ST. MARY'S UNIVERSITY SCHOOL OF GRADUATE STUDIES

DETERMINANTS OF BANK LIQUIDITY: EMPIRICAL STUDY ON SELECTED PRIVATE ETHIOPIAN COMMERCIAL BANKS

ATHESIS PRESENTED IN PARTIAL FULLFILMENT OF THE REQUIREMENTS OF THE DEGREE OF MASTERS OF SCIENCE IN ACCOUNTING AND FINANCE

By

MERON GIRMA

ID: 0319/2009A

ADVISOR: DR ZENEGNAW ABIY HAILU

JUNE, 2018

ADDIS ABEBA, ETHIOPIA

St. Mary's University School of Graduate Studies

This is to certify that the thesis prepared by Meron Girma, entitled: Determinants of bank Liquidity: Empirical study on Selected private Ethiopian Commercial Banks is submitted in partial fulfillment of the requirements for the degree of Master of Science in Accounting and Finance complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

Approved by:

Dean, Graduate Studies Signature

……..……

Internal examiner: Signature

Dr. Aberham G/giyorgis

……..……..

External examiner: Signature

Dr. Arega Seyum

…..…….

Declaration

I the undersigned, declare that this thesis entitled: Determinants of bank Liquidity: Empirical study on Selected private Ethiopian Commercial Banks is my original work prepared under the guidance of my Advisor Dr Zenegnaw Abiy Hailu, all sources of materials used for the thesis have been duly acknowledged, i further confirm that the thesis has not been submitted either in part or in full to any other higher learning institution for the purpose of earning any degree.

Name	Signature
St. Mary's University College, Addis Ababa	**June, 2018**

Abstract

Optimal liquidity maintenance is important objective of banks solvency, hence this study identifies the determinants of liquidity on selected Ethiopian commercial banks, in order to achieve the research objective the study applies fixed effect panel regression for six commercial banks as a sample covering the period from 2000 to 2017 by applying non-probability sampling method type which is purposive sampling. The study also used explanatory research design and quantitative research approach by gathering important data's from secondary source referencing to documents available within the financial statements of the banks. The findings of the study implies that among the five factors affecting banks liquidity Market share,investement in domestic banks has positive and statistically significant impact on banks liquidity where as Non performing loan has negative but significant impact on banks liquidity. GDP growth rate and unemployment rate had statistically insignificant impact on banks liquidity.

Keywords: Bank's liquidity, Liquidity Ratio, Panel Fixed Effect Regression Model, commercial banks.

ACKNOWLEDGEMENTS

First of all am thankful to almighty God who has been giving me strength, faith and dedication in accomplishing this work then, I forward my deepest appreciation to my Advisor Dr Zenegnaw Abiy Hailu who has been forwarding advice and feedbacks and also appreciated the time and effort from him, then I give my sincere thanks to Michael W/gebreal who has been believing in me in my hardest times and appreciates and motivates me all courses of this work and finally, i give my special thanks to W/ro Haimanot Ayalneh who has been giving me moral and support through out the courses of this work.

List of figures

List of tables

List of Acronyms and Abbreviations

AIB: Awash International Bank

BoA: Bank of Abyssinia

DB:Dashen Bank

WB:Wegagen Bank

NIB:Nib international Bank

UN: United Bank

NBE: National bank of Ethiopia

BIS: Bank for International Settlement

CLRM: Classical Linear Regression Model

FEM: Fixed Effect Model

CSA: Central statistics agency

MOFEC: Ministry of finance and economic corporation

LQ: Liquidity

GDP: Gross Domestic Product

UN: Unemployment rate

INDB: Investment in domestic banks

MS:Market share

NPL:Non performing loan

JB: Jarque-Bera

DW:Durbin-Watson

List of Appendices

CHAPTER ONE

INTRODUCTION

1.1 Back Ground of the Study

The term liquidity is often used in multiple contexts, an asset's liquidity can be used to describe how quickly, easily and costly it is to convert that asset in to cash (Berger &Bouwman, 2008). Liquidity can also be used to describe a company by the amount of cash or near cash assets a company has ,the more liquid assets the higher a company's liquidity one such ratio is the current ratio which determines a company's ability to pay short term debts as they come due (Van Ness, 2009).

Liquidity is a bank's capacity to fund increase in assets and meet both expected and unexpected cash and collateral obligations at reasonable cost and without incurring unacceptable losses effective liquidity risk management helps ensure a bank's ability to meet its obligations as they fall due and reduces the probability of an adverse situation developing (Manish &Ghanshyam, 2013).

Banks play a major role in the development of the country especially in Ethiopia, financial sector of Ethiopia has been registering nearly 15% annual growth for the past ten years thus the banking industry is the largest of all financial sectors in Ethiopia both in resource and national contribution it constitutes more than 86% of the finance sector and 90% of the total asset (MoFED, 2014).

Banks are the main part of the financial sector in any economy, performing valuable activities on both sides of the balance sheet. On the asset side, they enhance the flow of funds by lending to the cash starved users of funds, whereas they provide liquidity to savers on the liability side ,Banks also facilitate the payments and settlement systems and support the smooth transfer of goods and services. They ensure productive investment of capital to stimulate the economic growth and also help to develop new industries, thereby increasing the employment and facilitating the growth, (Diamond and Rajan, 2001).

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 have short-term maturities, Banks contribute a central role in all modern financial systems to perform effectively banks must be safe and be perceived as such. The single most important assurance is for the economic value of a bank's assets to be worth significantly more than the liabilities that it owes. However, the recent financial crisis underlined the importance of a second type of buffer the liquidity that banks have to cover unexpected cash outflows, a bank can be solvent, holding assets exceeding its liabilities on an economic and accounting basis, and still die a sudden death if its depositors and other funders lose confidence in the institution (Douglas J,2014).

Liquidity problem can lead a company to face serious financial problems in addition to this liquidity risk can also be defined in terms of the counterparty to a transaction, in this sense the term means the risk inherent in the fact that the counterparty may not have the ability to pay or settle the transaction even if they are in good financial standing, because of a lack of liquidity (Petria, 2009).

The objective of liquidity management is vital to ensure that banks are able to meet in full all their financial obligations as they fall due so, liquidity is a significant determinant of financial distress because without liquidity a bank cannot meet the deposit withdrawals and satisfy customer loans.

In December 2006, the Basel Committee on Banking Supervision established the working group on liquidity to review liquidity supervision practices in member countries the working group's mandate was to take stock of liquidity supervision across member countries by using different approaches and tools used by supervisors to evaluate liquidity risk and banks' management.

This study identifies the different variables that creates impact on commercial banks liquidity aiming at identifying the factors that have the significant impact on the banking sector liquidity with main goal of assessing how the variation of this factors affect the banking sectors liquidity by applying different statistical methods such as and multiple regression analysis and correlation analysis.

1.2 Statement of the Problem

Liquidity at a bank is a measure of its ability to readily find the cash it may need to meet demands upon it why we care about liquidity is that since banks major profit emerges from demand deposits and other short-term funds by lending them back out at longer maturities if depositors lose confidence in a bank or in the banking system they will withdraw their funds this will make banks to be inherently fragile and lose confidence of their depositors margins (Douglas, 2014).

In the first quarter of 2017/18 NBE Report, broad money supply amounted to Birr 602.3 billion, registering 29.9 percent growth over the corresponding quarter of last fiscal year, the increase in broad money was ascribed to 630.1 percent and 115.8 percent expansions in domestic credit and non-financial activities respectively. The growth in domestic credit was driven by 93.1percent up surge in credit to central government and 23.2 percent credit to non-central government. Government's measure to raise commercial banks' capital by issuing non-interest bearing bond attributed to the expansion of credit to the central government, at the end of first quarter of 2017/18 reserve money reached Birr 152 billion depicting 24.5 percent growth over last year same quarter. Component wise, both currencies in circulation and bank deposits at NBE rose by 10.7 and 57.3 percent respectively.

