000						
CA	-0.164849	-0.023958	1.000000					
FC	-0.055217	-0.113618	-0.076233	1.000000				
ID	0.361968	0.031501	0.009701	-0.457188	1.000000			
LR	-0.079480	0.220104	0.144379	0.031649	-0.479527	1.000000		
OE	-0.306811	0.110561	-0.052029	-0.044108	0.109708	0.216250	1.000000	
SIZE	0.027724	-0.135605	-0.187490	0.335679	-0.652995	0.379693	-0.071744	1.000000

**Source: Result from Eview 9**

**Appendix G: Panel data imputed in Eviews 9 software**

Com	Year	RoA	CA	AQ	LR	OE	ID	SIZE	FC
1	2,010	0.04	0.11	0.01	0.52	0.52	0.72	3.95	0.03
1	2,011	0.04	0.09	0.00	0.51	0.42	0.74	4.15	0.03
1	2,012	0.05	0.13	0.00	0.60	0.56	0.54	4.08	0.03
1	2,013	0.05	0.14	0.01	0.61	0.73	0.53	4.17	0.03
1	2,014	0.04	0.13	0.00	0.61	0.74	0.58	4.30	0.03
1	2,015	0.04	0.13	0.00	0.67	0.93	0.51	4.38	0.03
1	2,016	0.03	0.13	0.00	0.68	1.07	0.44	4.47	0.03
1	2,017	0.03	0.11	0.00	0.74	1.11	0.41	4.62	0.03
1	2,018	0.03	0.07	0.00	0.72	1.00	0.31	4.81	0.03
1	2,019	0.04	0.09	0.00	0.79	0.78	0.35	4.87	0.04
2	2,010	0.03	0.08	0.00	0.50	1.00	0.47	4.16	0.07
2	2,011	0.04	0.10	0.00	0.53	1.00	0.50	4.17	0.09
2	2,012	0.05	0.10	0.00	0.58	1.00	0.49	4.24	0.12
2	2,013	0.04	0.10	0.00	0.56	1.00	0.38	4.30	0.15
2	2,014	0.04	0.12	-	0.53	1.00	0.38	4.34	0.19
2	2,015	0.03	0.08	0.00	0.58	1.00	0.30	4.54	0.25
2	2,016	0.03	0.12	0.00	0.56	1.00	0.28	4.46	0.66
2	2,017	0.03	0.12	0.01	0.65	1.00	0.25	4.54	0.60
2	2,018	0.03	0.13	0.00	0.65	1.00	0.07	4.66	0.63
2	2,019	0.02	0.12	0.00	0.73	1.00	0.14	4.75	0.57
3	2,010	0.03	0.09	-	0.61	0.74	0.61	3.80	0.02
3	2,011	0.04	0.09	0.01	0.55	0.76	0.54	3.86	0.03
3	2,012	0.04	0.11	0.01	0.58	0.78	0.44	3.92	0.03

