DETERMINANTS OF LIQUIDITY IN ETHIOPIAN PRIVATE COMMERCIAL BANKS

BY

GULUMA TURUNA

A Thesis Submitted to School of Graduate Studies of Jimma University in Partial Fulfilment of the Requirementfor the Award of the Degree of Master of Science in Banking and Finance

JIMMA UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

DEPARTMENT OF BANKING AND FINANCE

JUNE, 2021
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BY:-GULUMA TURUNA

UNDER THE GUIDANCE OF

MAIN ADVISOR: -TADELE MENGESHA (ASSOCIATE PROFESSOR)

CO-ADVISOR: - EDEN DEMISSIE (MSc)

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CERTIFICATE

This is to certify that the thesis entitled: "***Determinants of liquidity in Ethiopian private commercial banks***" submitted in partial fulfillment of the requirements for Master of Science in Banking and Finance complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

Therefore, we hereby declare that no part of this thesis has been submitted to any other university or institutions for the award of any degree or diploma.

Main advisor _____Signature _____Date _____

Co advisor _____signature_____ Date_____

DECLARATION

I hereby declare that this thesis entitled "*Determinants of Liquidity in Ethiopian Private Commercial Banks*" has been carried out by me under the guidance and supervision ofTadeleMangesha (Associate professor) and Mrs. Eden Demissie (MSc)

The thesis is original and has not been submitted for the award of any degree or diploma to any university or institution.

Researcher's Name   Date   Signature

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Acknowledgement

Abstracts

Bank Liquidity has one of the major concerns for private banks and thus achieving the optimum level of liquidity is fundamental. The main objective of this study was to identify the determinants of liquidity of private commercial banks in Ethiopia. In order to achieve the research objectives, secondary data were collected from a sample of seven private commercial banks in Ethiopia over the period from 2005 to 2020.Bank specific and macroeconomic variables were analyzed by using the pooled OLS regression model. Bank's liquidity was measured in the ratio of loans todeposit. The findings of the study revealed that, capital adequacy, bank size, and deposit had positive and statistically significant impact on liquidity; while bank loan have negative and statistically significant impact on liquidity of Ethiopian private commercial banks. However, real GDP growth rate, interest rate margin have no statistically significant effect on the liquidity of Ethiopian private commercial banks.This study recommends that private commercial banks in Ethiopia should be more concerned withthe bank specific (internal environment)with the macroeconomic environment in addition to formulating strategies to enhance their liquidity position.

__Keywords__: Determinants of Liquidity, Ethiopian Private Commercial Banks, Liquidity Ratio, pooled OLS model

LIST OF ACRONYMS/ABBREVIATIONS

AIB: AwashInternationalBank S.C.

BCBS: Basel Committee for Banking Supervision

BIS: Bank for International Settlement

BLUE: Best Linear Unbiased Estimator

BOA: Bank of Abyssinia S.C

CAP: Capital adequacy

CBB: Construction and Business Bank

CBE: Commercial Bank of Ethiopia

CLRM: Classical Linear Regression Model

CPI: Consumer Price Index

DB: Dashen Bank S.C

DW: Durbin-Watson

ESRB: European Systemic Risk Board

FEM: Fixed Effect Model

GDP: Gross Domestic Product

HP: Hypotheses

IRM: Interest Rate Margin

JB: Jarque-Bera

LCR: The Liquidity Coverage Ratio

LI: Liquidity Ratio

Lo: Loan

LOLR: Lender of Last Resort

MoFED: Ministry of Finance and Economic Development

NBE: National Bank of Ethiopia

NIB: Nib International Bank S.C

NPL: Non-performing loans

NSFR: Net Stable Funding Ratio

OLS: Ordinary Least Square

REM: Random Effect Model

ROA: Return on Assets

UB: United Bank S.C

WB: Wegagen Bank S.C

Tableof Contents

List of Table

List of Figures

x

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Banks play a vital role in any financial system by expressing its intermediary role through providing financing channels through turning financial resources from lenders to borrowers. (Diamond D. W. 2007)and (D. W. a. D. Diamond, Philip H, 1983)were one of the firsts to provide the evidence on the importance of role of the bank in creating liquidity that known as "transformational role" by accepting and transfer deposits that considered liquid liabilities to illiquid long-term loans, which makes bank exposed to risks with the possibility of huge sudden withdrawals of deposits. That what in turn makes banks interested about their liquidity positions especially with the chance of inability of banks to liquidate their assets at time with looked-for prices(D. W. Diamond, 2007), (De Waal, 2013)defines liquidity as "the ability of a bank to fund increases in assets and meet obligations as they come due, at reasonable cost". Therefore, banks should concern about having adequate level of liquidity to ensure their ability to perform their role of liquidity creation besides their ability to meet its commitments as it comes due.

Belete(2015), Stated that, Liquidity risk arises from the ultimate role of banks in the maturity conversion of short-term deposits into long-term loans. Therefore, banks have to hold prime level of liquidity that can make profitable and enable them to meet their obligation. Liquidity creation is the main objective of commercial banks because it is crucial for its existence. It is known that the banking sector plays an important role in the economic growth of a country. This is made through matching surplus economic units with deficit economic units. However, this fundamental role of banks in the 'maturity transformation' of short term deposits into long term loans make banks inherently vulnerable to liquidity risk, both of an institution specific nature or banks specific factor and that which affects markets as a whole, macroeconomic factor, Hailemarim(2018).

The competition in the banking business of Ethiopia becomes increasing from day to day as more new emerging private domestic banks are joining to the industry. Especially, in this regard the study made by Yimer(2016),suggestedthe financial sector in Ethiopia has been experiencing major transformation on its operating environment recently following the transitional government. On top of this, sixteen private commercial banks have been opened

during the last twenty years which paves the way for competition among banks in terms of resource mobilization which leads to curiosity in liquidity management.

The related issues of determinants of banks liquidity were studied by various researchers in outside the country and in inside. Among those paper studied in other country the following are some;(D. W. Diamond, 2007),(Laurine, 2013),Diamond (2007), (Vodov{'a}, 2011),(Malik, 2013), Basel committee (2008), and they reveals that, bank liquidity is affected by both bank specific and macroeconomic factors. However, those factors which were statistically significant impact on liquidity in one country may not be duplicated in another country.

In the context of Ethiopian commercial banks, to the knowledge of the researcher, there aresome research studied on related area and they are;Yimer (2016), he did on "determinants of liquidity in commercial banks of Ethiopia: The case of selected private banks. "The other one was conducted byTseganesh(2012)on "the assessment of determinants of the banks liquidity which was conducted by examining determinants of liquidity of commercial banks in Ethiopia, including public banks" andBelete(2015)worked on "Factors Affecting Liquidity of Selected Commercial Banks in Ethiopia."Hailemarim(2018) did on "Determinants of banks Liquidity: Empirical Evidence using panel regression analysis on selected big asset commercial banks in Ethiopia. Assfaw(2019), on the title of "Firm-Specific and Macroeconomic Determinants of Banks Liquidity: Empirical Investigation from Ethiopian Private Commercial Banks".BerihunEngida (2015)worked on "Determinants of Banks Liquidity and their Impact on Profitability: Evidenced from eight commercial banks in Ethiopia".Melese(2015)on Determinants of Banks Liquidity: Empirical Evidence on Ethiopian Commercial Banks and Molla(2017), worked on "Determinants of Banks Liquidity: A Study on Selected Commercial Banks in Ethiopia"

However, From those related previous studies there was a gap that a researcher need to fill in this paper and also there are a lot of conflicting theories or different results for relatively the same studies so the researcher need to check the methodologies they engaged for gathering and analyzing their data and fill the gap related with thedeterminants of private commercial banks liquidity over the year started from (2005-2020).Therefore, empirical studies are essential to identify the determinants of liquidity of Ethiopian private commercial banks which are selected by the researcher of this paper. Depending on their year of foundationseven private owned commercial banks are selected for this study. Hence, this

paper aims to study on the determinants of banks liquidity in Ethiopian selected private commercial banks.

1.2 Statement of the problem

The concern of many empirical studies carried out on the commercial banking industry of Ethiopia was on examinations of factors influencing the profitability of banks, and limited attention was given to consider determinants of banks liquidity(Assfaw, 2019). Banks play a fundamental role in all modern financial systems. To perform this role, banks must be safe.Moreover, with regard to liquidity, the fundamental role of banks in the maturity transformation of short-term deposits into long-term loans makes banks inherently vulnerable to liquidity risk, both of an institution specific factor and macro-economic factors that which affects markets as a whole(Belete, 2015). When banks hold surplus liquid asset which are non-earning assets such as cash and non-interest bearing deposits, the bank's profitability would be affected. Hence, every bank have to ensure that it operates to satisfy its profitability target and at the same time to meet the financial demands of its customers by maintaining optimum level of liquidity(Yimer, 2016).In current days, following the financial crisis of 2007, liquidity risk has become one of the major concerns of financial institutions throughout the world. The financial crisis discovered that, liquidity becomes one of the top priorities of a bank's management to ensure the availability of sufficient funds to meet future demands at reasonable costs. Therefore, identifying the determinants of banks liquidity buffer has become the major concern of all banks and their regulators so as to mitigate liquidity risk.

The Ethiopian financial sector is mainly bank-based as the secondary market is still not established in the country. Banks control the financial sector in Ethiopia and as such the process of financial intermediation in the country depends greatly on banks. Hence, keeping their optimal liquidity for banks in Ethiopia is very important to meet the demand by their present and potential customers

As it evidently indicated, liquidity and liquidity risk is very up to date and important issue. Therefore, pinpointing the major determinants of banks liquidity has become one of the major activities and duties of all banks and their regulators so as to keep a control on liquidity risk. Besides, the National Bank of Ethiopia has required banks to have their own liquidity policy (NBE, 2012) which enforces banks to monitor their funding structure and their ability to handle short term liquidity problems and offer them with a better means of assessing the present and future liquidity related problems linked with their future liquidity position.

Presently a lot of researches were conducted by different researcher on the area, in which theiroutcomevariesorlackofconsistencies. For instance, Tseganesh (2012),Belete, (2015)(Molla, 2017), Melese (2015) and Tekle (2019) werefound that capital adequacy has positive and significant effect on liquidity, but Yimer(2016),found that insignificant impacts on bank liquidity.Besides Belete, (2015) found that bank size has insignificant result on banks liquidity, whereas (Molla, 2017),Tseganesh (2012), Melese (2015) and Yimer (2016)had found that statistically significant on bank liquidity.Melese (2015) and Tseganesh (2012) both found that loan growth had statistically insignificant impacts on liquidity whereas Molla (2017), Belete, (2015), Yimer (2016) and Assfaw (2019) were found significant effect of loan growth on bank liquidity. When it comes to the variable profitability measured by ROA Belete, (2015) found that insignificant on banks liquidity whereas Melese (2015), (Molla, 2017)and Yimer (2016) were found that as it has significant impacts on bank liquidity. On the other hand when it comes to the variable real gross domestic product (GDP) to the knowledge of the researcher, four researcher among the pervious study, means Tseganesh (2012), Yimer (2016), Belete, (2015) and(Molla, 2017) were found insignificant impacts on bank liquidity whereas (Assfaw, 2019) and(BerihunEngida, 2015) found it as it has significant impacts on bank liquidity. On the relationship between interest rate margin and liquidity some studies like (Molla, 2017), Tekle (2019),Belete, (2015), BerihunEngida (2015) and Tseganesh (2012) found significant results whereas Yimer (2016) found it, as it has no significant effect on bank liquidity.In Ethiopian context only two researchers were studied on variable bank deposit and they were Assfaw (2019) and Tekle (2019) which were both found significant effect it has on bank liqiudity.

Besides to the above inconsistence result for relatively the same studies, there was some methodology related gap in those research and all have remaining unsolved area. Therefore; the purpose of this study is to fill the above stated gap by analyzing firm specific and macroeconomic determinants of seven private commercial banks in Ethiopia. The period of this study was expected to be from period 2005-2020 and including new variables. In conclusion, providing full information about the relationship between liquidity and firm specific and macroeconomic determinants of private banks liquidities in the recent data is essential for this study.

1.3. Objective of the study

1.3.1 General Objective
The general objective of this study is to identify the determinants of private commercial banks liquidity in Ethiopia.

1.3.2. Specific objectives
The specific objectives of the study would be identifying both macroeconomic nature determinants of banks liquidity and bank specific which are specifically explained below that the researchers expected to do;

1. To determines the impact of capital adequacy on private banks liquidity in Ethiopia.

2. To determines the impact of bank size on private banks liquidity in Ethiopia.

3. To determines the impacts of loan on private banks liquidity in Ethiopia.

4. To determines the impacts of deposit on private banks liquidity in Ethiopia

5. To determines the impact of profitability on private banks liquidity in Ethiopia.

6. To determines the impacts of real gross domestic product (GDP) on private banks liquidity in Ethiopia

7. To determines the impacts of interest rate margin on private banks liquidity in Ethiopia

1. 4. Research hypothesis
Hypotheses of the study depends on the theories related to a banks' liquidity that has been developed over the years by banking area researcher's and past empirical studies related to a bank's liquidity. It's based on the results from the literature review to be established in the next chapter which used to establish expectations for the relationship of the different determinants. To estimate and identify the determinant, the following major hypotheses have been tested in the case of private commercial banks in Ethiopia. These hypotheses were predictions about the outcome of the results and they may be written as alternative hypotheses specifying the exact results to be expected.

Therefore, this study developed the following 7 hypotheses:

H1: Capital adequacy has positive and significant effect on Ethiopian private banks liquidity.

H2: The impact of the size of banks on Ethiopian private banks liquidity is positive and statistically significant.