Various studies has been conducted on determinants of Ethiopian banks liquidity among them are the studies by (Tseganesh, 2012),(Natenael ,2013)&(Berhanu, 2015), and also

studies by (Mekbib, 2016), (Alemayhu, 2016)& (Nigist, 2015) try to show the impact of different factors on liquidity of Ethiopian commercial banks, thus the reason behind conducting this study even if many related studies were done is that the studies made previously uses the same variables in explaining liquidity and due to the importance of the issue and since banks are the major financial sectors and source of investment in the country maintaining their liquidity is essential ,hence to the knowledge of the researcher the empirical studies on the area didn't include variables such as unemployment and investment in domestic banks, therefore empirical studies on additional factors that determines banks liquidity are essential to explore unknown outcomes and providing some evidence. Thus this study aimed to provide some evidence on additional factors and shows their impact to the liquidity of commercial banks.

1.3 Research Questions

The following specific research question was formulated:-

- How the Macro economic variables that are GDP and unemployment affect Ethiopian commercial banks liquidity and what impact do they have on liquidity?
- How does the bank specific factors such as investment in domestic banks, market share and non -performing loans affects liquidity of Ethiopian commercial banks?

1.4 Objectives of the Research

1.4.1 General objective

The general objective of this study is to determine the factors affecting liquidity of selected commercial banks and ensuring the ability to meet up depositor's demand and maximize their shareholder value.

1.4.2 Specific Objectives

In relation with the research questions the following specific research objectives were proposed:-

- To identify the relationship between GDP and liquidity of commercial banks.
- To see the impact of unemployment on liquidity of commercial banks.
- To identify the implication of investment in domestic banks on liquidity position of commercial banks?
- To show the relationship between market share and banks liquidity?
- To show the impact of nonperforming loans on liquidity of commercial banks?

1.5 Research Hypothesis

The research question formulated was forwarded by the following hypotheses:

Gross Domestic Product (GDP)

H1: GDP growth has negative and significant effect on banks liquidity

- An increase in GDP make banks run down their liquidity buffer and initiates banks to lend more.

Unemployment

H2: Unemployment has negative and significant effect on banks liquidity

- An increase in the unemployment rate reduced capital and hampered liquidity creation.

Market Share

H3: Market share has positive and significant effect on banks liquidity

- The amount of liquidity that banks offer depends on the degree of direct participation in the market.

Investment in domestic banks

H4: Interbank Interest rate has negative and significant effect on banks liquidity

- Banks reducing liquidity risk by enhancing investment, thus deposits in interbank makes banks to enjoy stable growth.

Nonperforming Loan

H5: Non performing loan has Negative and significant effect on banks liquidity

- An increase in NPL results in reducing banks liquidity and profitability

1.5 Significance of the study

The study will provide objectively analyzed information for interested users such as bank's shareholders, Vp Operations, Treasury & Fund Control Dep't, business operation risk management department operational risk management specialists which enable them to make an informed decision on which liquidity system to adopt and NBE policy makers considered it as a practical use for economic policy in monitoring and measuring precisely the most influential factors on banking sector liquidity by clearly identifying macro-economic factors with that of bank related factors affecting liquidity &the strength and weaknesses of the system by showing ways to minimize the effect of liquidity problems in order to accomplish the quality of Banks' risk assets banks effective mitigation of liquidity and develop initiatives by providing relevant information, also it academically contributes to the existing knowledge in the area by showing important and significant factors determining liquidity.

The study also will contribute in giving a greater attention and concern of liquidity to the banks concerned bodies in retaining banks ratios to the required limit in insuring that low cost sources of liquidity are part of the banks functioning and to follow reliable source of liquidity in order to minimize their fear to liquidity mismatch.

1.6 Scope of the study

The scope of the study was mainly focused on six commercial banks that are giving services in Ethiopia, recently there are eighteen commercial banks operating in Ethiopia the reason why the banking sector was chosen is due to the availability and the reliability of the financial statements and the sector is the major source of investment operations in the country and based on their year of establishment the six sample banks were selected because they have accessible sources and available data hence the frame for the data covered is from 2001-2017, so as to increase the sample data and in order to explain the independent variables precisely.

1.8 Limitations of the study

The study will encountered limitations such as measurement error while conducting the regression model, in addition to this to measure liquidity three proxies are available but the researcher have taken one proxy to measure liquidity as a result this may be considered as a limitation for this particular study.

1.9 Organizations of the paper

The remaining part of the study has been conducted as follows, chapter two of the study will be reviewing the different literatures on the area of liquidity followed by chapter three of the study will analyze the research design of study and then chapter four of the study will be interpreting the findings of the study and finally chapter five of the study will be conclusions and recommendations of findings of the research.

Chapter Two

Review of Related literature

Introduction

In this chapter the study review related literatures by focusing on reviewing of past studies done on liquidity by presenting a review of the theories guiding the study, and showing the importance of liquidity to the financial performance and stability of commercial banks(Yayi,2016) ,Liquidity has long been known as the lifeline for commercial banks, it not only lays the foundation for all activities of commercial banks but also plays a decisive role in maintaining the economic stability of the whole country and even the world.

2.1 Theories of bank liquidity

According to (Greuning&Bratanovic ,2009), a bank faces liquidity risk when it does not have the ability to efficiently accommodate the redemption of deposits and other liabilities and to cover funding increases in the loan and investment portfolio. These authors go further to propose that a bank has adequate liquidity potential when it can obtain needed funds by increasing liabilities, securitizing, or selling assets promptly and at a reasonable cost.

For Banks to play a central role in all modern financial system and to perform its role effectively it should manage its liquidity properly, as (Golin,2001)&(Yuqi ,2008) states liquidity is a risk not having sufficient current assets (cash and quickly saleable securities)

to satisfy current obligations of depositors especially during the time of economic stress, therefore without required liquidity and funding to meet obligations bank may fail.

Liquidity is current assets which should be managed efficiently to safeguard the firm against the risk of illiquid. Lack of liquidity in extreme situations can lead to the firm's insolvency hence; insufficient liquidity is one of the major reasons of bank failure. Liquidity is necessary to enable banks providing funds on demand and credits needed by customers. (Pandey, 2010).

A lot of scientific researchers are devoted to developing the methodological basis of financial risk estimation and information support (Lobanov&Chugunov, 2003).Nevertheless the latest technology which combines the achievements of artificial intelligence, numerical mathematics, statistics, has enabled to suggest new promising approaches to risk assessment and information support, this will facilitate the implementation of an integrated approach to finance and risk management.

Since a few years ago there was a financial crisis, the Basel Committee on Banking Supervision is developing new international regulations designed to minimize the possibility of the next large-scale financial crisis. The latest Committee "frame" (Basel III) includes strict capital rules which will force all banks to increase more than three times the capital amount in order to avoid the future rescue by taxpayers. It does not require significant capital growth, according to the Basel Committee studies, 100 largest banks worldwide need only about € 370 billion of additional reserves to meet the new rules in

2019 (Moshinsky, 2012). The main purpose of the Basel III is to improve the quality of risk management in the banking business, which in turn should enhance financial system stability as a whole.

Liquidity risk occurs when the depositors collectively decide to withdraw more funds than the bank immediately has on hand, or when the borrowers fail to meet their financial obligation to the banks. In the other words, liquidity risk occurs in two cases. Firstly, it arises symmetrically to the borrowers in their relationship with the banks, for example when the banks decide to terminate the loans but the borrowers cannot afford it. Secondly, it arises in the context of the banks' relationships with their depositors, for example, when the depositors decide to redeem their deposits but the banks cannot afford it, the banks regularly find imbalances gaps between the asset and the liability side that need to be equalized because by nature banks accept liquid liabilities (Manish&Ghanshyam, 2013).

In the studies of (Calomiris&Kahn ,1991), depositors receive noisy and independent signals about the risky portfolio outcome of the bank. By holding reserves, banks insulate themselves against the liquidity risk of a small number of misinformed early withdrawals in states of the world where the outcome is actually good. Without those reserves, banks offering demandable debt contracts which are optimal in the Calomiris-Kahn model would unnecessarily subject themselves to physical liquidation costs when they fail to meet depositor's requests for early withdrawal.

2.2Theories on Concept of liquidity

2.2.1 The Real Bills Doctrine

The real bill doctrine was originated in the 17thcenturiesit states that a commercial bank should advance only short term self-liquidating productive loans to business firms, this are those loans which are meant to finance the production, and movement of goods through the successive stages of production ,storage, transportation ,and distribution ,when such goods are ultimately sold the loans are considered to liquidating productive loans, the central bank in turn should only land to the banks on the security of such loans, the principle ensure the proper degree of liquidity for each bank and the proper money supply for the whole economy, and since the loans matures in short run and are for productive purposes there is no risk of their running to be bad debts(Green ,1989).