3	2,013	0.03	0.11	0.01	0.55	0.78	0.44	4.01	0.02
3	2,014	0.02	0.07	0.00	0.56	0.66	0.52	4.33	0.03
3	2,015	0.03	0.13	-	0.53	1.24	0.42	4.14	0.03
3	2,016	0.03	0.13	0.00	0.59	1.52	0.45	4.23	0.03
3	2,017	0.03	0.11	0.00	0.67	1.43	0.44	4.40	0.03
3	2,018	0.02	0.13	0.01	0.70	1.90	0.25	4.50	0.04
3	2,019	0.03	0.13	0.01	0.74	1.72	0.28	4.59	0.05
4	2,010	0.06	0.18	0.00	0.63	0.54	0.65	3.76	0.02
4	2,011	0.06	0.17	0.01	0.49	0.56	0.70	3.91	0.02
4	2,012	0.05	0.19	0.00	0.62	0.55	0.58	3.92	0.02
4	2,013	0.04	0.18	0.00	0.62	0.72	0.47	4.02	0.02
4	2,014	0.04	0.19	0.00	0.55	1.09	0.49	4.05	0.03
4	2,015	0.03	0.18	0.00	0.62	1.29	0.46	4.14	0.03
4	2,016	0.03	0.17	0.01	0.68	1.49	0.43	4.21	0.03
4	2,017	0.03	0.16	0.00	0.73	1.37	0.48	4.32	0.03
4	2,018	0.04	0.14	0.01	0.73	1.22	0.42	4.44	0.04
4	2,019	0.02	0.14	0.01	0.70	1.97	0.32	4.49	0.04
5	2,010	0.04	0.11	0.01	0.55	0.64	0.64	3.77	0.02
5	2,011	0.04	0.12	0.00	0.54	0.51	0.60	3.89	0.02
5	2,012	0.05	0.13	0.00	0.60	0.56	0.49	3.94	0.03
5	2,013	0.03	0.10	-	0.58	1.15	0.46	4.08	0.03
5	2,014	0.02	0.13	-	0.57	1.43	0.36	4.07	0.03
5	2,015	0.02	0.12	0.00	0.58	1.65	0.41	4.16	0.03
5	2,016	0.02	0.12	0.00	0.65	1.68	0.39	4.24	0.04
5	2,017	0.00	0.98	0.00	0.73	26.40	0.34	4.34	0.04
5	2,018	0.03	0.11	0.01	0.65	1.61	0.33	4.45	0.04

5	2,019	0.02	0.11	0.00	0.75	1.74	0.25	4.55	0.05
6	2,010	0.04	0.13	0.01	0.62	0.64	0.62	3.84	0.02
6	2,011	0.04	0.14	0.01	0.54	0.56	0.60	3.91	0.02
6	2,012	0.04	0.17	0.00	0.64	0.56	0.54	3.96	0.03
6	2,013	0.04	0.18	-	0.68	0.70	0.42	3.96	0.03
6	2,014	0.04	0.18	-	0.68	0.71	0.42	4.03	0.02
6	2,015	0.03	0.16	-	0.71	1.06	0.35	4.12	0.03
6	2,016	0.03	0.16	-	0.60	1.11	0.28	4.20	0.03
6	2,017	0.03	0.14	0.00	0.65	1.08	0.32	4.32	0.03
6	2,018	0.02	0.13	0.00	0.63	1.44	0.25	4.43	0.04
6	2,019	0.03	0.13	0.00	0.70	1.28	0.22	4.53	0.04
7	2,010	0.02	0.11	0.01	0.53	1.80	0.53	3.25	0.02
7	2,011	0.03	0.10	(0.003)	0.40	1.19	0.65	3.40	0.02
7	2,012	0.04	0.11	0.00	0.49	0.75	0.54	3.56	0.02
7	2,013	0.04	0.11	0.01	0.47	0.67	0.64	3.82	0.02
7	2,014	0.06	0.15	0.01	0.67	0.64	0.59	3.87	0.02
7	2,015	0.04	0.12	0.03	0.89	1.26	0.48	4.06	0.02
7	2,016	0.00	0.11	0.06	0.70	21.75	0.30	4.03	0.03
7	2,017	0.01	0.09	-	0.68	3.33	0.30	4.25	0.02
7	2,018	0.01	0.08	0.00	0.57	4.56	0.35	4.48	0.02
7	2,019	0.02	0.08	0.00	0.61	2.49	0.34	4.62	0.03
8	2,010	0.04	0.18	0.01	0.57	0.82	0.60	3.13	0.02
8	2,011	0.03	0.20	0.00	0.52	0.84	0.57	3.26	0.02
8	2,012	0.04	0.18	0.01	0.56	0.71	0.58	3.39	0.02
8	2,013	0.05	0.18	0.00	0.63	0.60	0.53	3.47	0.03
8	2,014	0.04	0.17	0.00	0.57	1.11	0.50	3.56	0.03