H3: loan has statistically insignificant and negative impacts on the liquidity of Ethiopian private banks.

H4: Deposit has statistically significant and positive effect on the liquidity of Ethiopian private banks.

H5: The influence of profitability onEthiopian private bank liquidity is expected to be positive and significant.

H6: Real GDP growth has negative and significant impact on the liquidity of Ethiopian private banks.   .

H7: Interest rate margin has negative and significant impact on the liquidity of Ethiopian private banks.

1.5. Scope of the study

This research is confined in identifying the determinants of banks liquidity on Ethiopian private commercial banks. Currently there are seventeen private with the inclusion of the new bankscalled,Zamzam banks and two publicly owned commercial banks in Ethiopia, the study nominated only seven privately owned commercial banks that have been operating in the country for at least fifteen years of experience at the end of June 30, 2020.

1.6 Significant of the study

The matter of liquidity management has now got great attention in the Ethiopian banking industry. Moreover, the supervisory authority has required banks to have their own liquidity policy which enable them to monitor their funding structure and their ability to handle short term liquidity problems and provide them with a better means of assessing the present and future liquidity risk associated. Thus, this study has great contribution to the Ethiopian private commercial banks to assess their liquidity requirement and to produce their liquidity policy and to give due consideration on those factors which have significant impact on bank's liquidity. It has also a great contribution to the existing knowledge in the area of factors determining commercial banks liquidity. Therefore, the study as a whole will have great contribution to the supervisory authority, policy makers, commercial banks and other researchers to gain knowledge about their influence and the relationship between the

macroeconomic and bank specific factors and liquidity ofprivate commercial banks in Ethiopia.

1.7. Organizations of the paper

This research report paper has organized under five chapters. The first chapter provides the general overview or introduction of the study. The second chapter reviewed the related literatures on the determinants of bank's liquidity. The third chapter focuses on the methodology of the study. The fourth elaborate data analysis and interpretation and the final chapter incorporated withSummary, conclusion and recommendation of the study depending on the findings of the research.

CHAPTER TWO
REVIEW OF RELATED LITERATURES
2.1 INTRODUCTION

This chapter discusses the overview of banking in Ethiopia, theoretical and empirical literature on determinants of Ethiopian private banks liquidity. It summarizes the study from other researchers that have studiedtheir research in the same area of the study and it specifies objective, methodology and findings of other researchers. Theoretical and empirical relationship and the gap to be researched were summarized at the end of the chapter.

2.2 What is liquidity at a bank?

Liquidity can be defined as the ability of a financial institution to meet all legitimate demands for funds (Yeager, 1989). According to (Ally, 2013)liquidity indicates the ability of the bank to meet its financial obligations in a timely and effective manner. There should be adequacy of liquidity sources compared to present and future needs, and availability of assets readily convertible to cash without undue loss. Diamond(1983) and Rudolph(2009), emphasizes that, the liquidity expresses the degree to which a bank is capable of fulfilling its respective obligations. And also Liquid assets are those that can be converted to cash quickly if needed to meet financial obligations; examples of liquid assets generally include cash, deposit in central bank or to other banks and government debt. As per (Douglas, 2014) liquidity at a bank is a measure of its ability to readily find the cash it may need to meet demands upon it. Liquidity can come from direct cash holdings in currency or on account at the Federal Reserve or other central bank. More commonly it comes from holding securities that can be sold quickly with minimal loss. This typically means highly creditworthy securities, including government bills, which have short-term maturities. In the portfolios of commercial banks, liquid assets play a very vital role since the banks operate mainly with the funds borrowed from depositors in either forms of demand and time deposits. In view of the fact that these deposits represent the obligations of the banks to be paid whenever they are requested, the banks should always allocate their funds in such a way that their portfolios should always contain an adequate level of liquid assets. All in all, it can be inferred that liquid assets are viewed as the essential balance sheet items which have the capacity to maintain the confidence of depositors which is the most valuable intangible asset of the commercial banking business. Banks, deliberately or not, fail to maintain adequate levels of liquid assets in their portfolios are likely to create a fear or a loss of confidence among depositors over the safety of their deposits, and this fear is contagious (Friedman, M and

Schwarz, A, 1963), it spreads among the banks through deposits withdrawals or through correspondent relations.

Most significantly, the principal role of banks in the economy is to create liquidity by funding illiquid loans with liquid demand deposits or in other words banks actually collecting short term deposit and issuing loans for long terms cited by(Yimer, 2016). This liquidity creation role exposed banks for liquidity problem that banks need to manage in order to prevent itself from a sudden death. When bank does not have enough liquidity to fulfill its obligation, the bank is said to face liquidity risk. It is known that all businesses including banks face liquidity risk. However, the banks liquidity risk is inherent from its intermediation role of providing unequal maturities of deposit and loans (short-term deposit for long-term loans). As a consequence, banks basically need to hold an optimal level of liquidity to maintain efficiency and operative brilliance

In this literature part, researcher establishes the framework for the study and clearly identifying the gap in the literature that support to formulate the research hypotheses for the study. The rest part of this chapter is structured as the following;

2.3 Review of Related Theoretical Literature

2.3.1 Bank liquidity creation

According to the theory of financial intermediation, an important role of banks in the economy is to provide liquidity by funding long term, illiquid assets with short term, liquid liabilities. Through this function of liquidity providers, banks create liquidity as they hold illiquid assets and provide cash and demand deposits to the rest of the economy, (Diamond D. W., 1983),emphasize the "preference for liquidity" under uncertainty of economic agents to justify the existence of banks: banks exist because they provide better liquidity insurance than financial markets. However, as banks are liquidity insurers, they face transformation risk and are exposed to the risk of run on deposits. More generally, the higher is liquidity creation to the external public, the higher is the risk for banks to face losses from having to dispose of illiquid assets to meet the liquidity demands of customers. A natural justification for the existence of deposit-taking institutions, thereby giving also an explanation for the economically important role of banks in providing liquidity, was initially modelled by (Diamond D. W., 1983). They showed that by investing in illiquid loans and financing them with demandable deposits, banks can be described as pools of liquidity in order to provide households with insurance against idiosyncratic consumption shocks. However, this structure

is also the source of a potential fragility of banks since in case of an unexpected high number of depositors deciding to withdraw their funds for other reasons than liquidity needs, a bank run will result. The models have been subject to a large number of follow-up papers, extending or testing the models. Of particular relevance for this study are the papers by (calomiris, 1991)and (Diamond D. W., 2001), which develop and emphasize the point that demandable debt has interesting incentive implications for disciplining the bank management. The argument goes like this: on their asset side banks have illiquid loans whose market prices would be below their internal/book values in case of a fire sale. Having to sell or to call loans prematurely would involve a loss. The greater part of the activities which banks undertake – and need to undertake – to monitor their loans, which includes their active involvement in the governance of borrowing corporations, are not really observable for outsiders. However, at least a certain part of a bank's liability are call or sight deposits which are by definition and by law to be paid back on demand and on a first-come first-serve basis. This rule of distribution makes depositors wary that they might be late or stand too far behind in the waiting line in the case a bank encounters problems, and it makes them even aware of what little information they may have on the monitoring activity of the bank. This situation can lead to a bank run, and the danger of a run is what induces banks to do what their depositors want them to do, namely to be active delegated monitors in the spirit of (Diamond D. W., 1983). Based on this argument (Diamond D. W., 2001), raised the question whether or not financial fragility where small shocks lead to can have large effects on assets prices is a desirable state for banks. They argue that the existence of the fragility itself gives banks the right incentives to create liquidity. According to them, any kind of regulation, such as capital standards, impair this liquidity creation and should thus be avoided. (Kashyap, 2002), also conducted a related analysis justifying the existence of banks" liquidity creation. They argue that because banks carry out lending and deposit taking under the same roof, synergies must exist between these two tasks. These synergies can be found in the way deposits and loan commitments are secured through the holding of liquid assets as collateral against withdrawals. They regard these liquid assets as costly overheads. These overheads can be share by the two separate functions, hence the synergy. A detailed analysis of the link between liquidity shortages and systemic banking crises is given by (Diamond D. W., 2005). It is argued that the failure of a single bank can shrink the pool of available liquidity to the extent that other banks could be affected by it. A contagion effect is the result. However, as solvency and liquidity effects interact it is hard to determine the root of a crisis. Generally, liquidity risk arises from the fundamental role of banks in the maturity transformation of

short-term deposits into long term loans. According to Joint Forum of the Basel Committee (2006), banks liquidity risk includes two types of risk: funding liquidity risk and market liquidity risk. Funding liquidity risk is the risk that the bank will not be able to meet efficiently both expected and unexpected current and future cash flow and collateral needs without affecting either daily operations or the financial condition of the firm. Market liquidity risk is the risk that a bank cannot easily offset or eliminate a position at the market price because of inadequate market depth or market disruption. There are strong interactions between funding liquidity risk and market liquidity risk, especially in periods of crisis. (Nikolaou, 2009), pointed to the fact that shock to funding liquidity can lead to asset sales and may lead to decrease of asset prices. Lower market liquidity leads to higher margin which increase funding liquidity risk. Events in the second half of 2007 and early 2008 highlight the crucial importance of liquidity to the functioning of markets and the banking sector as well as links between funding and market liquidity risk, interrelationships of funding liquidity risk and credit risks, reputation effects on liquidity, and other links among liquidity and other typical banking features. Liquidity risk is not an „isolated risk" like credit or market risks (although credit risk often arise as a liquidity shortage when the scheduled repayments fall due), but a "consequential risk", with its own intrinsic characteristics, that can be triggered or exacerbated by other financial and operating risks within the banking business(Chen, 2018)

A first requirement to study banks liquidity buffers is to get an adequate definition of liquidity. The financial economics literature distinguishes between two concepts of liquidity: market liquidity and funding liquidity(Drehmann, 2013). Market liquidity describes a particular characteristic of an asset. A high degree of market liquidity implies the ability to offset or eliminate a position in a given asset at or close to the current market price. This feature of the asset may not be constant over time. An asset which is currently market liquid may not necessarily have been market liquid in the past, nor need it be continuously market liquid in the future. Factors such as market concentration or the prevalence and distribution of asymmetric information may affect the degree of market liquidity.

Funding liquidity describes specific characteristics of a financial agent: it refers to its ability to meet obligations as they come due. Funding liquidity risk is the risk that the bank will not be able to meet efficiently both expected and unexpected current and future cash flow and collateral needs without affecting either daily operations or the financial condition of the firm. At any point in time, a financial institution is either funding liquid or not. Nevertheless,

the two concepts are linked (Brunnermeier, 2009). Suppose a bank only holds assets which are perfectly market-liquid. In this case the bank will also be funding liquid, as long as it is solvent. Market liquidity, however, may vary over time, and an institutions funding liquidity may thus change accordingly. Suppose a sufficiently large portion of the bank's assets suddenly become perfectly market illiquid, while the bank remains solvent. The bank will no longer be able to honor its short-term obligations and will become distressed. This is, in fact, a stylized description of the difficulties encountered by a large number of financial institutions during 2007, the previously highly liquid market for mortgage backed securities dried up. This situation highlight the crucial significance of liquidity to the functioning of markets and the banking sector as well as links between funding and market liquidity risk, interrelationships of funding liquidity risk and credit risks, reputation effects on liquidity, and other links among liquidity and other typical banking features.

For the purpose of this study, we require a measure of market-liquid assets held by banks to guarantee constant funding liquidity. Yet the example above highlights the difficulty of obtaining a measure that adequately accounts for the dynamic nature of market liquidity. To circumvent this problem, we focus only on those assets in banks" portfolios which - virtually by their definition – are permanently market-liquid: cash and due from banks. We expect that this narrow definition of liquidity captures banks" qualitative choices about liquidity buffers.

Liquidity risk refers to the risk that a financial agent will be unable to meet obligations at a reasonable cost as they come due. In other words, it reflects the probability that the agent will become funding illiquid during a given time period. As explained in the previous section, banks" core business is to "borrow short and lend long" they are especially prone to liquidity risk. Banks manage the liquidity risk inherent in their balance sheets by maintaining a buffer of market-liquid assets - such as cash or government securities which anticipates their depositors" liquidity demands within the relevant timeframe.

As pointed out by D. W. Diamond (2007)banks thus benefit from the ability to pool liquidity risk over a large group of depositors. It would be undesirable for banks to invest only in perfectly market-liquid assets at all times as this would effectively eliminate the pooling advantage banks have compared to the liquidity risk management that could be undertaken by their individual customers. Yet, it would be equally undesirable for banks not to invest in market-liquid assets at all, as this would burden depositors with excessive liquidity risks.

Until recently, liquidity risk was not the main focus of banking regulators. The 2007-2009 crisis showed, however, how rapidly market conditions can change exposing severe liquidity risks in institutions, many times unrelated to capital levels. Now, there is wide agreement that insufficient liquidity buffers were a root cause of this crisis and the on-going disruptions of the world financial system, making the improvement of liquidity risk analysis and supervision a key issue for the years to come (Brunnermeier, 2009)and (Laeven, 2004)

Efforts are underway internationally as well as in individual countries to establish or reform (existing) liquidity risk frameworks, most notably by the Basel Committee for Banking Supervision (BCBS). The BCBS"s new regulatory framework (Basel III) proposes a short and long-term liquidity requirement to reinforce the resilience of banks to liquidity risks (BCBS, 2010 and BCBS, 2013). The Liquidity Coverage Ratio (LCR) is a short-term ratio requiring financial institutions to hold enough liquid assets to withstand a thirty day stress period. The second measure, the Net Stable Funding Ratio (NSFR) aims at improving banks" longer-term, structural funding. BCBS (2013) also requires institutions to disclose certain elements regarding their fulfillment of these minimum requirements. Recently the European Systemic Risk Board (ESRB) has recommended national supervisory agencies to intensify the supervision of liquidity and funding risks as well (ESRB, 2013).