2.2.2 The Seeds of a Crisis

In their model (Viral& Hassan, 2010) develop a theory of seeds of a crisis when banks are flush with liquidity ,in their model they try to show that excessive liquidity induces risk taking behavior of managers, They also show that the optimal monetary policy involves a "leaning against liquidity" approach, i.e. a central bank should adopt a contractionary monetary policy at times when banks are awash with liquidity so as to draw out their reserves and it should adopt an expansionary monetary policy at times when banks have scarce liquidity so as to boost investment.

2.2.3 The Liability Management Theory of liquidity

This theory was developed in the 1960s, the theory reveals that there is no need for banks to grant self-liquidating loans and keep liquid assets because they can borrow reserve

money in the money market, a bank can acquire reserves by creating additional liabilities against itself from different sources the sources include issuing of time certificates of deposit, borrowing from the central banks, raising of capital funds by issuing shares and by plugging back of profits, according to this theory banks can satisfy liquidity needs by borrowing in the money and capital markets by considering both sides of banks' balance sheet as a source of liquidity (Emmanuel,1997).

2.2.4 Keynes Liquidity Preference Theory

As Keynes -Liquidity Preference theory Keynes, (1936) 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. 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 benchmarked 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.

2.2.5 Anticipated Income Theory of Liquidity

This theory of liquidity was developed by (H.Prochanow,1944),on the basis of practices of extending term loans by the US commercial banks ,this theory suggests that regardless of the nature and character of a borrowers business the bank plans the liquidation of the term loans from the anticipated income of the borrower ,the theory has advantage in a way that it fulfills the three objectives of liquidity, safety and profitability, it satisfies the safety principle because the bank grants a loan not only on the basis of a good a good security but also on the ability of the borrower to repay the loan, but the theory fails to meet emergency cash needs.

2.2.6 The Shiftability Theory of Liquidity

The shift-ability theory of bank liquidity was developed by (H.Moulton ,1915), who asserts that if commercial banks maintain a substantial amount of assets that can be shifted on to other banks for cash without material loss in case of necessity, then there is no need to reply on maturities, according to this view, an asset to be perfectly shift able must be immediately transferable without capital loss when the need for liquidity arises.

The theory goes beyond theory, banks now days accept sound assets which can be shifted on to other banks, shares and debentures of large companies are accepted as liquid assets along with treasury bills and bills of exchange, but the theory has weakness in a way that it ignores the fact that in times of acute depression, the shares and debentures cannot be shifted on to others by the banks, in such case there are no buyers and all who possess them want to sell them.

2.3 Theories on functions of liquidity

The importance of liquidity for sound banking practice is well established at both the theoretical and operational levels, Bank liquidity indicates the degree to which a financial institution is able to meet its obligations under normal business conditions, Liquidity risk management is an essential component of the overall risk management framework of the financial services industry, concerning all financial institutions (Majid, 2003). The balance sheets of banks are growing in complexity and dependence upon the capital markets has made the liquidity risk management more challenging (Guglielmo, 2008),he further argues that the banks having enhanced exposure in the capital markets must have a deep understanding of the risks involved.

According to (Gatev&Strahan, 2003), the deposits provide a natural hedge to banks against the liquidity risk. Under the stressed market conditions, the banks are perceived as a haven for investors who do not intend to issue funds against their loan commitments. The cash flows in any bank complement each other. The inflows of funds give a natural hedge to banks for outflows due to loan advancements. Therefore, banks use deposits to hedge the liquidity risk.

This argument also finds support from the work of (Kashyap et al, 2002) who provided a rationale of risk management to define the features of a commercial bank, commonly labeled as "financial intermediary" combining demand deposits with loan commitments, one possible counter measure to reduce liquidity pressure is the transformation of liquid assets into cash in times of immense funding pressure.

2.4Theories on Determinants of liquidity

GDP and Liquidity

Banks prioritize liquidity when the economy plummets, during risk lending opportunities, while neglecting liquidity during economic boom when lending opportunities may be favorable, thus banks forgo liquidity inducing lending during economic growth,(Aspachs, Nierand&Tiesset ,2005).

The macroeconomic policy stability, Gross Domestic Product, Inflation, Interest Rate and Political instability are also other macroeconomic variables that affect the performances of banks. For instance, the trend of GDP affects the demand for banks asset. During the declining GDP growth, the demand for credit falls which in turn negatively affects the profitability of banks. On the contrary, in growing economy as expressed by positive GDP growth, the demand for credit is high due to the nature of business cycle. During boom the demand for credit is high compared to recession, (Athanasoglou et al,2005)

In the theory of bank liquidity and financial fragility, the relationship between banks" liquidity preference and the business cycle is fundamental to explain the inherent instability of the capitalist system as an endogenous market process (Minsky, 1982). In periods of economic expansion, which are characterized by high degree of confidence of the economic units about their profitability, there is a rise in the level of investment. During this expansion, economic units decrease their liquidity preference, preferring more risky capital assets with higher return. In this environment, economic units are more likely to hold less liquid capital assets and to incur short-term debt with higher interest rates (Painceira, 2010) the demand for differentiated financial products is higher during

economic boom and may improve bank ability to expand its loan and securities portfolios at a higher rate.

Investment in domestic banks and liquidity

Banks can enhance domestic investment in various ways. First, banks increase the amount of funds available for investment by pooling savings. Financial intermediaries are able to economize on the costs of collecting savings from heterogeneous saving units by exploiting economies of scale in information gathering and processing, as a result for given levels of per capita income and potential saving rate, the actual saving and investment rates should be higher in countries that have more developed banking systems (Pagano, 1993).

Banks reducing liquidity risk by enhancing investment (Diamond and Dybvig 1983; Bencivenga and Smith 1991), investment often requires the commitment of large amounts of capital for a long time. However, individual savers are reluctant to lend over the long term because they need to maintain a comfortable degree of liquidity in their asset portfolios. Banks can facilitate this trade-off between returns to assets and liquidity by pooling savings, borrowing short term and lending long term. In a country with a poorly developed banking system, profitable investment projects will not be undertaken because of the lack of capital.

Unemployment and liquidity

In his study (Chetty, 2008) uses a two pronged approach to estimate the size of liquidity effect of benefit level increases relative to the total effect of unemployment insurance benefits. First, he uses data from the Survey on Income and Program Participation to

estimate both the total effect of increases in unemployment insurance benefit levels on the likelihood exit from unemployment and the effects of increases in unemployment insurance benefit levels on individuals stratified by net financial wealth quartile, next he uses data from Mathematics on severance payments to estimate the liquidity effect of increases in unemployment insurance benefit levels on the likelihood of exit from non-employment he finds that when benefits are 50 percent of the wage, 60 percent of the effect on likelihood of exit to employment is driven by the liquidity effect.

Market share and liquidity

(Boone ,2008)reveals that competition means that the banks' products are close substitutes and entry costs are low over the concentration measures and some other Competition proxies, if bank product substitution increases efficient banks gain market share and as the efficiency structure hypothesis proposes, there is more competition in the market, if these efficient banks those which already have a dominant position in relation to the others,TheHerfindahl Hirschman Index would increase instead of decreasing, also measures that imply that competition is inversely proportional to the magnitude of the price margin over marginal costs would not capture this effects well, efficient banks may charge higher prices because of their efficient lead which can make them reduce marginal costs quicker than prices.

Non performing loan and liquidity

Toby (2008), in his study quoted that the use of minimum liquidity ratio (MLR) as monetary policy tool has an inverse association with industry asset quality measured with

NPLs, also though issues relating to non-performing loans may affect all sectors, the most serious impact is on financial institutions such as commercial banks and mortgage financing institutions which tend to have large loan portfolios. Besides, the large bad loans portfolios will affect the ability of banks to provide credit. Huge non-performing loans could result in loss of confidence on the part of depositors and foreign investors who may start a run on banks, leading to liquidity problems,(Bloem and Gorter ,2001).