8	2,015	0.04	0.14	0.01	0.64	1.36	0.59	3.77	0.02
8	2,016	0.04	0.13	0.01	0.68	1.55	0.51	3.91	0.03
8	2,017	0.03	0.13	0.00	0.63	1.29	0.37	4.04	0.03
8	2,018	0.03	0.13	0.01	0.65	1.26	0.31	4.16	0.04
8	2,019	0.03	0.13	0.01	0.72	1.31	0.34	4.31	0.04
9	2,010	0.02	0.19	0.01	0.45	2.02	0.77	3.05	0.02
9	2,011	0.03	0.15	0.00	0.43	1.13	0.76	3.29	0.02
9	2,012	0.02	0.16	0.01	0.48	1.66	0.61	3.45	0.03
9	2,013	0.02	0.14	0.01	0.53	1.95	0.51	3.59	0.02
9	2,014	0.03	0.12	0.00	0.51	1.16	0.49	3.79	0.02
9	2,015	0.02	0.10	0.01	0.65	1.82	0.41	3.98	0.02
9	2,016	0.02	0.12	0.01	0.55	2.61	0.34	4.05	0.03
9	2,017	0.02	0.10	0.01	0.53	2.08	0.50	4.21	0.02
9	2,018	0.04	0.11	0.00	0.59	1.05	0.43	4.38	0.03
9	2,019	0.03	0.12	0.01	0.66	1.39	0.35	4.50	0.03
10	2,010	-0.02	0.27	0.01	0.64	-2.07	0.38	2.58	0.01
10	2,011	0.03	0.16	0.01	0.48	0.90	0.67	2.96	0.03
10	2,012	0.04	0.18	0.00	0.54	0.74	0.64	3.11	0.03
10	2,013	0.02	0.17	0.00	0.61	0.95	0.54	3.34	0.02
10	2,014	0.03	0.20	0.01	0.59	1.50	0.45	3.45	0.03
10	2,015	0.03	0.17	0.00	0.61	1.18	0.54	3.62	0.02
10	2,016	0.05	0.15	0.01	0.70	0.85	0.50	3.86	0.03
10	2,017	0.04	0.18	0.00	0.69	0.99	0.51	4.02	0.03
10	2,018	0.03	0.16	0.00	0.66	1.75	0.38	4.15	0.04
10	2,019	0.03	0.15	0.01	0.68	1.75	0.42	4.28	0.04
11	2,010	0.00	0.04	0.01	0.80	359.60	0.64	3.61	0.01

11	2,011	0.03	0.30	0.01	0.75	1.25	0.65	2.89	0.03
11	2,012	0.03	0.21	0.00	0.72	1.22	0.54	3.14	0.03
11	2,013	0.03	0.18	0.00	0.61	0.96	0.38	3.33	0.03
11	2,014	0.04	0.17	0.00	0.62	1.24	0.48	3.48	0.03
11	2,015	0.04	0.15	0.00	0.69	1.16	0.44	3.65	0.03
11	2,016	0.04	0.14	0.01	0.67	1.23	0.43	3.83	0.03
11	2,017	0.03	0.14	0.01	0.70	1.53	0.44	3.99	0.03
11	2,018	0.03	0.15	0.01	0.69	1.35	0.36	4.11	0.04
11	2,019	0.04	0.18	0.01	0.78	1.23	0.40	4.16	0.04

**Source: 2019/20 NBE Annual Report ([www.nbe.gov.et](http://www.nbe.gov.et))**

#### **Appendix E: - List of Commercial Banks in Ethiopia**

S.No	Name of the bank	Year of establishment
1	Awash International Bank	1994
2	Dashen Bank	1995
3	Abyssinia Bank	1996
4	Wegagen Bank	1997
5	United Bank	1998
6	Nib International Bank	1999
7	Cooperative Bank of Oromia	2005
8	Lion International Bank	2006
9	Oromia International Bank	2008
10	Buna International Bank	2009
11	Birhan International Bank	2010

**Source: 2019/20 NBE Annual Report ([www.nbe.gov.et](http://www.nbe.gov.et))**