2.3.2 Keynes -Liquidity preference Theory

The economics and finance literature analyze possible reasons for firms to hold liquid assets. (Brunner, 1968), identified three motives on why people demand and prefer liquidity. The transaction motive, here firms hold cash in order to satisfy the cash inflow and cash outflow needs that they have. Cash is held to carry out transactions and demand for liquidity is for transactional motive. The demand for cash is affected by the size of the income, time gaps between the receipts of the income, and the spending patterns of the cash available. The precautionary motive of holding cash serves as an emergency fund for a firm. If expected cash inflows are not received as expected cash held on a precautionary basis could be used to satisfy short-term obligations that the cash inflow may have been bench marked for. Speculative reason for holding cash is creating the ability for a firm to take advantage of special opportunities that if acted upon quickly will favor the firm.

2.3.3 Theory of Corporate Liquidity

Almeida(2015), proposed a theory of corporate liquidity demand that is based on the assumption that choices regarding liquidity will depend on firms' access to capital markets

and the importance of future investments to the firms. The model predicts that financially constrained firms will save a positive fraction of incremental cash flows, while unconstrained firms will not. Empirical evidence confirms that firms classified as financially constrained save a positive fraction of their cash flows, while firms classified as unconstrained do not. The cost incurred in a cash shortage is higher for firms with a larger investment opportunity set due to the expected losses that result from giving up valuable investment opportunities. Therefore, it is expected a positive relation between investment opportunity and cash holdings.

The theory further predicts that firms with better investment opportunities have greater financial distress costs because the positive Net Present Value (NPV) of these investments disappears (almost entirely) in case of bankruptcy. In this case, firms with better investment opportunities will keep higher levels of cash to avoid financial distress. To the extent that liquid assets other than cash can be liquidated in the event of a cash shortage, they can be seen as substitutes for cash holdings. Consequently, firms with more liquid asset substitutes are expected to hold less cash.

2.3.4 Bank liquidity Creation and Financial Fragility Theory

According to the theory of financial intermediation, an important role of banks in the economy is to provide liquidity by funding long term illiquid assets with short term liquid liabilities. Through this function of liquidity providers, banks create liquidity as they hold illiquid assets and provide cash and demand deposits to the rest of the economy. Banks perform valuable activities on either side of their balance sheets; on the asset side, they make loans to illiquid borrowers and on the liability side, they provide liquidity on demand to depositors. As of (Diamond D. W., 2005), depositors get better access to their funds than they would if they invested directly and earned the same expected return: this is liquidity creation. Borrowing firms too can find the bank to be a more reliable source of funding than another firm or individuals: banks insure borrowers against the liquidity risk that funding will be cut off prematurely.D. W. a. D. Diamond, Philip H (1983), emphasize the "preference for liquidity" under uncertainty of economic agents to justify the existence of banks: banks exist because they provide better liquidity insurance than financial markets; however, as banks are liquidity insurers they face transformation risk and are exposed to the risk of run on deposits. In general, the higher is liquidity creation to the external public; the higher is the risk for

banks to face losses from having to dispose of illiquid assets to meet the liquidity demands of customers

The usual justification for the existence of deposit taking institutions, thereby giving an explanation for the economically important role of banks in providing liquidity, was initially modeled by Bryant (1980), D. W. a. D. Diamond, Philip H (1983). They showed that by investing in illiquid loans and financing them with demandable deposits, banks can be described as pools of liquidity in order to provide households with insurance against idiosyncratic consumption shocks. However, this structure is also the source of a potential fragility of banks since in case of an unexpected high number of depositors deciding to withdraw their funds for other reasons than liquidity needs, a bank run will result.

Kashyap(2002)conducted a related analysis justifying the existence of banks liquidity creation. They argued that as banks carry out lending and deposit taking under the same roof, synergies must exist between these two tasks. These synergies can be found in the way deposits and loan commitments are secured through the holding of liquid assets as collateral against withdrawals. They regard these liquid assets as costly overheads. Diamond D. W. (2001) provides a detailed analysis of the link between liquidity shortages and systemic banking crises. It is argued that the failure of a single bank can shrink the pool of available liquidity to the extent that other banks could be affected by it. Generally, liquidity risk arises from the fundamental role of banks in the maturity transformation of short-term deposits into long term loans.

2.3.5 Quantitative Framework for Measuring Bank's Liquidity

Financial institution can mobilizes resources through new deposits, maturing assets, borrowed funds and/or using the discount window (borrowing from the central bank). While financial institution may encounter liquidity risk. According to (Rochet, 2008), the three sources of liquidity risk are; on the liability side, there is a large uncertainty on the volume of withdrawals of deposits or the rolled over of inter-bank loans, on the asset side, there is an uncertainty on the volume of new requests for loans that a bank will receive in the future, and off-balance sheet items, like credit lines and other commitments taken by the bank.

Some of the mechanisms to insure liquidity crises are: banks hold buffer of liquid assets on the asset side of the balance sheet such as cash, balances with central banks and other banks, debt securities issued by governments and similar securities or reverse repo trades reduce the probability that liquidity demands threaten the viability of the bank. The second strategy

is, banks can rely on the interbank market where they borrow from other banks in case of liquidity demand. The last strategy is that, the central bank typically acts as a Lender of Last Resort/LOLR to provide emergency liquidity assistance to particular illiquid institutions and to provide aggregate liquidity in case of a system-wide shortage (Aspachs O. a., 2005).

The two most widely used approaches to measure liquidity of banks are liquidity gap approach (flow perspective) or liquidity ratio approach (stock perspective). The liquidity gap/flow approach treats liquidity reserves as a reservoir which the bank assesses its liquidity risk by comparing the variability in inflows and outflows to determine the amount of reserves that are needed during the period. The liquidity gap approach adapts the variation between assets and liabilities both current and future period. A positive liquidity gap means for deficit, requiring for liabilities to be increased (Bassis, 2009)

The liquidity ratio/stock approach, in contrast, employs various balance sheet ratios to identify liquidity trends. The various ratios label for immediate viable source of funding. This indeed entitles portfolio of assets that can be sold off without any fuss and also adequate amounts of stable liabilities. Various authors like (Zuijderduijn, 2010), (Rycht{\'a}rik, 2009), and (Praet, 2008) have also provided similar understandings with liquidity ratios such asliquid assets to total assets, liquid assets to deposits, loans to total assets and loans to deposits. In short, the liquidity ratio carries varies balance sheet ratios to identify liquidity needs. Hence, to meet the objectives of this study, the liquidity ratio/stock approach was chosen over the flow/liquidity gap approach. The researcher of this study chooses to employ one liquidity ratios only tomeasure the impact that those independent variables have on liquidity and itstotal loan to total deposit ratio.

2.4 Determinants of Bank Liquidity
Theoretically factors affecting bank liquidity are basically divided into two categories, such as internal and external variables. The internal (bank-specific factors) are factors that are related to internal efficiencies and managerial decisions. Such factors include bank capital adequacy, bank size, loan, deposit, profitability and the like. The external or macro determinants are variables that are not related to bank management but reflect the economic and legal environment that affects the operation and liquidity positions of institutions. The macroeconomic factors that can affect bank liquidity include GDP, interest rate margin, inflation rate, reserve requirement among others.

2.4.1. Bank Specific Characteristics

The internal factors (bank specific factors) are individual bank characteristics which affect the bank's performance. These factors are basically influenced by the internal decisions of management and board. Such factors include determinants such as capital adequacy, bank size, loan, deposit, profitability (ROA) and the like.

Capital Adequacy and Bank Liquidity

Capital can be defined as common stock plus surplus fund plus undivided profits plus reserves for contingencies and other capital reserves. Besides, a bank's loan loss reserves which serve as a buffer for absorbing losses can be included as bank's capital (Audo, 2014)(Yimer, 2016), (Tseganesh, 2012), The recent theories suggest that, bank capital may also affect banks' ability to create liquidity. These theories produce opposing predictions on the relationship between capital and liquidity creation. In the "financial fragility-crowding out" theories predict that, higher capital reduces liquidity creation and lower capital tends to favor liquidity creation(D. W. a. R. Diamond, Raghuram G, 2001). They stated that, depositors will be charged a nominal fee for the intermediary service of loaning out their respective deposits. However, this fee differs according to the borrowers" capability of repayment.

On the other side, higher capital requirement provide higher liquidity to financial institutions. Where risk absorption theory is realized for higher capital improves the ability of banks to create liquidity. This evidence is provided by (D. W. a. D. Diamond, Philip H, 1983)and Allen and Gale (2004) stating that liquidity creation exposes banks to risk. The greater liquidity needs of banks, incur higher losses due to the disposal of illiquid assets at available market prices rather than the desired prices to meet the customers" obligations. (Al-Khouri, 2012), has also found that, bank capital increases bank liquidity through its ability to absorb risk. Thus, under the second view, the higher is the bank's capital ratio, the higher is its liquidity creation.It can be measured by total equity capital to total asset (Boadi, 2016), (Assfaw, 2019). The study of (Melese, 2015)revealed that capital adequacy has statistically significant and positive impacts on the liquidity of commercial banks. That means bank liquidity increases with higher capital adequacy of banks(Vodov{'a}, 2011), Singh & Sharma, 2016, (Vodova, (2013), (Assfaw, 2019)

H1; Capital adequacy has positive and significant effect on Ethiopian private commercial banks.

Bank Size and Bank Liquidity:

Bank size is defined broadly as the bank's net total asset that is included to capture the economies or diseconomies of scale. Many scholars used natural logarithm of the total assets as the proxy to measure the size of banks (Singh & Sharma, 2016; (Melese, 2015)as cited by (Assfaw, 2019)When bank size grows it will help them to overcome the risk but it should be noted that it may leads also to failure. According to the "too big to fail" argument, large banks would benefit from an implicit guarantee, thus decrease their cost of funding and allows them to invest in riskier assets (Iannotta, 2007) as cited by(Yimer, 2016)). If big banks are seeing themselves as "too big to fail", their motivation to hold liquid assets is limited. In case of a liquidity shortage, they rely on a liquidity assistance of Lender of Last Resort(Vodova, 2011). Thus, large banks are likely to perform higher levels of liquidity creation that exposes them to losses associated with having to sale illiquid assets to satisfy the liquidity demands of customers (Del Negro, 2017). Therefore, "too big to fail" status of large banks could lead to moral hazard behavior and excessive risk exposure and thus there can be negative relationship between bank size and liquidity.

In agreement for positive relationship between bank size and liquidity(Lin, 2019) and (Berger, 2009), state that smaller bank tend to emphasis on intermediation processes and transformation activities and they do have smaller amount of liquidity. Hence, there can be positive relationship between bank size and liquidity. According to the study ofMolla (2017),Vodova(2011) and (Assfaw, 2019), bank's liquidity is decreasing with the increment of the size of the banks. On the other side, the studies of(Tseganesh, 2012),(Melese, 2015)(Ferrouhi, 2013), (Malik, 2013)and (Shah, 2018) found out that size of banks has a positive effect on the bank's liquidity i.e. larger banks are more liquid than smaller banks.

 H2: The impact of the size of banks on Ethiopian private banks liquidity is positive and statistically significant.

Loan and Bank Liquidity

Since loans are illiquid assets, increase in the amount of loans means increase in illiquid assets in the asset portfolio of a bank. As it was made by various empirical studies as well as the above argument the study expected negative relationship between banks loan growth and liquidity. The proxy for loan growth was annual growth rate of gross loans and advances to customers (BerihunEngida, 2015), Loans & advances are the major earning asset of the

bank. They are granted to customer from the amount collected from depositors of the bank that are considered as illiquid assets and generate higher revenue to banks. Therefore, the increase in loan means an increase in illiquid assets and decrease liquid assets. The studies of(Melese, 2015), found out that loan growth has a negative but insignificant effect on the liquidity of banks. The study of(Fekadu, 2018)found out that there is an inverse relationship between loan growth and liquidity. Since loans are illiquid assets, an increase in the number of loans means an increase in illiquid assets in the asset portfolio of a bank that decreases banks liquidity.

H3: loan has statistically insignificant and negative impacts on privatebanks of Ethiopia.

Deposit and Bank liquidity

According to the findings of (Assfaw, 2019)there is an inverse relationship between deposits and bank's liquidity, which means rise in bank deposits results in the reduction of its liquidity. (Derrouiche, 2015), revealed that deposits have an insignificant impact on banks' liquidity. Bonner et al. (2015) and Singh and Sharma (2016) found that there is a positive influence of deposits on banks' liquidity. (Arif, 2012), also argued that banks face liquidity problems when deposits in banks are withdrawn unexpectedly.

H4; Deposit has statistically significant and positive effect on private commercial banks of Ethiopia.

Bank Liquidity and Profitability (ROA)

There is often that, these two variables pose a conflicting relationship (dilemma of maintaining liquidity or profitability exist). Liquidity needs constrain a bank from investing all its cash though profitability comes from either investing it or bank lending activities. Since banks need to be both profitable (shareholders demands) and liquid (legal regulations), there is inherently conflicts between the two and the need to balance both. According to the bankruptcy cost hypothesis of (hypotheses, 1995) we expect positive impact of liquidity on profitability whereas, negative impact according to the argument stating the opportunity cost of holding liquid assets as high return on investment. Hence, we can expect positive or negative impact of bank liquidity on profitability.

H5: The influence of profitability onEthiopian private bank liquidity is expected to be positive and significant.