As (Clifford & Michael ,2012) states Non-performing loans as "bad loans", impaired loans or problem loans which are ninety days or more past due or no longer accruing interest and are not generating income, it is clear that NPLs are loans that a bank customer fails to meet his contractual obligations on either principal or interest payments exceeding 90days. NPLs are loans that give negative impact to banks in developing the economy.

2.5 Empirical Review of Related Literature's in the world

The study by (Racic, 2014) identifies the factors influencing the liquidity of banks results support the idea that the movement of the underlying macroeconomic factors contributed to the high liquidity of the banking sector in Serbia. The increase in the unemployment rate, inflation rate, determines the exposure of the banking sector to liquidity risk at a statistically significant level.

Bank-specific and macroeconomic determinants of liquidity of English banks were studied by (Aspachs et al,2005). The researchers used unconsolidated balance sheet and profit and loss data, for a panel of 57 UK-resident banks, on a quarterly basis, over the period 1985 to 2003.They assumed that the liquidity ratio as a measure of the liquidity should be dependent on following factors: Probability of obtaining the support from LOLR(Lender of last resort), which should lower the incentive for holding liquid assets, interest margin as a measure of opportunity costs of holding liquid assets expected to have negative impact, bank profitability, which is according to finance theory negatively correlated with liquidity, loan growth, where higher loan growth signals increase in illiquid assets, size of the bank expected to have positive or negative impact, gross domestic product growth as an indicator of business cycle negatively correlated with bank liquidity, and short term interest rate, which should capture the monetary policy effect with expected negative impact on liquidity.

(Konadu, 2009) did a study on liquidity and profitability, empirical evidence from listed banks in Ghana. The objective of the study is to determine the liquidity trend of selected banks, to ascertain the profitability trend of the selected banks and to establish and analyze the relationship between the banks liquidity and profitability levels from 2002 to 2006. The researcher considered only banks listed on the Ghanaian stock exchange. The banks randomly selected were Standard Chartered Bank Ghana Ltd, Cal Bank Ltd and SG-SSB Ltd.

(Moore, 2010) investigated the effects of the financial crisis on the liquidity of commercial banks in Latin America and Caribbean countries. The study had three main goals,

discussing the behavior of commercial bank liquidity during crises in Latin America and the Caribbean, identifying the key determinants of liquidity and to provide an assessment of whether commercial bank liquidity during crises is higher or lower than what is consistent with economic fundamentals the macroeconomic situation, where a cyclical downturn should lower banks' expected transactions demand for money and therefore lead to decreased liquidity expected to have positive impact on liquidity, and money market/short term interest rate as a measure of opportunity costs of holding liquidity expected to have negative effect on liquidity, The results of the study showed that the volatility of cash to deposit ratio and money market interest rate have negative and significant effect on liquidity. Whereas, liquidity tends to be inversely related to the business cycle in half of the countries studied, suggesting that commercial banks tend to error on the side of caution by holding relatively more excess reserves during downturns. Generally, the results showed that on average, bank liquidity is about 8% less than what inconsistent with economic fundamentals, While studying determinants of liquidity of Polish commercial banks.

(Vodova,2010) found that bank liquidity is strongly determined by overall economic conditions and dropped as a result of financial crisis, economic downturn, higher interest rate margin and increase in unemployment. On contrary, bank liquidity increases with higher inflation and interest rates on loans and interbank transaction. Liquidity created by Germany's state owned savings banks and its determinants has been analyzed by (Rauch et al,2009). The study had two important goals; first, it attempted to measure the liquidity creation of all457 state owned savings banks in Germany over the period 1997 to 2006. In a second step, it analyzed the influence of monetary policy on bank liquidity creation.

The study measures the created liquidity using the calculation method set forth by (Berger and Bouwman, 2007) and (Deep and Schaefer ,2004). To measure the monetary policy influence, the study developed a dynamic panel regression model. According to this study, following factors can 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, level of liquidity in previous period has positive impact, size of the bank measured by total number of bank customers have negative impact, and bank profitability expected to reduce banks liquidity.

In their study (Ferrouhi and Lehadiri ,2013) the panel data reveals that Liquidity is mainly determined by foreign direct investment, monetary aggregate M3, foreign assets, growth rate of gross domestic product, public deficit, inflation ratio and the effects of financial crisis. Liquidity is positively correlated with monetary aggregate M3, foreign assets, and foreign direct investment and negatively correlated with inflation rate, growth rate of GDP, public deficit and financial crisis. However, unemployment rate have no impact on bank's liquidity.

In the model, profitability is regressed as a non-linear expression of relative liquid asset holdings as well as a set of control variables. The relationship is a function of the liquid assets ratio, a measure of short-term funding reliance and general macroeconomic conditions While controlling for other factors, the paper found evidence, based on a panel

of Canadian and American banks from 1997 to the end of 2009, that profitability is improved for banks that hold some liquid assets, however, there is a point at which holding further liquid assets diminishes a banks‟ profitability, all else equal.

A study by (Kieschnick, et al,2008) using data on a panel of U.S. corporations from 1990through 2004, established the importance of working capital management to firm value. Their study used stock's excess return to represent the firm value and findings show that on average an additional dollar invested in net operating working capital reduces firm value and this indicates that their study is consistent with industry surveys suggesting that some firms over-invest in net operating working capital.

(Al-Tamimi ,2008) studied the relationship between the readiness to implement the Basel II Accord and the resources needed to implement it in UAE banks. The results revealed that these banks are aware of the benefits, impact and challenges associated with the implementation of the Basel II Accord. However, the research did not find any positive relationship between the UAE banks' readiness to implement Basel II and the impact of that implementation. Nor was the relationship between readiness and anticipated cost of implementation confirmed.

The behavior towards liquidity is affected by a firm's characteristics a bank's liquidity position is affected by its size, status and product type. The size affects the attitude of the bank towards wholesale funding including the access opportunity (Allen et al, 1989) and the price of the funds obtained (Nyborg et al, 2002). Bank size matters because of the

economy of scope and scale concerning liquidity, a large bank might have better access to the interbank markets because it has a larger network of regular counterparties or a wider range of collateral (Fechtetal,2008). The product type offered to the counterparties, on both the assets and liabilities sides, is able to affect the liquidity position; banks that take on demand deposits and offer loan commitments need to hold higher liquidity buffers that can be mitigated if an imperfect correlation holds (Kashyap et al,2002).

The empirical literature on the repo market generally agrees that repurchase agreements against riskier/less liquid types of collateral were a source of liquidity stress on the dealer banks during crisis. The empirical literature also suggests that secured funding transactions against more safe/liquid assets in the case of the United States treasuries, agency debentures and agency mortgage backed securities generally remained in place even for institutions under stress. Based on limited data it appears that the withdrawal of prime brokerage fund balances was also a substantial Source of outflows during the crisis.

(Duffie,2012) provides some helpful empirical context on the relative importance of repo haircut widening on liquidity losses to US banks following Lehman's failure. He shows that repo haircut widening resulted in a $4 billion loss to Morgan Stanley's liquidity pool over two-week timeframe around Lehman's failure relative to a $56.4 billion loss relating to prime brokerage Outflows and $85.3 billion liquidity loss at Morgan Stanley overall. Unfortunately, a lack of research in these areas hampers our ability to draw meaningful conclusions about how best to address these business activities in designing and evaluating liquidity stress tests FSB, (2012).

(Guglielmo,2008) further argues that the banks having enhanced exposure in the capital markets must have a deep understanding of the risks involved. The said banks should develop the mechanism required for proper risk measurement and management. A bank should have continuous awareness about the breakdown of its various funding sources in terms of individual strata of clientele' financial markets and instruments (Falconer, 2001).

(Al-Kour,2008**)** study's aims at estimating the inefficiencies in ancient industrial banks and Islamic Jordanian (fifteen banks) and through the amount from 1993 to 2006 with the translog operate and methodology of reducing constant fortuitous (SFA). The findings of the study showed the existence of great deviations than best, and reduced levels value efficiencies and profit potency and different customary. The findings conjointly show the enjoyment of Moslem banks with high level of efficiency gains, however is way from being best with relevance the price economical, which can lead to economical legislation and developing laws that force them to maintaining high levels of liquidity in owing to lack of the money instruments, the twins within the short term between liquidity and profitableness of line with law.