2.4.2 Macroeconomic Fundamentals

The external or macro determinants are variables that are not related to bank management but reflect the economic and legal environment that affects the operation and liquidity positions of institutions. The macroeconomic factors that can affect bank's liquidity include factors such as GDP growth rate; inflation rate and short term interest rate among others.

GDP Growth and Bank Liquidity

Gross Domestic Product (GDP) is one of the macroeconomic factors that affect liquidity of banks. A major recession or crises in business operations reduces borrowers capability to service obligations which increases banks NPLs and eventually banks insolvency (Gavin, 1998)During economic boom, the demand for differentiated financial products is higher and may improve bank's ability to expand its loans and securities at higher rate and thus reduce liquidity. The other study made by (Lapavitsas, 2010) stated that, banks liquidity fondness is low in the course of economic boom where banks confidentiality expects to profit by expanding loanable fund to sustain economic boom while restricted loanable fund during economic downturn to prioritize liquidity. In line with this argument the loanable fund theory of interest states that, the supply for loan increases when the economy is at boom or going out of recession (Pilbeam, 2005).

Aspachs (2005) has also inferred that, banks prioritize liquidity when the economy plummets, during risk lending opportunities, while neglecting liquidity during economic boom when lending opportunities may be favorable. On the other hand, the studies made by (Bordo, 2001) suggested that during recession, it is likely for an increase in the number of loan default. This causes depositors to perceive high solvency risk and immediately tend to withdraw deposits held at financial institutions.

H6: Real GDP growth has negative and significant impact on the liquidity of Ethiopian private banks.

Interest Rate Margin and Bank Liquidity

Interest rate margin is one of the most important factors that gauge the efficiency of financial institutions. Interest rate margin is the difference between the gross cost paid by a borrower to a bank and the net return received by a depositor (Brock, 2000). According to (Azeez, 2013), interest rate margin is defined as the difference between interest income from loan and

advances as a fraction of the total loans and advances and the interest paid out on deposit as a percentage of total deposits. In the financial intermediation process, a bank collects money on deposit from one group (the surplus unit) and grants it out to another group (the deficit unit). These roles involve bringing together people who have money and those who need money. In such intermediation function, the bank will earn interest from loans & advances and pay interest for depositors. Thus, how well a bank manages its assets and liabilities is measured by the spread between the interest earned on the banks assets and interest costs on its liabilities. According to the liquidity preference theory, lenders need high interest rate which includes the liquidity premium in order to lend. The basic idea underlining this theory is that, lenders of funds prefer to lend short, while borrowers generally prefer to borrow long. Hence borrowers are prepared to pay interest rate margin/ a liquidity premium to lenders to induce them to lend long. The size of interest rate margin/ liquidity premium increases with the time to maturity. Therefore, as they got higher premium, lenders give up their liquid money (Pilbeam, 2005).H7: Interest rate margin has negative and significant impact on the liquidity of Ethiopian private banks.

2.5 Review of Related Empirical Studies

This section gives a brief review of the previous studies made on the determinants of bank's liquidity from both developed and developing nations. Moreover, most of the studies undertaken on bank liquidity consider both bank specific and macroeconomic factors to examine the determinants of liquidity of banks. So, the studies conducted in related to banks liquidity are reviewed as follows.

2.5.1 Related Empirical Studies in Developed (advanced) Countries

The study made on bank specific determinants of liquidity on English banks studied by,(Valla, 2006) and assumed that, the liquidity ratio as a measure of the liquidity should be dependent on the following factors: bank profitability and loan growth had negatively correlated with liquidity while size of the bank is ambiguous. Liquidity created by Germany's state-owned savings banks and its determinants has been analyzed by (Rauch et al. 2009). In the first step they attempted to measure the liquidity creation of all 457 state owned savings banks in Germany over the period 1997 to 2006 and they analyzed the influence of monetary policy on bank liquidity creation. To measure the monetary policy influence, the study developed a dynamic panel regression model. According to this study, the following factors determine bank liquidity: monetary policy interest rate, where tightening monetary policy expected to reduces bank liquidity, level of unemployment, which is connected with demand

for loans having negative impact on liquidity, savings quota affect banks liquidity positively, size of the bank measured by total number of bank customers have negative impact, and bank profitability expected to reduce banks liquidity.

Vodova(2011)examined the determinants of liquidity of commercial banks in Czech Republic through four liquidity ratios and related them with bank specific and macroeconomic data over a period from 2001 to 2010. This study observed drop of banks" liquidity as a result of the Global financial Crisis. The study reveals that the share of liquid assets in total assets and liquid asset in deposits and short term funding decreases with bank profitability, higher capital adequacy and bigger size of banks. In their opinion big banks rely on the interbank market and on liquidity assistance of Lender of Last Resort (LOLR). Liquidity measured by share of loans in total assets and in deposits and short term borrowings increases with growth of domestic product. They did not find any significant relationship between interest rates on loans, interest rate on interbank transactions or monetary policy interest rates, interest rate margins, the share of non-performing loans and the rate of inflation with liquidity.

The study made by (Lucchetta, 2007), on the hypothesis that "interest rates affect banks" risk taking and the decision to hold liquidity across European countries". The liquidity measured by different liquidity ratios should be influenced bybehavior of the bank on the interbank market. The more liquid the bank is, the more it lends in the interbank market. The results of the study revealed that the risk-free interest rate negatively affects the liquidity retained by banks and the decision of a bank to be a lender in the inter-bank market. Conversely, the inter-bank interest rate has a positive effect on such decisions. Typically, it is the smaller, risk-averse banks that lend in the inter-bank markets. Meanwhile, the risk-free interest rate is positively correlated with loans investment and bank risk-taking behavior

Vodova (2013), had also studied on the determinants of liquidity of Polish commercial banks. The data cover the period from 2001 to 2010. The results of panel data regression analysis showed that bank liquidity is strongly determined by overall economic conditions and dropped as a result of financial crisis, economic downturn and increase in unemployment. Bank liquidity decreases also with higher bank profitability, higher interest rate margin and bigger size of banks. On contrary, bank liquidity increases with higher capital adequacy, inflation, share of nonperforming loans and interest rates on loans and interbank transaction

2.5.2 Related Empirical Studies in Emerging (Developing) Economies

Lee(2013)studied the determinants of liquidity of 15 commercial banks in Malaysia in period (2003-2012). They used bank specific factors; size of bank, capital adequacy, profitability, credit and macroeconomic factors such as GDP, interbank rate, financial crisis. The empirical results show that all factors included are significant except interbank rate. The factors with positive influence on bank liquidity are Non-Performing Loan, Profitability and Gross Domestic Product. On the other hand, factors to bring negative effect to banks liquidity are Bank Size, Capital Adequacy, and Financial Crisis. While Interbank Rate turned out insignificant

The other study made by Vodova P (2012) aimed to identify the determinants of liquidity of commercial banks in Slovakia. In order to meet its objective the researcher considered the data for bank specific factors over the period from 2001 to 2009. The data was analyzed with panel data regression analysis and the findings of the study revealed that bank liquidity decreases mainly as a result of higher bank profitability, higher capital adequacy and with the size of bank.

In another study from Pakistan(Malik, 2013), examines bank specific and macroeconomic determinants of commercial bank liquidity in Pakistan. Their study period covers from 2007 to 2011. They have used two models of liquidity. The first model L1 is based on cash and cash equivalents to total assets. The second model L2 is based on advances net of provisions to total assets. Their results suggest that Return on Equity (ROE) have a negative and significant effect with L1. Capital adequacy (CAP) have negative and significantly correlated with Liquidity. The central bank regulations greatly affect the liquidity of commercial banks which means tight monetary policy can regulate the undesirable effect of inflation on liquidity.

The study made by Malik (2013)with the aim of identifying the determinants of liquidity of Hungarian commercial banks which cover the period from 2001 to 2010 and used panel data regression analysis. The result of the study showed that bank liquidity is positively related to capital adequacy of banks, interest rate on loans and bank profitability and negatively related to the size of the bank, interest rate margin, monetary policy interest rate and interest rate on interbank transaction.

2.5.3 Related Empirical Studies in African Countries

Agbada(2013)studied the efficacy of liquidity management and banking performance in Nigeria using survey research methodology. Data obtained were first presented in tables of percentages and pie charts. The data were empirically analyzed by Pearson product-moment correlation coefficient. Findings from the empirical analysis were quite robust and clearly indicate that there is significant relationship between efficient liquidity management and banking performance and that efficient liquidity management enhances the soundness of a bank.

A study made by(Fadare, 2011), on the banking sector liquidity and financial crisis in Nigeria with the aim of identifying the key determinants of banking liquidity and assessing the relationship between determinants of banking liquidity and financial frictions within the economy. It was employed a linear least square model and time series data from 1980 to 2009. The study found that monetary policy rate and lagged loan-to-deposit ratio were significant for predicting banking sector liquidity. It also showed that a decrease in monetary policy rate, volatility of output in relation to trend output, and the demand for cash, leads to an increase in current loan-to-deposit ratios; while a decrease in currency in circulation in proportion to banking sector deposits; and lagged loan-to deposit ratios leads to a decline in current loan-to-deposit ratios.

The other study made by Mohamed (2015) on Tunisia banks shows that, financial performance, capital to total assets, operating costs to total assets, growth rate of GDP, inflation rate, delayed liquidity have significant impact on bank liquidity while size, total loans to total assets, financial costs to total credits, total deposits to total assets does not have a significant impact on bank liquidity.

2.5.4 Related Empirical Studies in Ethiopia

As to the author's knowledge, Yimer(2016)has done related paper on "Determinants of Liquidity in Commercial Banks of Ethiopia: The Case of Selected Private Banks". Thedata that this researcher used was collected from a sample of six private commercial banks in Ethiopia over the period from 2000 to 2015. Bank specific and macroeconomic variables were analyzed by using the balanced panel fixed effect regression model. Bank's liquidity is measured in three ratios: liquid asset to deposit, liquid asset to total asset and loan to deposit ratios. The findings of the study revealed that, bank size and loan growth has negative and statistically significant impact on liquidity; while non-performing loans, profitability and

inflation have positive and statistically significant impact on liquidity of Ethiopian private commercial banks. However, capital adequacy, interest rate margin, real GDP growth rate , interest rate on loans and short term interest rate have no statistically significant effect on the liquidly of Ethiopian private commercial banks.

Tseganesh(2012),studied "the determinants of banks liquidity and their impact on financial performance on commercial banks in Ethiopia including both public and private banks". Her study focused on two steps; first, to identify determinants of commercial banks liquidity in Ethiopia and then to see the impact of banks liquidity up on financial performance through the significant variables explaining liquidity. The data was analyses by using balanced fixed effect panel regression model for eight commercial banks in the sample covered the period from 2000 to 2011 and the result of her study indicate that capital adequacy, bank size, share of non-performing loans in the total volume of loans, interest rate margin, inflation rate and short term interest rate had positive and statistically significant impact on banks liquidity. Whereas, Real GDP growth rate and loan growth had statistically insignificant impact on banks liquidity.

Assfaw(2019), worked on the title of "Firm-Specific and Macroeconomic Determinants of Banks Liquidity: Empirical Investigation from Ethiopian Private Commercial Banks". This study aimed to examine the firm-specific and macroeconomic variables which can affect the liquidity position of private commercial banks in Ethiopia. For the current study, secondary data were extracted from audited annual financial reports of eight purposefully selected private commercial banks covering the period of 2011-2017. The panel data was analyzed by adopting the balanced panel fixed effect regression model. The study revealed that firm (bank) specific factors namely the size of banks, loan growth and deposit are found to be significant determinants of the banks' liquidity. Moreover, macroeconomic determinants consisting of interest rate margin, national bank bills purchase, GDP and annual inflation have a significant influence on the liquidity of private commercial banks of Ethiopia.

BerihunEngida (2015)the researcher has done on "Determinants of Banks Liquidity and their Impact on Profitability: Evidenced from eight commercial banks in Ethiopia "In order to achieve the objective a secondary sources of data were collected from eight commercial banks in the sample covering the period from 2002/03 to 2013/14 and analyzed them with panel data regression analysis. The results of regression analysis showed that Bank size and Loan had negative and statistically significant impact on banks liquidity measured by Liquid

asset to total Asset. Real growth rate of gross domestic product on the basis price level, Interest rate on lending ,Non-performing loans in the total volume of loans, Bank size, Actual reserve ration and short term interest rate had positive and statistically. Among the statistically significant factors affecting banks liquidity bank size had positive and statistically significant impact on Profitability whereas, growth rate of gross domestic product on the basis price level, Actual reserve rate and Non-performing loans in the total volume of loans had negative impact on profitability. By analyzing and identifying their measurement models and the number of variables that those listed researcher explained on determinants of liquidity. Therefore the aim of this study is to fill the above stated gap through analyzing firm specific and macroeconomic determinants of the selected private commercial banks in Ethiopia. The period of this study became recent from period (2005-2020) and including new variables. Finally, providing fullinformation about the relationshipbetween liquidity andfirmspecific and macroeconomic determinants of banks liquidities in the recent data was essential for this study

CHAPTER THREE

RESEARCH METHEDEOLOGY

3.1. Research Design

It is a paramount to properly define and evaluate the research design before conducting the research since aresearch design provides an important framework & guidelines on how to collect and analyze data.According to(Creswell, 2009) there are three basic research approaches; these are quantitative, qualitative and mixed research approaches. The quantitative data research relies on the measurement and analysis of statistical data to produce quantifiable conclusions. Quantitative research is a means for testing objective theories by examining the relationship among variables (Creswell, 2009). Therefore, for this study quantitative research approach is used to see the relationship between the liquidity of private commercial banks and the bank specific and macroeconomic factors affecting banks liquidity in Ethiopia by establishing causal relationship. This study also adopted an explanatory approach by using balanced panel research design to meet the research objective. As explained by (Bhattacherjee, 2012), explanatory research attempts to identify causal factors and outcomes of the target phenomenon. On the other hand according to (Brooks, 2008), a panel of data has embodied information across both time and space and it measures some quantity about them over time.

The advantage of using panel data is to address a broader range of issues and tackle more complex problems than would be possible with pure time-series or pure cross-sectional data alone. Panel data has also 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, which captures dynamic adjustment (Brooks, 2008)

3.2 Source of data

To carry out research activity information should be gathered from appropriate sources. Consistent and truthful research indicates that the research conducted by using appropriate data collection instruments that increase the credibility and value of research findings (Yimer, 2016), The sources of data for this research weresecondary sources. Bank specific data were collected from audited financial statements (i.e. Balance Sheet and Profit & Loss Statement) of each selected commercial banks included in the sample and macroeconomic data were collected from NBE. The data were collected from 2005 to 2020 on annual base.

3.3. Study Population and Sampling Frame

This study had target on all population of the banking sector in Ethiopia. According to NBE annual report (2020), the number of banks operating in Ethiopia remained at 19 of which 17 were private and 2 state owned. They are: Commercial Bank of Ethiopia (CBE), Construction and Business Banks(CBB), Dashen Bank S.C (DB), Awash International Bank S.C (AIB), Wegagen Bank S.C (WB), United Bank S.C (UB), Nib International Bank S.C (NIB), Bank of Abyssinia S.C (BOA), Lion International Bank S.C (LIB), Cooperative Bank of OromiaS.C (CBO), Berehan International Bank S.C (BIB), Buna International BankS.C (BUIB), Oromia International Bank S.C (OIB), Zemen Bank S.C (ZB),Abay Bank(AB),Addis International Bank(ADIB), Debub Global Bank(DGB),Enat Bank (EB) and Zamzam Bank (ZB). Since the study analyses more depend on the secondary data obtained from NBE annual report and Balance sheet as well as availability of other related articles and journals, it is manageable to include sixteen years of selected banks. Seven private commercial banks were selected out of the population given.The justification for using sixteen years of data is to increase the number of observation.

3.4. Sampling Technique and Sample Size

Sampling provides an effective alternative when it is difficult to survey the entire population and when there is budget and time constraint to surveying the entire population (Brynjolfsson, 2009).Some researchers collect data for the entire population as it can be manageable and data is available, while for some other researches data is collected on sample base. Basically there are two types of sampling techniques; probability or representative sampling and non-probability or judgmental sampling. In the probability sampling, the chance or probability, of each case being selected from the population is known and is usually equal for all cases while in the non-probability sampling, the probability of each case being selected from the total population is not known (Brynjolfsson, 2009).

The sampling technique used in this research was a non-probabilistic sampling and among the non-probability sampling methods, this research used purposive sampling. As stated byBrynjolfsson(2009), purposive sampling is often used when working with small samples and when the researchers wish to select cases that are mainly informative. Thus the researcher used purposive sampling by considering the availability of full data for the selected time period. In Ethiopia, there are seventeen private banks and two public banks which totally nineteen commercial banks as per NBE (2020). Among the seventeen private commercial banks, seven of them have more than sixteen years of data. These banks are;

Cooperative Bank of Oromia, Awash International Bank, DashenBank,Bank of Abyssinia, Wegagen Bank, NIB International Bank and United Bank. In order to havebalanced panel data for sixteen years, those private commercial banks which have less than sixteen years in operation are not selected for this study.

3.5. Methods of Data Analysis

After the data wascollected, it was organized and financial ratios have been computed for each bank of each bank specific variables. And then, the next step have been analyzing and interpreting them accordingly to achieve the stated objectives. In this study two type of statistical analysis was used to test the proposed hypotheses. Those were descriptive statistics and inferential statistics/multiple regression analysis to see the effect and relationship of explanatory or independent variables on the dependent variable. The descriptive statistics of both dependent and independent variables will be calculated over the sampled periods. This helps to convert the raw data in to a more meaning full form which enables the researcher to understand the ideas clearly.

3.6. Variable Definition & Hypotheses of the Study

This study had focused on identifying the determinants of banks liquidity in Ethiopian private commercial banks through testing the hypotheses regarding to the relationships between liquidity of banks and bank specific and macroeconomic factors affecting it. It is obvious that the most important task were to select the appropriate explanatory variables. Though various bank specific and macro-economic variables were conducted in the previous studies madein worldwide, in this study some variables (bank specific and macroeconomic) areincluded. This study was also specifically considered which determinant factors could be influence the liquidity of private commercial banks in Ethiopia.Therefore, the following variables were selected based on Ethiopian context and previous relevant studies. The description and working definition of selected variables were discussed here under.

3.6.1. Dependent Variables

Liquidity of Bank

According to Bank for International Settlements (2008) liquidity is "the ability of bank to fund increases in assets and meet obligations as they come due, without incurring unacceptable losses. Liquidity can also be defined as a measure of the relative amount of asset in cash or which can be quickly converted into cash without any loss in value available to meet short term liabilities. The liquidity measure provides suggestions about the level of

liquidity on which the commercial banks are operating. There are two approaches to measure liquidity. The first approach, liquidity ratio, uses different balance sheet ratios and it is easy to compute whereas, the second approach, funding gap, is the difference between inflows and outflows which is difficult to measure because it is more data intensive and there is no standard technique to forecast inflows and outflows.

Most academic literatures favor liquidity ratio due to a more standardized method and therefore, this study is intended to use liquidity ratios, to measure liquidity of private commercial banks, due to the accessibility of data. For the purpose of this study, the following liquidity ratios, which are most of the time used by the National Bank of Ethiopia to manage liquidity requirements and which were previously used by(Mugenyah, 2015), (Yimer, 2016),(Vodov{'a}, 2011), (Tseganesh, 2012), (Chagwiza, 2014)are adopted.

Loans to deposit (LDR)

As per NBE directive No SBB/43/20017, loans & advances means any financial asset of a banks arising from a direct or indirect advances fund by a bank to a person that is conditioned on the obligation of the person to repay the fund on a specified date or on demand with interest. Loans & Advances are the major portion of a bank's asset and it is the most earning asset of a bank.

This ratio tells us the percentage of funding sources tied up by illiquid asset. It relate illiquid asset with liquid liability. This ratio also indicates the percentage of deposit locked in to illiquid asset. The ratio reflects the proportion of the customers' deposits that has been given out in the form of loans and the percentage that is retained in the liquid forms(Yimer, 2016). The ratio serves as a useful planning and control tool in liquidity management since commercial banks use it as a guide in lending and investment decision. In liquiditymeasurement, the higher this ratio, the less the liquidity of the bank is and interpreted inversely.

$$\text{LDR (loan to deposit ratio)} = \frac{Total\ Loan}{Total\ Deposit}$$

3.6.2. Independent Variables
This section describes the independent variables that were used in the econometric model to estimate the dependent variable i.e. liquidity of private commercial banks in Ethiopia

Capital Adequacy of Banks (CAP)

Capital is the amount of own fund available to support the bank's business and act as a buffer in case of adverse situationAthanasoglou, (2006). Capital of a bank includes paid up capital, undistributed profit (retained earnings), legal reserve or other reserves and surplus fund which are kept aside for contingencies. Regulators in most countries define and monitor CAP to protect depositors, thereby maintaining confidence in the banking system. Though capital adequacy ratio is measured by the ratio of total capital to risk weight asset, in some literatures it can be also measured by the ratio of capital to total asset and then in this study, the proxy for capital adequacy is the ratio of total capital of the bank to total asset of the bank. This ratio measures how much of banks asset are funded with owners funds and is a proxy for the capital adequacy of a bank by estimating the ability to absorb losses. As it is discussed in the literature review part, there are two opposing theoretical views regarding to the relationship between banks liquidity and capital adequacy. Some previous studies such as the "financial fragility-crowding out" theories predicts that higher capital reduces liquidity creation (D. W. a. R. Diamond, Raghuram G, 2001) and hence, there is negative relationship between capital adequacy and bank liquidity whereas,

Al-Khouri(2012)found that, bank capital increases bank liquidity through its ability to absorb risk and thus the higher is the bank's capital ratio; the higher is its liquidity creation. This study considered the second assumption and expected as capital adequacy has a positive relationship with bank liquidity.

Size of the Bank

The bank's total asset is another bank specific variable that affects the liquidity of a bank. Bank size measures its general capacity to undertake its intermediary function. There are two opposing arguments regarding to the relationship between bank liquidity and bank size. The first view is the "too big to fail" hypothesis which considers negative relationship between bank size and liquidity whereas; the second view considers there is a positive relationship between bank size and liquidity. In this study, bank size is measured by the natural logarithm of total asset of the bank and it is expected positive relationship between bank size and liquidity depending on the second argument of the above statement.

Loan

As per NBE directives NoSBB/43/2008, loans & advances means any financial asset of a bank arising from a direct or indirect advances fund by a bank to a person that is conditioned

on the obligation of the person to repay the fund on a specified date or on demand with interest. Loans & advances are the major earning asset of the bank. Loans & advances are granted to customer from the amount collected from depositors of the bank. In this regard, when banks transform short term deposits to long term loans, which have a maturity mismatch, they will be vulnerable to liquidity problem. Therefore, the increase in loan means increase in illiquid assets and decrease in short term/liquid assets. As it was discussed in the literature review part, it is expected that, there is a negative relationship between bank loan and liquidity. For this study loan growth is measured by the annual growth rate of outstanding gross loans & advances of the bank.

Bank Deposit

Deposit is highly determining the position of the banks' liquidity. The demand for liquidity may arrive at an inconvenient time and force the fire-sale liquidation of illiquid assets. It is measured by total deposits to total assets ratio. The study of(Shah, 2018), indicated that deposit measured by share of deposit to total asset has a statistically negative effect on the level of liquidity. But, other studies revealed that deposits had a positive and statistically significant effect on bank liquidity, means as demand deposits increase, liquid assets holdings also increase (Mazreku, 2019). In this study deposit expected to have positive effect on private bank liquidity of Ethiopia.

Profitability of the Bank (ROA)

Liquidity needs constrain a bank from investing its entire available fund. Banks need to be both profitable and liquid which are inherently conflicts between the two and the need to balance them. As more liquid asset is investing on earning assets such as loans & advances, profitability will increase by the expense of liquidity. As a result, banks should always strike a balance between liquidity and profitability to satisfy shareholders" wealth aspirations as well as liquidity requirements. The study made by Tseganesh(2012), evidence that, there is a trade-off between profitability and liquidity in that, the increase in either one would decrease the other. The other study made by Vodova (2013)suggest a negative influence on bank profitability (measured by return on equity) and bank liquidity. Most commonly, profitability is measured by return on asset (ROA) and return on equity (ROE). For the purpose of this study, the proxy of profitability is return on asset that measures the overall financial performance of banks and the return on asset (ROA) is measured by the ratio of net profit

after tax to total asset. In this study profitability expected to have positive relationship with private banks liquidity

Gross Domestic Product (GDP)

GDP is an indicator of the economic health of a country as well as the gauge of a country's standard of living. It is the measurement of level of economic activity of a country. According to previous studies, when the economy is at boom or goes out of recession, economic units including banks are optimistic and increase their loans & advances and as a result decrease their holding of liquid assets. On the other hand, during recession, business operations reduce borrowers" capability to service their obligations which increases banks NPLs and eventually decreases banks liquidity. For the purpose of this study, GDP is measured by the annual real growth rate of gross domestic product and it is hypothesized to affect banking liquidity negatively.

Interest Rate Margin (IRM)

Interest rate margin is one of the most important factors that measure the efficiency of financial institutions. Interest rate margin is the difference between the gross cost paid by a borrower to a bank and the net return received by a depositor(Brock, 2000). According toAzeez (2013), interest rate margin is defined as the difference between interest income from loan and advances as a fraction of the total loans and advances and the interest paid out on deposit as a percentage of total deposits. In the financial intermediation process, a bank collects money on deposit from one group (the surplus unit) and grants it out to another group (the deficit unit). These roles involve bringing together people who have money and those who need money. In such intermediation function, the bank will earn interest from loans & advances and pay interest for depositors. Thus, how well a bank manages its assets and liabilities is measured by the spread between the interest earned on the banks assets and interest costs on its liabilities. According to the liquidity preference theory, lenders need high interest rate which includes the liquidity premium in order to lend. The basic idea underlining this theory is that, lenders of funds prefer to lend short, while borrowers generally prefer to borrow long. Hence borrowers are prepared to pay interest rate margin to a liquidity premium to lenders to induce them to lend long. The size of interest rate margin to liquidity premium increases with the time to maturity. Therefore, as they got higher premium, lenders give up their liquid money(Pilbeam, 2005). Higher interest rate margin will force banks to lend more and reduce their holding of liquid assets. On the other hand, holding of liquid asset reduce

the risk that banks may face liquidity shortage in case of unexpected withdrawals and thus as liquid assets increases, a banks liquidity risks decreases, which leads to a lower liquidity premium component of the net interest margin as cited byEmawayew (2016). Thereforein this study interest rate margin has expected to have negative and significant effect on Ethiopian private banks liquidity.

In general, the study consider the above seven independent variables as a determinant for banks liquidity of Ethiopian private commercial banks.