(Douglas&Raghuram,1999) both investors and borrowers are involved concerning the liquidity. Investors wish money as a result of them unsure concerning after they wish to eliminate their conduct a money quality. Borrowers a involved concerning the liquidity, as a result of the unsure on their ability to continue attract or retain the funding. As a result of the borrowers typically can't repay the investors for the asking, investors' need a premiums or a big rights of management after you are given on to borrowers, as a compensation for

the investors be the topic of illiquidity. We tend to argue that the banks will solve these liquidity problems that arise during a loan. Banks enable the depositors to withdraw on low price, furthermore as businesses swab from liquidity wants their investors. Show USA the bank should have a capital structure of fragile, subject to bank runs, so as to play those functions. This model may be used for investigate problems like slender banking and capital necessities of banks.

(Takang and Ntui,2008) studied bank performance and credit Risk Management and their study result shows there is a significant relationship between bank performance (in terms of profitability) and credit risk management (in terms of loan performance). Better Credit Risk Management results in better bank performance.

(Vodova ,2011) examined the determinants of commercial bank's liquidity in Slovakia, aimingto identify the liquidity of commercial banks, macroeconomic data over the period from 2001 to 2010 were considered and analyzed with panel data regression method. The finding of the study showed that bank liquidity drops basically as a result of the financial crisis. In addition liquidity measured by lending activities of banks increases with the growth of GDP and decreases with higher unemployment. But interest rates, interest margin, rate of inflation have no statistically significant effect on the liquidity of Slovak commercial banks.

2.6 Related Empirical studies in Ethiopia

If we see the different studies conducted in Ethiopia the different directives applied in the banking environment in Ethiopia have created many structural and organizational changes

in the banking sector of the country and also encouraged private banks to enter and expand their operations in the industry (Lelissa, 2007).

The commercial banks face different problems to manage liquidity risk, these are absence of secondary markets and well developed payment system and management Information system (MIS), shortage of short term investment opportunities and weakinter-bank borrowing system in the banking industry, hence there is excess liquidity in the commercial banks considered and this is because of the mismatch of inflows and out lows of funds which is caused by low economic development and existence of limited financial instruments in the country(Tirualem, 2009).

(Semu ,2010), studied on the possible factors that compel the banks to reduce or restrict lending and it's the impact of reducing or restricting loan disbursement on the performance of banks in Ethiopia. The findings of the study showed that deposit and capital have statistically significant relationship with banks‟ performance measured in terms of return on equity (ROE). New loan and liquidity have relationship with banks‟ performance measured in terms of both return on asset (ROA) and ROE. However, the relationship was found to be statistically insignificant.

The study conducted by (Tseganesh,2012), to identify determinants of commercial banks liquidity in Ethiopia the results of panel data regression analysis showed 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. Real GDP growth rate and loan growth had statistically insignificant impact on banks liquidity. Among the statistically significant factors affecting banks liquidity capital adequacy and bank size had positive impact on financial performance whereas, non-performing loans and short-term interest rate had negative impact on financial performance. Interest rate margin and inflation had negative but statistically insignificant impact on financial performance therefore the impact of bank liquidity on financial performance was non-linear/positive and negative.

Commercial banks are in a risky business. In the process of providing financial services, they assume various kinds of financial risks, and also market participants seek the services of these financial institutions because of their ability to provide market knowledge, transaction efficiency and funding capability in performing such roles they generally act as a principal in the transaction. As such, they use their own balance sheet to facilitate the transaction and to absorb the risks associated with it (Abera, 2012).

As Bank are getting in to saving bond mobilization and management gaining further insight into the liquidity made available is crucial. Liquidity is not only of importance or banks but also for the health and functioning of the real economy the management Of DBE have not been engaged in deposit mobilization for long period. However, currently the saving bond scheme has triggered the necessity of managing liquidity cautiously the results of his study shows GDP growth, Inflation, and Loan growth have statistically significant impact on the financial performance of DBE. While loan growth and GDP growth have positive impact &inflation has negative impact on the financial performance (Natenael, 2013).

The study by(Berhanu,2015) reveals Commercial banks in Ethiopia should identify their optimal level of liquid asset holdings by weighting the marginal costs and marginal Benefits of holding them. The benefits related to cash holdings are: reducing the likelihood of financial distress, allows the pursuance of investment policy when financial constraints are met, and minimizes the costs of raising external funds or liquidating existing assets. The main cost of holding cash is the opportunity cost of the capital invested in liquid assets. Banks will therefore trade-off holding cash and investing it depending on its investment needs.

The result of this study by (Nigist, 2015) confirmed that banks liquidity was highly affected by firm specific variables if compared to macroeconomic variables. The rationality behind was that among macroeconomic variables that chosen for this study, GDP growth rate was the only macroeconomic variable that statistically affected liquidity of Ethiopian commercial banks at 5% significance level.

This study by (Alemayehu, 2016) suggests External factors have influence on liquidity of Ethiopian banks so all commercial banks in Ethiopia that they cannot ignore the macroeconomic indicators when strategizing to improve on their position of liquidity. Thus, banks in Ethiopia should not only be concerned about internal structures and policies/procedures, but they must consider both the internal environment and the macroeconomic environment together in developing their strategies to efficiently manage their liquidity position.

Following the financial crisis of 2007, liquidity risk has become one of the major concerns of financial institutions throughout the world. The financial crisis revealed 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 ,the study was intended to identify the determinants of liquidity of Ethiopian private commercial banks; and hence on the basis of the findings of the study Ethiopian private commercial banks should 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(Mekibeb, 2016).

The study made by (Shimeles, 2016) reveals the requirement of purchasing NBE bill had negative and significant impact on the liquidity position of private commercial banks in Ethiopia. The magnitude of the impact of NBE bill is relatively severe to result in liquidity risk. As revealed in the dummy variable added to the research for pre and post policy periods comparison, banks liquidity has negative association with the post bill purchase period and statistically significant at 5% level of significance. In other words, the two period's comparison showed that lower liquidity record for private commercial banks during times of policy restrictions.

2.7 Summary and literature Gap

The subject of bank liquidity creation has become more and more in focus of research in financial intermediation. The widely accepted view today is that banks create liquidity on both the asset and liability side of their balance sheets by transforming maturities of balance sheet items Berger and (Bouwman,2006**).**

As discussed in detail both in the literature studies as well as from the empirical studies done on the liquidity, it was clear that liquidity and its determinants create contributions to objectives and portfolios of the banking sector, Banks liquidity may affect the performance of a bank and also its reputation and bank may lose the confidence of its depositors if funds are not timely provided to them. Further it emerged that poor liquidity position may cause penalties from the regulator and it therefore became imperative that a bank to keep a sound liquidity arrangement.

Banks must be well organized to deal with the changing monetary policy that shapes the overall liquidity trends and the banks own transactional requirements and repayment of short term borrowing. Commercial banks liquidity problems arise from the liability side of a bank's balance and due to the breakdown or delays in cash flows from the borrowers or early termination of the projects and also originate from banking macro factors that are exogenous and financing and operating policies that are endogenous. A severe liquidity crisis may cause massive drowning in form of bankruptcies and bank failure leading to a drastic financial crisis.

Ethiopian banking industry is on the level of growth stage with the opening of new banks, expansion of new branches, and the re-capitalization of the industry, although these changes have positives impact on the economy and expected to play a crucial role in the development of the country economy.

As mentioned in the literatures the liquidity risk issue is a hot issue and since the world economy is in Globalization and banks are becoming a major part of an economy especially

in Ethiopian case they are the major source of foreign currency so their existence is mandatory,& hence other than recent related studies by (Alemayhu,2016),(Mekbib,2016) and the late study by (Tseganesh,2012) ,Ethiopian banking industry is in the growth stage and the major driver of the economy there is a possibility of emerging active secondary market so it is important identify factors affecting liquidity, this paper includes independent variables such as unemployment and investment in domestic banks which are not mentioned by the related studies and shows the relationship of this variables with liquidity and their impact on liquidity as (Chetty ,2008) revealed the size of liquidity effect of benefit level increases relative to the total effect of unemployment insurance benefits and as it's known in facts that banks deposits in interbank so as to establish adequate liquidity, and Banks reducing liquidity risk by enhancing investment (Diamond and Dybvig 1983; Bencivenga and Smith 1991),hence these variables are important indicators of liquidity in giving wider explanations of the various outcomes of banks risks.

2.8 Conceptual framework

Based on the hypotheses developed from the literature part and the regression model of the study, the following conceptual frame work was developed.

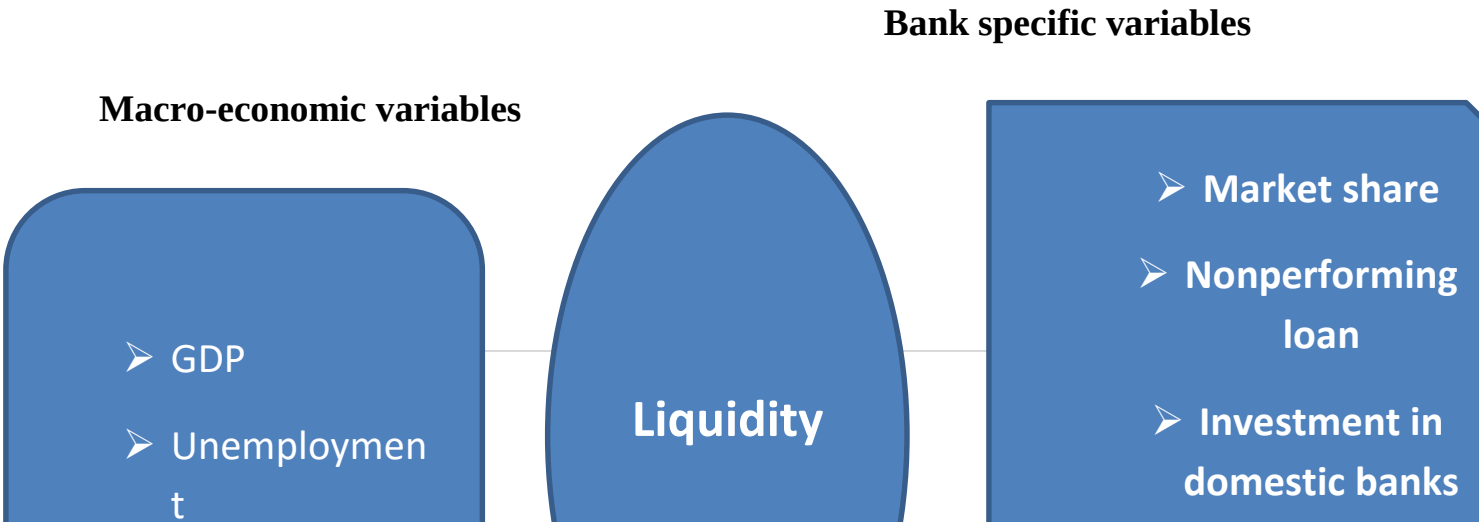


Figure 2.8 Summary of the conceptual framework

Source: Self developed

Chapter Three

Research Methodology

This chapter will explain the research design, the population of interest, the basis of samples selection, the secondary data used, and the sources of data with the techniques of analysis and the data processing.

3.1 Research Design and Approach

(Burns and Grove, 2003) define a research design as a blueprint for conducting a study with maximum control over factors that may interfere with the validity of the findings. There are three types of research design: exploratory research design which uses preliminary data to develop an idea further, Such as outline concepts, gather insights &formulate hypotheses the second is descriptive research design: which describe an

element of ideas precisely, the third is Causal research design which tests a cause and effect relationship.

The study is based on explanatory research design, which is used to connect ideas by understanding and identifying the extent and nature of the cause and effect relationships between variables by adopting secondary sources then balanced panel data is applied because it is important in giving more informative and variability data and provides multiple observations of each individual in the sample by increasing degree of freedom to the explanatory variables.

The study applies quantitative research approach as (Creswell ,2009), the quantitative approach enables the researcher to test objective theories in the real world by constructing the cause and effect relationship between variables and promote replication of a research, quantitative research's major importance is that it clearly defines the topic of the study through emphasizing on methodology, procedure and statistical measures of validity by relying on the measurement and analysis of statistical data to produce quantifiable conclusion in nature.

3.2 Data source and Method of Data Collection

The research gather important data's from secondary source by making reference to documents available within the financial statements of selected banking sectors annual reports for the periods covering 2001 to 2017 why this time frame is chosen is to increase the number of observations and obtain reliable results, and data's on macroeconomic

explanatory variables collected from National bank of Ethiopia, central statistical agency, and the recent Ministry of Finance and Economic Corporation.

3.3 Sampling techniques and study population

According to NBE there are eighteen commercial banks recently of which two of them were publicly owned and sixteen of them are privately owned, among the sixteen private commercial banks six of them have more than seventeen years of data in which are the study population these banks are Dashen Bank, Awash Bank, Bank of Abyssinia, Wegagen Bank, NIB International Bank and United Bank hence, the matrix for the frame was 17*6 that included 102 observations ,the reason behind selecting seventeen years data is that most related studies has been conducted till 2015 and to increase the sample and cover the datas which are not used by other researchers the seventeen years data was selected, The study uses one of non-probability sampling method type which is purposive sampling this technique is selected based on characteristics of a population and objective of the study ,and based on the knowledge about the study and population , the study uses this technique because it believes the method best meets the purposes of the study and it provides justification to make generalizations from sample that is being studied and also it reached a targeted sample quickly.

3.4 Description of variables and their Measure

Variables	Notation	Measure

Liquidity	LQ	Total loans to total deposits and short term borrowing
Gross domestic product	GDP	Annual economic growth rate of Ethiopia
Unemployment	UN	Annual unemployment rate of Ethiopia
Investment in domestic banks	INDB	Ratio of Deposit in domestic bank to total asset
Market share	MS	Summation of market share of individual banks to the total no of banks based on number of branches of the banks
Non performing loan	NPL	Share of non-performing loans on total volume of loans

3.5 Methods of Data Analysis

Data analysis means to organize, provide structure and elicit meaning; analysis of quantitative data is an active and interactive process (Polit et al, 2001). Data was analyzed & presented using descriptive & inferential statistics and multiple regression analysis to conduct the relationships between the dependent and independent variables.

Descriptive statistics uses sample information to explain and make abstraction of population and phenomenon over sample periods, through deploying multiple regression analysis which uses sample statistics to infer some phenomena of population parameters.

Regression analysis is the other analysis method used which is concerned with the study of the dependence of one variable, the dependent variable, on one or more other variables, the explanatory variables with a view to estimate and predict the population mean or

average value of the former in terms of the known or fixed in repeated sampling values of the latter,

using panel data a model is formulated and run for hypothesis testing, the regression model ran from the financial reports of the banks that had been in operation since 1994, it is one of panel data model which enables to control for unobserved heterogeneity among cross sectional units and to get the true effect of the explanatory variables.

Then classical linear regression with four diagnosis test assumptions will be explained and which evaluate the degree of relationship between the dependent and the explanatory variables hence the data analysis process will encounter first descriptive& inferential analysis of the model followed by scale measurement then the multiple regression analysis will be analyzed through diagnosis tests by using EVIEWS 8 econometrics software package to test the causes and effect relationship between the banks liquidity and its factors.

3.6Model Specification

The General model for the research is: -

$LIQit=\beta 1\ GDP+ \beta 2\ UN+ \beta 3INDB+ \beta 4\ MS+ \beta 5\ NPL+\varepsilon it$

$$\mathbf{Yit=\beta 1i + \beta 2Xit +\varepsilon it}$$

Whereas

- Yit is the Dependent variable, where i = entity and t = time.
- Xit represents one Independent variables
- B1is the coefficient for that particular independent variables
- εit is the error term

Where as

LIQit=the dependent variable (i.e. Liquidity of banks i at time t)

i =entity,

t =time,

εit=the error term.

Independent variables

GDPt = is the gross domestic product/GDP growth of Ethiopia on the year t.

INDBt=investment in domestic banks on year t

UNt=is the unemployment rate on year t

MSit = is market share for bank i at time t.

NPLit = is the non-performing loans for bank i at time t.