Table: 3.1. Description of the variables and their expected relationship

Variables	Symbol	Operational definition	Sources	Expected sign
Dependent				
Liquidity	LDR	The ratio of total loans to total deposit	Annual report	NA
Independent				
Capital adequacy	CAP	Share of equity on total asset	Annual report	+
Bank size	SIZE	Natural logarithms of total asset	Annual report	+
Loan	LO	Annual growth rate of outstanding gross loans & advances	Annual report	_
Deposit	DEP	Share of deposit to total asset	Annual report	+
Profitability	ROA	The ratio of net profit before tax to total asset	Annual report	+
Realgross domestic product	GDP	Annual real Growth rate of gross domestic product	NBE Publication	+
Interest rate margin	IRM	The difference between interest income from loan and advances as a fraction of the total loans and advances and the interest paid out on deposit as a percentage of total deposits	NBE Publication	_

As it's observed from the above table it was expected that five variables could have positive impact on bank liquidity and the rest of the factors are expected to have negative impact on bank liquidity**.**

3.7. Model Specification

Panel data involves the pooling of observations on the cross sectional over several time periods (Brooks 2008). As it was discussed in the research design section of this study, the nature of data used is a balanced panel data which was deemed to have advantages over simple cross sectional and time series data. The panel data or longitudinal data comprises of both cross-sectional elements and time-series elements; the cross-sectional element is reflected by the sample of Ethiopian private commercial banks and the time-series element is reflected in the period of study (2005-2020). This study, considered whether the use of the particular variable makes economic sense in Ethiopian private commercial banks context. The regression model used for this study was adopted from(Yimer, 2016), (Vodova P. , 2012),(Tseganesh, 2012)and (Malik, 2013).Thus, the following equation indicated the general model for this study.

$Li = \alpha + \beta X_{it} + \delta_i + \varepsilon_{it}$

Where Lit is a liquidity ratios for bank i in time t, X_{it} is a vector of explanatory variables for bank i in time t, α is constant, β are coefficient which represents the slope of variables δ_i denotes pooled OLS in bank i and ε_{it} is the error term. The subscript i denote the cross-section and t representing the time-series dimension. Therefore the general models which incorporate all of the variables to test the determinants of banks liquidity are;

$Li_{it} = \alpha + \beta_1 (CAP_{it}) + \beta_2 (SIZE_{it}) + \beta_3 (LO_{it}) + \beta_4 (De_{it}) + \beta_5(ROA_{it}) + \beta_6(GDP_t) + \beta_7 (IRM_t) + + \delta_i + \varepsilon_{it} \ldots\ldots.$(Model)

Where:

Li it: represents the banks liquidity measured by loan to deposit & short term borrowing ratio of ith bank on year "t"

CAPit: is capital adequacy ratio of ith bank on the year "t"

SIZEit: is the size of ith bank on the year "t"

Lit: is the loan of ith bank on the year "t".

DEPit: is the deposit rate of ith bank on the year" t"

ROAit: is the return on asset of ith bank on the year "t".

IRM: interest rate margin of Ethiopia on the year "t".

GDPt: is the real gross domestic product growth of Ethiopia on the year "t".

δi: denotes the pooled OLS in bank "i"

εit: is a random error term

The bank specific variables are both cross-sectional and time variant whereas the macroeconomic variables are only time variant but are converted into panel data type by including macroeconomic variables for each cross sectional unit.

Among different liquidity ratio that were not included in this study the above stated model which is measured by total loan to total deposit was selected for this study.Because most of the time this ratio was favored in order to manage the liquidity requirement directive.The researchers of this paper have expected to analysis and measure this specified ratio depending on related literature done by different researcher on the area.

3.8. Conceptual Framework

On the basis of the hypotheses that developed from the literature part and the regression model of the study, the following conceptual frame work are developed.
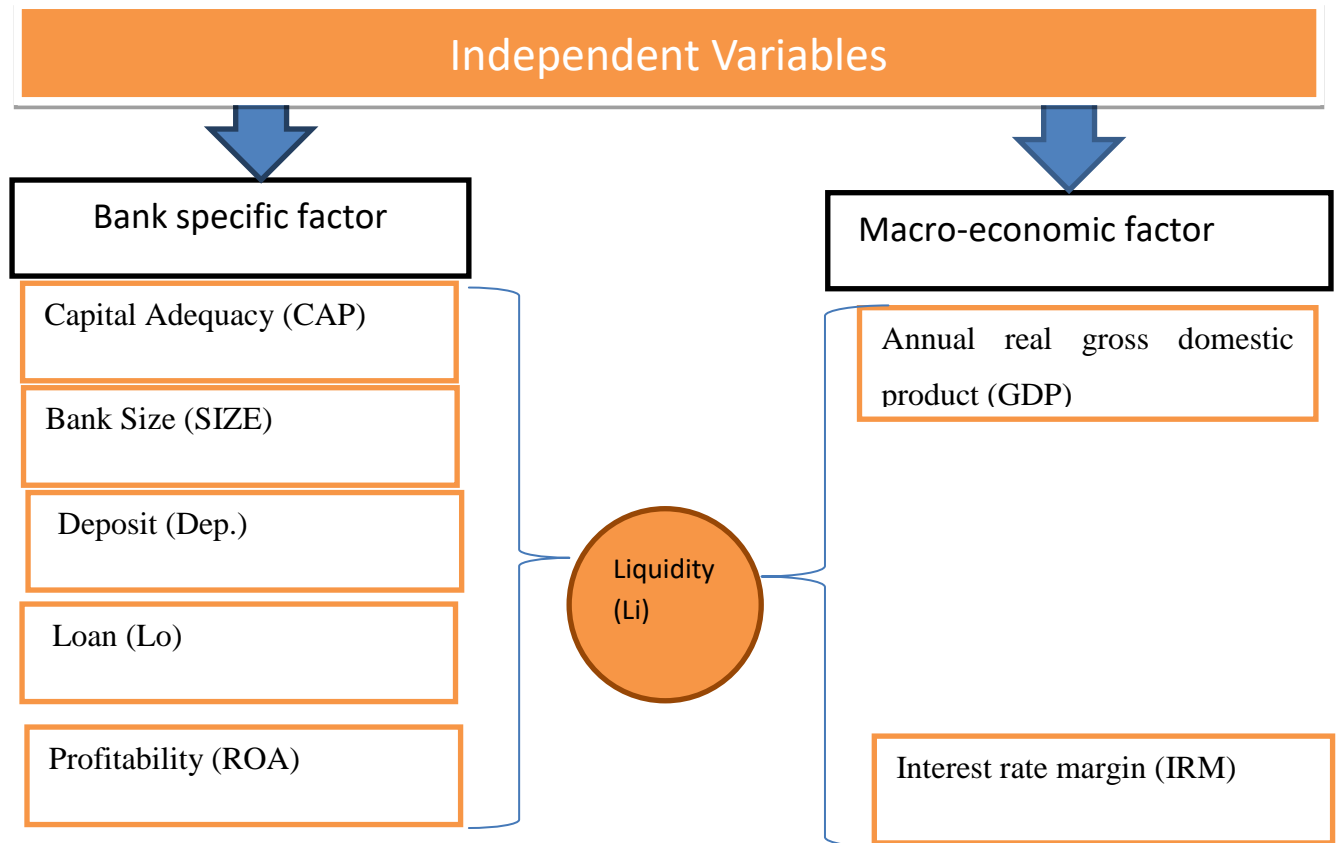

Figure 3.1 Conceptual Framework of the dependent and independent variables

This frame work is developed by the researcher of this Paper depending on reviewed literatures.

CHAPTER FOUR

DATA ANALYSIS AND INTERPRETATION

In the preceding chapter the research design employed in this study was presented and discussed in detail. Presenting result and analysing of data involved in this study was the main aim of this chapter. Accordingly, the descriptive statistics of all the variables used in this study and the results of hypothesis testing i.e. the estimated parameters of the regression equation, their significance, the connection between the independent variables and dependent variable according to the sign and the value of the parameters for the regression model were presented and discussed in detail.

4.1 Descriptive statistics

The descriptive statistics for the dependent and independent variables are presented below. The dependent variables are liquidity measured by loans to total deposit. The independent variables are: capital adequacy, Bank size, loan, Deposit, profitability (ROA) and economic variables GDP and interest rate margin. This section reports mean, maximum, minimum, standard deviation and number of observation for each variables used in this study. The banks that included in this study were all private commercial banks, those operate in the country from (2005- 2020) in order to have balanced panel data. The data for this study was drawn from seven commercial banks of already stated periods. To this end, 112 observations were analysed to examine the determinants of liquidity of private commercial banks in Ethiopia.

From those table 4.1 and 4.2 explained below, we can observe that the total number of observation in the balanced panel were 112 = (16*7). Sixteen (16) indicates number of years start from 2005 to 2020 and Seven (7) indicates number of private commercial banks operate during the period in the sample study.

4.1.1 Descriptive statistics of the dependent variables

Ethiopian private banks Liquidity is the dependent variables of this study. It measures the ability of private commercial bank to fund increases in assets and meet obligations as they come due, without incurring unacceptable losses. As described in the literature part, the two most broadlyused approaches to measure liquidity of banks are liquidity gap approach (flow approach) and liquidity ratio approach (stock approach). Even though both approaches are instinctively applying, the flow approach is more data demanding and there is no standard technique to forecast liquidity inflows and outflows. As a result, the stock approaches are

more popular in practice and in the academic literature due to the availability of a more standardized method. The most popular stock ratio which is used in this study was, loans to deposit ratio.

Table 4.1 Descriptive statistics of the dependent variables

D. variable	Obs.	Mean	Std.Dev	Min	Max
Liquidity (LI)	112	.6780989	.1397093	.2	1.295918

Source: *Fs of sampled private commercial banks and own computation through stata16*

From the above table, the mean value of Liquidity measured in total loan to total deposit was 67.9% that was above the NBE requirement before January, 2012 (i.e. 25% (Addis Fortune January 2012). The standard deviations of 13.98% show little dispersion of total loans to total deposit from its mean for the private commercial banks in Ethiopia. The maximum and minimum values of Liquidity (LI) were 129.6% and 20 % respectively.

4.1.2 Descriptive Analysis of Independent Variables

The independent variables used in this study were: capital adequacy ratio, bank size, loan, deposit, return on asset, gross domestic product (GDP) and interest rate margin. The descriptive analyses of each independent variable were discussed here below

Table 4.2 Descriptive statistics of the independent variables

Variable	Obs.	Mean	Std.Dev.	Min	Max
CAP	112	.1385737	.0863903	.0710526	.8682171
SIZE	112	23.09941	1.140837	19.22716	25.7652
LO	112`	.5058358	.0982018	.0232558	.699556
DEP	112	.7671076	.0848386	.1162791	.8715184
ROA	112	.0249411	.0091507	-.0187054	.0466862
GDP	112	.0959804	.0175918	.043	.118
IRM	112	.0704121	.0145221	.0362205	.0979117

Source: *Fs of sampled private commercial banks and own computation through stata16*

From the above table4.2 among the bank specific independent variables the mean value of capital adequacy was 13.86% which was above the international standard for capital

adequacy (i.e. 8% Reporter (13 March 2010) with the maximum and minimum values of 86.83% and 7.1% respectively. The standard deviation for CAP was 8% revealing little dispersion towards the mean among private banks in Ethiopia. Bank size was highly dispersed from its mean value (i.e. 23.09) with the standard deviation of 1.4649. The maximum and minimum values were 25.76 and 19.22 respectively.

The mean value of the variable loan was 50% with maximum and minimum values of 70% and 2.4% respectively and the standard deviation of 9%. The other bank specific factor affecting liquidity of private commercial banks was Deposit that measures total deposits to total assets ratio. The mean value of the percentage of deposit was 76.7% with the maximum and minimum of 87% and 11.63% respectively.

The mean of profitability measured by ROA is 2.49% on average, which shows that around the standard deviation of 0.9 % with -1.87% minimum and 4.67% maximum value respectively. The remaining independent variables were the macroeconomic indicators that can affect banks liquidity position over time.

The mean value of real GDP growth rate was 9.6% indicating the average real growth rate of the country's economy over the past 16 years. The maximum growth of the economy was recorded 11.8% and the minimum was 4.3%. Since the year 2005 the country has been recording double digit growth rate with little dispersion towards the average over the period under study with the standard deviation of 1.7%.

The other macroeconomic factors were related with interest rate that are interest rate margin (the difference between annual average lending and deposit rate) and short term interest rate (the annual weighted average interest rate on Treasury bill). The mean value of the interest rate margin over the period under study was 7.04% with the maximum and minimum values of 9.79% and 3.62% respectively. There was little variation of interest rate margin towards its mean value over the periods under study with the value of standard deviation 1.4%.

4.2 Correlation Analysis

The correlation between the dependant variables and the independent variables have been presented and analysed. According to Brooks (2008), correlation between two variables measures the degree of linear association between them. In other word, if it is stated that y and x are correlated, it means that y and x are being treated in a completely symmetrical way. Thus, it is not implied that changes in x cause changes in y, or indeed that changes in y cause changes in x rather, it is simply stated that there is evidence for a linear relationship between

the two variables, and that movements in the two are on average related to an extent given by the correlation coefficient. Pearson Product Moment of Correlation Coefficient was used in this study to find the association of the independent variables with dependant variables. Correlation coefficient between two variables ranges from +1 (i.e. perfect positive relationship) to -1 (i.e. perfect negative relationship) and a correlation coefficient of zero, indicates that there is no linear relationship between the two variables.

Table 4.3 Correlation matrix of the dependent and independent variables

	CAP	SIZE	LO	DEP	ROA	GDP	IRM
LI	-0.0329	-0.3064	0.8643	-0.0175	-0.1195	0.0090	-0.1996

Source: *Fs of sampled private commercial banks and own computation through stata16*

A liquidity of banks was negatively correlated with CAP with the coefficient of correlation (-0.0329). But the linear relationship between CAP and L1 was statistically not different from zero. As per private banks liquidity and CAP had statistically significant and negative linear relationship. This was in accordance with financial fragility and crowding out of deposits hypothesis and opposite to the expectation of the study.