εit= is a random error term

3.7 Model Validity

To check the model validity the study applies various methods first it applied descriptive statistics for describing the basic features of data by summarizing statistical central tendency of data ,then next to examine both bank specific and macroeconomic factors the study applies fixed effect model by using hausman test of scale measurement and then the study applies four diagnosis tests for model validity among them is multicollinearity test ,the model verifies the expected sign for independent variable consistency with theory or prior expectation for checking the multicollinearity problem and by examin ing the correlation matrix provided by Eviews8,then the researchers have to make sure that the model is free from heteroscedasticity to obtain a precise and interpretable result, a hypothesis test is carried out using Eviews8,then autocorrelation test is carried out by

examining DW value obtained from the test, then the normality of error term is examined through informal way which is using the graph to detect the pattern of the residual.

3.8 Operational Definition and Conceptual Framework

3.8.1Dependent variable

Liquidity

Liquidity is a bank's ability to finance an increase in assets and to meet the repayment of liabilities as they come due, the study measures liquidity of selected private commercial banks as loan to deposits & short term borrowing ratio.

- Loans to Deposit & Short Term Borrowing Ratio

Loans& advances are 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, No SBB/43/2008.

$$LI = \frac{\text{loans}}{\text{Deposits + short term borrowings}}$$

3.8.2 Explanatory Variables

GDP

GDP is the total market value of countries output with production factors located within a country (Karl E, Ray C and Sharon M ,2009)

- GDP is measured by annual Growth rate of Ethiopia

Unemployment

Unemployment occurs when a person who is actively searching for employment is unable to find work; it is often used as a measure of the health of the economy.

- Unemployment is measured by unemployment rate of Ethiopia.

Investment in domestic banks

Investment in domestic banks is the amount of deposits found in the inter bank accounts.

- Deposits in domestic bank/total assets

Market share

Market share is the degree of concentration measuring the competition level of a certain industry by identifying the degree of completion in the market considering the size of each bank in relation with the industry.

- Market share is measured by HHI level which is summation of market share of individual banks to the total number of banks in the industry based on the number of branches of the banks.

Non-performing loan

Non-performing loan is a loan that is in default or close to being in default. Many loans become non-performing after being in default for 90 days, but this can depend on the Contract terms (Abdul ,2009).

- Share of non-performing loans on total volume of loans

Chapter four

Data Presentation and Analysis

Under this chapter the collected data will be presented and analyzed precisely by interpretation of the results from the tests of classical linear regression model diagnosis test and the findings of the study will be interpreted based on the research objectives, the researcher used six commercial banks in Ethiopia over seventeen years' time span which is from 2001 to 2017.

The data extracted by the researcher were obtained from annual reports from each bank and for the macroeconomic factors, the data is extracted from NBE,CSA&MoFEC, through the use of E-views 8 software the researcher analyze the findings and the results of regression with descriptive & inferential statistics .

4.1Descriptive statistics

Descriptive statistics are useful for describing the basic features of data by summarizing statistical central tendency of data as measured by the mean, median, and mode by showing how spread out data are, as measured by the standard deviation and presented in summary table, it is possible to describe the variables that were the subject of research by reducing the amount of data obtained in the study to a small number of measures and their presentation in statistically acceptable manner.

Table 4.1.1 Descriptive statistics of variables.

	Mean	**Maximum**	**Minimum**	**Standard deviation**	**Observation**
LQ	0.2369	0.6392	0.07622	0.1052	102
GDP	0.0969	0.1260	-0.0210	0.0324	102
UN	0.0528	0.0680	0.0500	0.00397	102
INDB	0.05813	0.3420	0.000	0.0630	102
MS	0.1873	0.2156	0.1802	0.0080	102
NPL	0.5343	0.6970	0.3610	0.0890	102

Source: 2001 -2017 Banks annual report and researchers' computation of Eviews 8

Under Table 4.1.1 the descriptive statistics of the dependent and independent variables with 102 observations results shows that, first when we see the mean value of LQ the result shows

23.69%, the revised NBE Directives No. SBB/57/2014 requires banks minimum liquidity requirement to be 15% in which the result obtained is above this requirement ,the 23.69% value implies that the selected banks have adequate liquidity capacity which is above the statuary limit set by the regulating body thus this implies the selected commercial banks will meet the bank liquidity regulation which creates a commitment device on repaying depositors in bad states, stimulate a deposit inflow and moderating the limited liability inefficiency, the standard deviations is 10.52% which is the average difference between observed values and the mean measured as the ratio of loans to the total deposit of the bank expressing dispersion in the same units as the original measurements, this implies that loan to deposit and short term borrowing ratio has a moderate dispersion along its mean value hence the result shows that liquidity has minimum value 7.6% which is evidence by Nib international bank for the year 2015 and maximum value 63.9%which is evidence by bank of Abyssinia in the year 2002 .

If we see the result of one of the macroeconomic factor that is GDP ,measured as the ratio of Real GDP to Nominal GDP, the mean value shows that Ethiopia is experiencing9.6% average GDP for the years ranging from 2001-2017, according to the world bank report in 2017 Ethiopian economy is projected to decelerate to 9.6% in 2018 as a result of improvements in logistics and ongoing large industrial parks developments boosts the economy, thus this has a direct impact on banks liquidity in which the higher investments the higher banks liquidity, the standard deviation of GDP implies a 3.24% which indicates that Ethiopian economy has a moderate dispersion along the mean value, and it has a maximum value of 12.6% recorded in the year 2005 and the minimum value of -2.1% is experienced in the year 2003.

The next macro explanatory variable is unemployment rate which is measured by annual unemployment rate has a mean value of 5.28%, implies that Ethiopian unemployment rate changes every year with an average rate of 5.28% annually and has a maximum rate of 6.8% registered in the year 2001 and minimum rate of 5% registered in the years 2013-2015 and the standard deviation of 0.39 % shows that the spread of unemployment rate is far away along the mean values over the sample years.

Among the bank related explanatory variables, investment in domestic banks is the other variable measured as deposit in domestic commercial banks to the total asset which has a mean value of 5.81% which implies that on average sample banks invest at 5.81% in local banks and the standard deviation of 6.3% indicates that it is clear investment in domestic banks is more dispersed along its average value and the result shows that no minimum value because in some years sample banks didn't not invest in domestic banks but the maximum value is 34.2% which is the percentage amount of bank of Abyssinia deposit in domestic banks for the year 2008.

The other bank specific variable is NPL which is measured by Non-performing loans to total loans and advances have a mean value of 53.4% which implies that on average sample banks have 53.43% non performing loans showing that they have credit default ,on this date, the NBE issued a directive requiring all commercial banks to hold 27% of new loan disbursements in NBE bills, it is also important to highlight that the NBE Bills are not a profitable asset, as they pay a fixed remuneration of 3% per year, and the standard deviation of 8.9% implies the amount of nonperforming loan has a small amount of

dispersion along the mean value ,where as the maximum amount of 69.7% implies there is high credit risk in sample banks which affects their liquidity in a way that it decreased the amount of cash availability of banks and the minimum value of 36.1% was on wegagen bank for the year 2008.

The last variable is market share which is measured by summation of market share of individual banks to the total number of banks in the industry have a mean value of 18.7% ,which implies that sample commercial banks have 18.7% concentration level in the market from the total banks, hence the standard deviation of 0.80% implies that the level of concentration by the banks is far away from its mean value shows a less dispersion, the maximum value of 21.56% indicates the highest market share of the banks recorded by awash bank which is the first private bank in year of establishment.

4.2Scale Measurement

4.2.1Hausman test

To select the appropriate model the study has to choose between fixed or random effect model a formal test so called hausman test was used which was based on the null hypothesis in favor of random effect model estimator. If p value is higher than 0.05 (i.e. it is insignificant) hence random effects is preferable whereas if p value is lower than 0.05 (i.e. it is significant) fixed effect is preferable (Gujarati 2004). Hence From table 4.1.2, the p-value is 0.0031 which makes the researchers to reject null hypothesis at significance level of 5%, this concludes that fixed effect model is the appropriate model.

H0: Random effect model is better than fixed effect model

H1: Fixed effect model is better than random effect model

Test Statistics Value
Prob. Chi- Square = 0.0031

Table 4.2.1.Hausman test from E-view 8output

4.3Test of the classical linear Regression Model (CLRM)

CLRM diagnosis test was tested to know whether the data and the model for this study was fit or not mainly three problems were encountered the coefficient estimates are wrong, the associated standard errors are wrong, and the distribution we assume for the test statistics will be inappropriate.