Bank size had statistically significant and negative linear relationship with banks liquidity in Ethiopia having coefficient of correlation (-0.3064). According to the too big to fail argument, large banks would benefit from an implicit guarantee, thus decrease their cost of funding and allows them to invest in riskier assets (Iannotta, 2007).So it could affect bank liquidity negatively. Loan had positively correlated with banks liquidity measured, with the correlation coefficient of (0.8643). On the other hand, among bank specific factors Deposit had negatively correlated with liquidity with the coefficient of (-0.0175). According to the findings of Dinger (2009) cited by Abdu (2019), there is an inverse relationship between deposits and bank's liquidity. The other bank specific variable that could have correlatedwith liquidity of private bank was Profitability which has measured by ROA. It has negative and statistically insignificant with liquidity of private banks with the coefficients of (-0.1195). Result was opposing to the expectation of the study on significance. Among the macroeconomic factors affecting liquidity, real GDP growth rate has positive and significant correlation with liquidity with the coefficients of (0.0090) and interest rate margin had negative and insignificant correlation with liquidity of private commercial banks in Ethiopia with the coefficients of (-0.1996).

Among the independent variables, bank size has the highest negative correlation coefficient (-0.3064) while loan has the highest positive correlation coefficient (0.8643) with Li. On the other hand, GDP has the lowest positive correlation coefficient while deposit has the lowest negative correlation coefficient with LI.

4.3. Tests for the Classical Linear Regression Model (CLRM)

In this part, the researcher approved important analytical testing to identify for any violation of the underlining assumption of the classical linear regression model (CLRM). Four assumptions were made which ensures that the estimation technique, ordinary least squares (OLS), to have a number of desirable properties, and that hypothesis tests regarding the coefficient estimates could validly be conducted. Specifically, it was assumed that average values of the error-term is zero, the variance of the errors are constant (homoscedastic), the error-terms are normally distributed (normality) and explanatory variables are not correlated (absence of multi collinearity).The objective of the model is to predict the strength and direction of association among the dependent and independent variables. Thus, in order to maintain the validity and robustness of the regression result of the study in CLRM, it is better to satisfy basic assumption CLRM.

Testing for the Average value of the error-term is zero

The first CLRM assumption requires, the average value of the errors term should be zero. As per Brooks (2008), if a constant term is incorporated in the regression equation, this assumption will never be violated. Therefore, since the constant term was included in the regression equation, this assumption is expected to be not violated.

Testing for the variance of the error-term is constant

The other assumption of Classical linear regression model (CLRM) is that, the variance of the error-term is constant; this is known as the assumption of homoscedasticity. If the errors do not have a constant variance or if the residual of the regression have systematically changing variability over the sample, they are said to be heteroscedastic means the estimated parameter will not be BLUE because of the incompetent parameter. To test the homoscedasticity assumption the White's test was applied having the null hypothesis of heteroscedasticity. Both F-statistics and Chi-square ($\chi2$) tests statistics were applied to decide whether to reject the null hypothesis by comparing p-value with significant level.From the below stata version 16 result, the data stated has the presence of hetrocedasticity. In order to solve this problem the researcher robust Pooled OLS model as stated in Appendix 2.

```
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
        Ho: Constant variance
        Variables: fitted values of li

        chi2(1)       =      65.73         .
        Prob > chi2  =      0.0000
```

Source: *stata version 16 results of sample private commercial banks*

Normality Test

According to (Lim, 2008)one of the most commonly applied test for normality is the Bera-Jarque (BJ) test. The entire distribution is characterized by the mean, variance, skewness and kurtosis. Skewness measures the extent to which a distribution is not symmetric to its mean value and kurtosis measures how fat the tails of the distribution are(Lim, 2008).
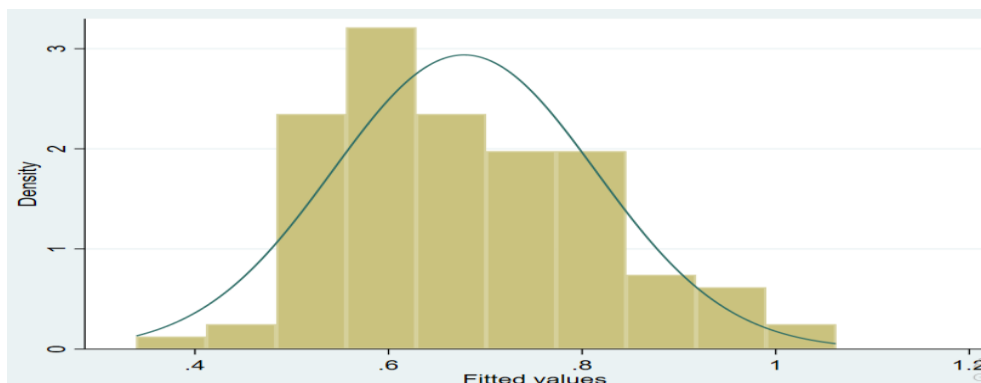
Source: *stata version 16 results of sample private commercial banks*

Figure4.1Histogram

Thus a normal distribution is not skewed and is defined to have a coefficient of kurtosis of three and a coefficient of excess kurtosis of zero. If the residuals are normally distributed, the histogram should be bell-shaped and BJ statistic would not be significant. The p-value of the normality test should be bigger than 0.05 to not reject the null of normality at 5% level.

Table 4.4 Normality test

| | Skewness/Kurtosis tests for Normality | | | | |
Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	Prob>chi2
residual	112	0.0402	0.8607	4.35	0.1138

Source: *stata version 16 results of sample private commercial banks*

In this study, as shown here above, kurtosis approaches to three which were 3.50 for Li. On the other hand the p value was 0.1138 which is not significant even at 10% level of significant to reject the null hypothesis. Thus the result of the test implies that the data were consistent with a normal distribution assumption.

Test for Multicollinearity

The general linear model strength depends on the hypothesis of independence of each independent variable. If this condition is not met, then the general linear model is not applicable and cannot be considered suitable for the process of information estimation. Therefore, The Variance Inflation Factor (VIF) and tolerance are both widely used measures of the degree of multicollinearity of the independent variable with the other independent variables in a regression model (O'Brien, 2017).

There is severe multi collinearity if VIF is equal or more than 10, whereas, there is no serious multi collinearity if VIF is less than 10 or equal to 1 (Kwak, 2015).

To test multicollinearity between study independent variables a multi collinearity statistics test has been done for liquidity as shown below.

Table 4.5Test for multicollinearity

Variable	VIF	1/VIF
CAP	**9.00**	0.111108
DEP	7.67	0.130372
SIZE	2.13	0.468993
GDP	1.87	0.535336
ROA	1.62	0.617458
IRM	1.45	0.688640
LO	1.34	0.747921
Mean VIF	**3.58**	

Source: *stata version 16 results of sample private commercial banks*

According to the table above, (VIF) Values for the Independent variables are below nine (9) thus they were lower than the cut-off value of 10, which shows there is no linearity problem among study explanatory variables.

Choosing Random effect (RE) versus fixed effect (FE) models

According to (Gujarati, 2004), if T (the number of time series data) is large and N (the number of cross-sectional units) is small, there is likely to be little difference in the values of the parameters estimated by fixed effect model/FEM and random effect model/REM. Hence the choice here is based on computational convenience. On this score, FEM may be preferable. Since the number of time series (i.e. 16 year) is greater than the number of cross sectional units (i.e. 7 commercial banks) and also FEM is preferable in case where the number of explanatory variables exceeds the cross-sectional data.However since the p value is greater than 0.05 further model specification test was undertaken.The Housman model specification test was conducted and then after, probability of significance became 1, due to this the researcher used pooled OLS model for this study.

4.4. Results of Regression Analysis

This section discusses the regression results of pooled OLS model that determines the liquidity of private commercial banks in Ethiopia.The empirical model used in this study to

identify the statistically significant determinants of Ethiopian private commercial banks liquidity, measured by total loan to total deposit;

LI it = α + β1 (CAPit) + β2 (SIZEit) + β3 (LOit) + β4 (DEPit) + β5 (ROAit) + β6 (GDPt) + β7(IRM) +δi + εit ……….(Model Li)

The following table shows the regression result of the determinants of commercial banks liquidity measured by the ratio of total loan to total deposit

Table 4.6The regression result of the determinants of commercial banks

```
    Source |       SS          df       MS            Number of obs   =        112
-----------+----------------------------------        F(7, 104)       =     255.37
     Model |  2.0474537         7   .292493386        Prob > F        =     0.0000
  Residual |  .119119319      104   .001145378        R-squared       =     0.9450
-----------+----------------------------------        Adj R-squared   =     0.9413
     Total |  2.16657302      111   .019518676        Root MSE        =     .03384
```

Li	Coef.	Std.error	T	P>/t/	[95%conf.)	Interval
CAP	-.2581979	.1115515	-2.31	0.023**	-.4794087	-.0369871
SIZE	-.0234954	.0041116	-5.71	0.000***	-.0316488	-.015342
LO	1.4227	.0378239	37.61	0.000***	1.347694	1.497707
DEP	-.8878194	.1048643	-8.47	0.000***	-1.095769	-.6798697
ROA	-.5922669	.4467402	-1.33	0.188	-1.47817	.2936357
GDP	-.3115973	.2495687	-1.25	0.215	-.80655013	.1833068
IRM	-.1428272	.2665551	-0.54	0.593	-.6714159	.3857616
_CONS	1.27274	.140324	9.07	0.000	.9944757	1.551012

***, **, and * denote significance at 1%, 5%, and 10% levels, respectively

Source: *own computation of stata version 16 results of sample private commercial banks*

Theabove table 4.6.presents the determinants of Ethiopian private commercial banks liquidity measured by the ratio of loans to deposit. High value of this ratio implies low liquidity and the result have to be interpreted in reverse: positive sign of the coefficient means negative impact on liquidity and conversely. As it is depicted in the above table, the R-square and adjusted R-square of the model was 0.9450 and 0.9413 respectively. This result implies that, the explanatory power of the model is high and indicates that the change in the independent variables can describe 94.13% of the change in the dependant variable of the study. The R-square result makes sense because there might be other factors which are not included in the model but could help in explaining liquidity in private Ethiopian commercial banks. Those factors can account for the remaining 5.87%.

The value of F-statistics is 255.37 with p-value of 0.0000 which is used to measure the overall significance of the model. On the other hand F-statistics tests the fitness of the model and a recommended F-statistics should be higher than 5 for it to be considered fit. Thus, the p-value of F-statistics is zero at four digits, the null hypothesis is rejected and the model is significant even at 1% significant level.

As it can be seen from the above table, bank size (SIZE), loan (LO) and deposit (DEP) were statistically significant at 1% significant level. Capital adequacy was statistically significant at 5% significance level. Whereas, return on asset, gross domestic product and interest rate margin had statistically insignificant impact on banks liquidity measured by the model.

As it is shown on the above table, among the independent variables, capital adequacy, bank size, deposit, return on asset, gross domestic product, interest rate margin, had negatively related with liquidity measured by the model and indicate their positive impact on liquidity of Ethiopian private commercial banks which means the increase in this independent variables will leads to the decrease in liquidity of commercial banks. The other variables loan, had positively related with liquidity which is measured by total loan to total deposit ratio and have negative impact on liquidity. The coefficient sign of capital adequacy, bank size, and return on asset, Deposit, and GDP were in-line with our expectation whereas the coefficient sign of the other independent variables were contrary to our expectation.

4.5. Discussion of the Regression Results

In this section, the relationship between the dependent variable and each independent variable were discussed on the basis of the findings on this study. The dependant variables were liquidity of Ethiopian private commercial banks, which was measured by; total loans to total

deposit ratio. And the independent variables were: capital adequacy, size of the bank, loan, deposit, and return on asset, gross domestic product, and interest rate margin. Thus, the regression result of each bank specific and macroeconomic variables were discussed here under.

Capital Adequacy and Bank's Liquidity

According to this study, capital adequacy was measured by the ratio of total capital of the bank to total asset of the bank and it was hypothesized that capital adequacy has positive and significant impact on bank's liquidity. Based on the regression result, capital adequacy was negative and statistically significant impact on the determination of liquidity of Ethiopian private commercial banks with the coefficients of -0.258 since it should be inversely interpreted, it has positive impacts on private bank liquidity. This coefficient sign of (-0.258) reveals that, there is a positive relation between liquidity of private commercial banks measured by total loan to total deposit. This indicates that, when capital to total asset is increases by 1 unit, the liquidity of Ethiopian private commercial banks is increased by -0.258 units, being other variables remains constant. This result is similar with our hypothesis and the coefficient sign was also in the same direction with our expectation. The researcher finding is consistent with (Belete, 2015), (Molla, 2017), (Diamond, 1983) and(Vodova, (2013). The result is inconsistent with (Yimer, 2016), (Tekle, 2019) and (Melese, 2015)

In general, capital adequacy has positive and statistically significant impact on liquidity of Ethiopian private commercial banks as it was measured by liquidity ratio and thus the first hypothesis; capital adequacy has positive and significant impact on banks liquidity can't be rejected in our findings.

Size of banks and BankLiquidity

The proxy for bank size in this study was the natural logarithm of total asset and expected as bank size has positive and significant impact on banks liquidity. According to the result of this study bank size had a positive and statistically significant effect on liquidity of Ethiopian private commercial banks which was measured by total loans to total deposit, at 1% significant level. The negative sign of the coefficient indicates a positive relationship between bank size and banks liquidity, since liquidity was measured by loan to deposit ratio which reveals the negative impacts on the overall liquidity of private banks. This finding is opposite with the well-known "too big to fail" hypothesis and seems that if big banks assuming themselves as "too big to fail", their incentive to hold liquid asset is limited. According to the

"too big to fail" argument, large banks would benefit from an implicit guarantee, thus decrease their cost of funding and allows them to invest in riskier assets(Iannotta, 2007).

Being other variables held constant, a one unit change on bank size had resulted in a (-0.0234) units change on liquidity of Ethiopian private commercial banks in similar direction. This was inconsistent with the findings of Vodova(2011) on Hungary Commercial banks. Vodova (2013) ,on Poland Commercial Banks andYimer (2016)on Ethiopian private banks and but opposite to the findings of (Malik, 2013)on Pakistan commercial banks, (Molla, 2017)and (Tseganesh, 2012) in Ethiopian commercial banks.It's consistent with the findings of (Melese, 2015). Thus, the hypothesis: bank size has positive and significant impact on banks liquidity should not be rejected.

Loan and Bank's Liquidity

As lending is the principal business activity of commercial banks, loans & advances is the major asset of a bank. The result of the study indicated that, loan had a positive and statistically significant impact on liquidity of Ethiopian private commercial banks measured by total loan to total deposit at 1% significant level and it should interpreted inversely with the overall liquidity of private banks. Due to this according to the finding of this study bank size has negative and significant impacts on bank liquidity. The negative relation and statistically significant impact of loan on liquidity was opposite with the result expected.

This negative relation of the coefficient indicates a direct relationship between loan and liquidity. According to the regression result, a one per cent change in the loan rate, keeping other things constant, had resulted in 142% change on the level of liquidity of commercial banks measured by total loans to total deposit. This is dissimilar with the finding of(Melese, 2015), and consistent with the result of(Tseganesh, 2012), and(Yimer, 2016). Therefore, the hypothesis saying, loan growth has negative and statistically significant impact on banks liquidity rejected should not be rejected.

Deposit and Bank's Liquidity

Deposit is highly determining the position of the banks' liquidity. The demand for liquidity may arrive at an inconvenient time and force the fire-sale liquidation of illiquid assets. It is measured by total deposits to total assets ratio. The result of the study indicate that deposit had a negative and statistically significant impact on liquidity of Ethiopian private commercial banks measured by total loan to total deposit at 1% significant level which have to be interpreted inversely. The positive relation and statistically significant impact of deposit

on liquidity was similar with the result expected.The estimation result of the pooled OLS indicates that a one ETB increase in banks deposit will have increasing effect of (0.08878)cents on banks liquidity measured by total loan to total deposit. This means, if the majority of the depositors of the bank are business firms, corporations, schools, college etc., the bank will

have to maintain high liquidity because of unpredictable.This is dissimilar to the finding of,(Assfaw, 2019), (Shah, 2018)(Mazreku, 2019)and(La, 2017).

Thus, the hypothesis: deposit has positive and significant impact on banks liquidity should not be rejected.

Profitability and Bank's Liquidity

In this studyProfitability was measured by the return on asset (ROA). The regression result shows that, profitability had a positive and statistically insignificant impact on liquidity measured by total loans to total deposit and its insignificant impact on Ethiopian private bank liquidity. The insignificance of ROA on liquidity was inconsistent with our expectation and finance theory which emphasizes their significant consequence. The coefficient of (-0.592) revealed that, taking other independent variables constant, a one per cent increase on return on asset had a 59.2% increase on liquidity of Ethiopian private commercial banks since it inversely interpreted. This negative relation shows that, higher profitability leads to higher banks liquidity insignificantly. As the major profitability of banks comes from loans and advances and in return the increase on loans leads to an increase in liquid asset, In general, the result of this study was inconsistent with the findings of(Vodova, (2013), on Poland and Slovakia commercial banks respectively and consistent with the findings of (Belete, 2015) . Therefore, the hypothesis stated; profitability has negative and significant impact on banks liquidity should be rejected.

GDP Growth Rate and Bank's Liquidity

One of the macroeconomic variables that affect liquidity of commercial banks in Ethiopia was real gross domestic product (GDP) and it was measured by the real growth rate. As per the regression result, GDP had negative and statistically insignificant impact on liquidity of selected Ethiopian private banks which interpreted inversely. This result is inconsistent with Valla et al. (2006), Dinger (2009), Vodova (2011)and Aspachs O(2005), which established negative relationships between the two. According to (Aspachs O. a., 2005), UK banks seemed to hold smaller amounts of liquidity when GDP increased and vice versa. This

implies that in a boom of the economy private commercial banks is more liquid than in the recession time. It has also statistically insignificant impact on liquidity. Hence, the hypothesis stating; real GDP growth rate has positive and significant impact on banks liquidity should not be accepted.This implies that during the study period, the growth rate of GDP of Ethiopia do not have impact on the liquidity of Ethiopian private commercial banks. Hence, the hypothesis stating; real GDP growth rate has positive and significant impact on banks liquidity should be rejected.

Interest Rate Margin and Bank's Liquidity

According to this study Interest rate margin (IRM) was measured by the difference between interest income on loan and advances as a fraction of total loan and advances and the interest paid out on deposit as a fraction of total deposits. According to the regression result of this study, interest rate margin had negative and statistically insignificant impact on liquidity of private commercial banks which have to be interpreted with liquidity measured by deposit ratio. The positive effect of interest rate margin highlights the fact that higher interest rate margin encourage banks to hold liquid asset more and more rather it encourage banks to lending. The coefficient of (0.1428) indicated that, a one per cent change on interest rate margin leads to 14.28% change on liquidity of Ethiopian private commercial banks measured by loan to deposit ratio in the similar direction. The result was inconsistent with the findings of (Assfaw, 2019) and (Belete, 2015). Though its coefficient is inversely interpreted its similar with the expected result, it's statistically insignificant impact on liquidity was opposite to the researcher hypothesis and expectation and thus the hypothesis stated; Interest rate margin has negative and significant impact on banks liquidity should be rejected.

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CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

In the previous chapter analysis of the findings was presented well and this chapter deals with the major conclusions and recommendations depending on the findings of the study. The chapter is organized into three sub-sections, the first section presented the summary of the paper and the second section deals with the conclusion and the third present's major recommendation of the study resulted from the study.

5.1 Summary

The main objective of this study was to identify the determinants of liquidity of private commercial banks in Ethiopia. In order to achieve the research objectives, secondary data were collected from a sample of seven private commercial banks in Ethiopia over the period from 2005 to 2020. Bank specific and macroeconomic variables were analysed by using the pooled OLS regression model. Banks should remain liquid at all times to prevent falling into liquidity crisis, which cause crisis among the stakeholders in the overall economy. Thus, this study attempts to identify the determinants of liquidity of selected private commercial banks in Ethiopia. This research also provides summary of previous studies on similar topics. Seven variables that determine the selected private commercial banks liquidity were chosen and analysed. Panel data was used for the sample of seven commercial banks in Ethiopia from the year 2005 to 2020 GC and estimate using pooled OLS model (POLS). Data was presented by using descriptive statistics and inferential statistics. The balanced correlation and regression analysis for liquidity conducted. Statistical analysis made for seven determinants of selected private commercial banks liquidity. From the list of possible explanatory variables, many of them proved to be statistically significant while some are not statistically significant. Depending on the results from the regression analysis estimated by pooled OLS regression model, the following conclusion was made.

5.2 Conclusions

Identifying the macroeconomic and bank specific determinants of Ethiopian private bank liquidity has been the main objective of this study. In order to comply with the objectives of the study, five bank specific and two macroeconomic variables were used. The bank specific variables include; capital adequacy, bank size, loan, profitability (ROA), and the macroeconomic variables were real GDP and interest rate margin. The study was used panel data for the sample of seven private commercial banks in Ethiopia which had sixteen years of

banking service over the period 2005 to 2020. The bank specific data were mainly collected from annual audited financial reports of the respective sample banks and the macroeconomic data were collected from NBE.

Data was presented and analyzed by using descriptive statistics, correlation analysis and pooled OLS regression analysis to identify the determinants of liquidity of Ethiopian private commercial banks which were measured by total loan to total deposit. The result of this study confirmed that, among the bank specific variables; capital adequacy, bank size, loan, deposit had statistically significant impact on the liquidity of Ethiopian private commercial banks.Whereas, return on asset, gross domestic product and interest rate margin had no statistically significant impact on the determination of liquidity of Ethiopian private commercial banks.

The coefficient sign for loan revealed negative relationship with liquidity and it was similar with the researcher expectation and similar with finance theory. The positive relationship between bank size and liquidity was in line with our hypothesis but inconsistent with the "too big to fail" hypothesis.It was found that profitability and liquidity had positively related and the former has insignificant impact on the later and it was inconsistent with our hypothesis but it was consistent with (Bourke, 1989)result.

5.3Recommendations

The findings of the research have fortified the researcher to suggest the following policy recommendations:

Improving on bank specific factor to maintain bank liquidity

➢ Capital adequacy:While formulating new directives or modifying the existing policies, NBE shall take into account that the increase of capital and statutory reserve requirements policy has stood pressure on the private banks liquidity

➢ Bank size: Big banks needs to manage their liquidity position and shall give due attention on resource mobilization and liquidity management.

➢ Profitability (ROA): Private commercial shall have liquidity management policy to ensure that they are operating to satisfy their profitability target as well as the ability of meeting the financial demands of their customers by maintaining optimum level of liquidity.

➢ Deposit growth: This finding implies that with an increase in deposits, banks should also increase their liquidity holding so that, a bank run can be avoided in case of high deposit withdrawal. Generally, commercial banks have to consider external factors affecting liquidity in addition to their internal factors in addressing their liquidity strategy

➢ Just like as bank specific factor, external (macroeconomic factor) have influence on liquidity of Ethiopian private banks so all private commercial banks in Ethiopia cannot ignore the macroeconomic indicators while targeting to improve their liquidity position. Thus, banks in Ethiopia should not only be concerned about internal structures, policies and procedures, but they must consider both the internal environment and the macroeconomic environment together in developing their strategies to competently manage their liquidity position.

➢ The prime focus of this research was on identifying the determinants of private banks liquidity in the case of selected private commercial banks in Ethiopia using selected variables. However, there might be variables that were not included in this study. Thus, future researchers are recommended to undertake similar study by considering additional variables on the same banks which will be useful to validate findings of the current study. Furthermore, it is suggested that researchers consider the newly emerging banks in doing the same research

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APPENDIXES

Appendixes 1. **Ethiopian privates commercial bank establishment year.**

No	Banks	Year of establishment
1	Awash Bank	1994
2	Dashen Bank	1995
3	Wegagen Bank	1997
4	Abyssinia Bank	1996
5	United Bank	1998
6	Nib International Bank	1999
7	Cooperative Bank of oromia	2004
8	Lion International Bank	2006
9	Zemen Bank	2008
10	OromiaInternatinal Bank	2008
11	Bunna International Bank	2009
12	Berhan International Bank	2009
13	Abbay Bank	2010
14	Addis International Bank	2011
15	Debub Global Bank	2012
16	Enat Bank	2012
17	Zamzam Bank	2018

Correlation Analysis Table ByStata Version 16 Computations

```
. corr li cap size lo dep roa gdp irm
(obs=112)
```

	li	cap	size	lo	dep	roa	gdp	irm
li	1.0000							
cap	-0.0329	1.0000						
size	-0.3064	-0.0936	1.0000					
lo	0.8643	-0.3993	-0.0707	1.0000				
dep	-0.0175	-0.9158	0.1391	0.4075	1.0000			
roa	-0.1195	-0.4605	0.0244	0.0048	0.2787	1.0000		
gdp	0.0090	0.0699	-0.6373	-0.1267	-0.1161	0.1231	1.0000	
irm	-0.1996	0.0557	0.5242	-0.1258	-0.0608	-0.0452	-0.4065	1.0000

Appendix 2 test for classical regression model assumption

1. Normality test by stata version 16

. sktest resid

Skewness/Kurtosis tests for Normality

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	Prob>chi2
resid	112	0.0350	0.8217	4.57	0.1015

2. Test for multicollinearity

vif

Variable	VIF	1/VIF
cap	9.00	0.111108
dep	7.67	0.130372
size	2.13	0.468993
gdp	1.87	0.535336
roa	1.62	0.617458
irm	1.45	0.688640
lo	1.34	0.747921
Mean VIF	3.58	

3– **Heteroskedasticitytest result by stata version 16 computations**

```
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
        Ho: Constant variance
        Variables: fitted values of li

        chi2(1)       =      65.73
        Prob > chi2   =     0.0000

. regress li cap size lo dep roa gdp irm ,robust

Linear regression                               Number of obs   =        112
                                                F(7, 104)       =     356.29
                                                Prob > F        =     0.0000
                                                R-squared       =     0.9450
                                                Root MSE        =     .03384
```

li	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf. Interval]	
cap	-.2581979	.1734217	-1.49	0.140	-.6020996	.0857038
size	-.0234954	.0080354	-2.92	0.004	-.0394298	-.007561
lo	1.4227	.0496515	28.65	0.000	1.32424	1.521161
dep	-.8878194	.0758281	-11.71	0.000	-1.038189	-.7374495
roa	-.5922669	.7594236	-0.78	0.437	-2.098232	.9136985
gdp	-.3115973	.1948486	-1.60	0.113	-.6979893	.0747948
irm	-.1428272	.3195621	-0.45	0.656	-.7765308	.4908765
_cons	1.272744	.2023415	6.29	0.000	.871493	1.673995