4.3.1Test for Normality Assumption

The Classical Linear Regression Model assumes that the error term is normally distributed with the mean of error being zero as positive error will offset the negative error. The normality of error term can be examined through graph to detect the pattern of the residual. For the residuals to be normally distributed the histogram should be bell-shaped and the Bera-Jarque statistic would not be significant, this means that the p value given at the bottom of the normality test screen should be bigger than 0.01 to not reject the null of normality at the10% level (Brooks 2008).

H0: The error term is normally distributed

H1: The error term is not normally distributed.

In the results of Figure 4.3.1 below the normality test has p-value of 0.158206 which is greater than significance level of 5% and the kurtosis is approaching to 3 that is 3.440177,Since the p-value for Jarqua-Bera statistic >significance level 5% thus ,we do not reject H0 and conclude that the error term is normally distributed

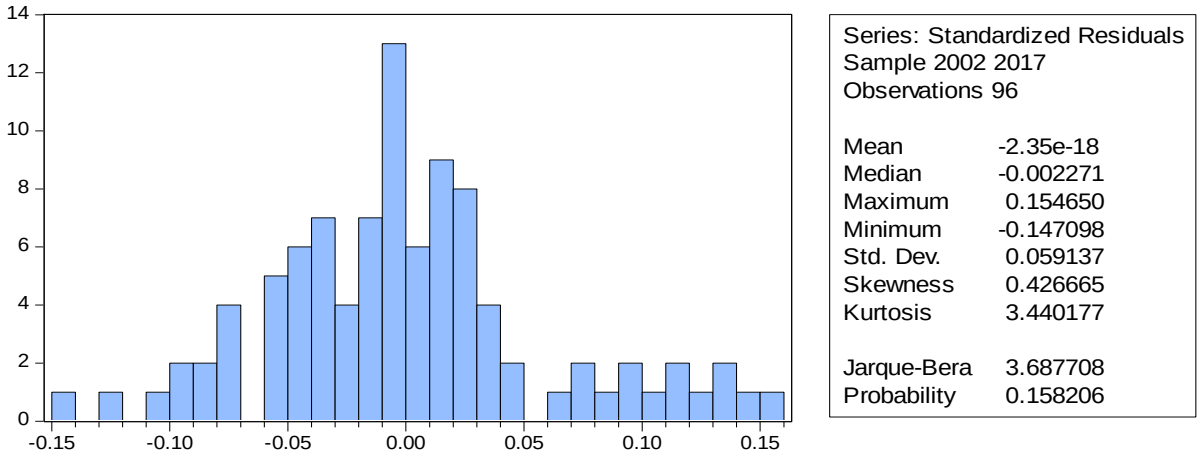


Figure 4.3.1Normality Test result from E-view output

4.3.2 Test for Heteroscedasticity Assumption

Heteroscedasticity means the variance of error is not constant, it is assumed that when the variance of errors is constant it's called homoscedasticity but heteroscedasticity occurs when the variance of error term is not constant across the number of observations to make sure that the model is free from heteroscedasticity to obtain a precise result, a hypothesis test is carried out using p-value, if the result of the p-value is more than 5% significance level, it implies that the model does not have heteroscedasticity problem, the results of diagnostic checking for heteroscedasticity below shows that the p-value is 0.1111which is greater than significance level of 0.05,this made the researchers not to reject the null hypothesis and conclude that there is noheteroscedasticity problem at Significance level of 5%.

Table 4.3.2Heteroskedasticity Test: white

F-statstics	1.509937	Prob.F(27,73)	0.0848
Obs *R-squared	36.19284	Prob.Chi-square(27)	0.1111

Source: 2001 -2017 banks annual report and researchers' computation of Eviews

4.3.3Test for Autocorrelation Assumption

The test for autocorrelation was made by using Durbin and Watson, (DW) is a test for first order autocorrelation i.e.it tests only for a relationship between an error and its immediately previous value. DW is approximately equals to $2(1 - \hat{\rho})$, where $\hat{\rho}$ is the estimated correlation coefficient between the error term and its first order lag (Brooks,2008). Hence, as per the regression output, the value of Durbin-Watson stat is 1.896330,this revealed that there was no serious evidence of autocorrelation in the data since the DW test result approaches twobecause as per (Brook,2008) stated above there is no autocorrelation problem if the DW is near 2.

Table 4.3.3 AuthocorrelationTest

Test Statistics Value
Durbin-Watson statistic = 1.896330

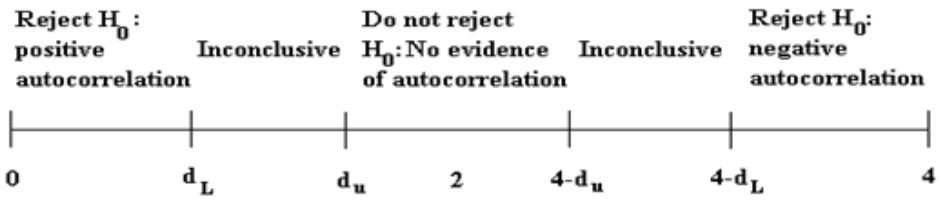


Figure 4.3.3Rejection and Non-Rejection Regions for DW Test

4.3.4Test for Multicollinearity Assumption

Correlation is a way to figure out the degree to which two or more variables are associated with or related to each other, it's said that y and x are correlated when y and x are being treated in a completely symmetrical way thus, stating that there is evidence for a linear relationship between the two variables, and that movements inthe two are on average related to an extent given by the correlation coefficient (Brooks,2008),If an independent variable is an exact linear combination of the other independent variables, then we say the model suffers from perfect collinearity, and it cannot be estimated by OLS (Brooks 2008). The condition of multicollinearity exists where there is high, but not perfect, correlation between two or more explanatory variables (Cameron and Trivedi 2009; Wooldridge 2006).

Table 4.3.4 Correlation Matrix of variables

	LQ	GDP	UN	NPL	INDB	MC
LQ	1					
GDP	-0.13873	1				
UN	0.063837	-0.12754	1			

NPL	0.139021	-0.09993	0.402625	1		
INDB	0.440055	0.067426	-0.08104	0.078063	1	
MC	0.39513	-0.32635	0.613514	0.593223	-0.07489	1

Source: 2001 -2017 banks annual report and researchers' computation of Eviews 8

(Hair et al, 2006) argue that correlation coefficient below 0.9 may not cause serious multicollinearity problem. (Malhotra ,2007) stated that multicollinearity problem exists when the correlation coefficient among variables is greater than 0.75. (Kennedy ,2008) suggests that any correlation coefficient above0.7 could cause a serious multicollinearity problem leading to inefficient estimation and less reliable results, hence the correlation matrix table 4.3.4, the highest correlation value of 0.6135 was observed between unemployement and market share. Since there is no correlation value above 0.7, 0.75, and 0.9, it was possible to conclude that there was no multicollinearity problem in this study.

4.4 Inferential Analysis

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP	0.0803	0.2098	0.3828	0.7028
UN	-11.4662	6.51789	1.7591	0.0822
INDB	0.4796	0.1259	3.80866	0.0003***
MS	9.010384	1.375084	6.5526	0.0000***
NPL	-.043396	0.106705	-4.06693	0.0001***

R-square	0.701656	DW-stat = 1.89633
Adjusted R-square	0.662587	
Prob.(F-statistics)	0.000000	

***significant at 1 %(strong effect)

4.5Results of the Regression Analysis

Under the following regression outputs the beta coefficient may be negative or positive beta indicates that each variable's level of influence on the dependent variable, P-value indicates at what percentage or precession level of each variable is significant. R2 values indicate the explanatory power of the model and in this study adjusted R2 value which takes into account the loss of degrees of freedom associated.

4.5.1 R-square

The range of R-squareis from 1 to 100%. If the R-square value is close to 1%, it means that less variation of Y can be explained by the variation of X. If R-square is close to 100%, it means that high variation of Y can be explained by the variation of x. However, if R-square equals to 0, it is mean that there is no variation of Y that can be explained by variation of According to table 4.2 regression results, R2 has the value of 66.25% in which it is interpreted as 66.25% variations of liquidity in the selected commercial banks were explained by the above seven explanatory variables whereas the remaining33.75%

variation of liquidity in Ethiopian commercial banks were explained by other variables which goes to the error term.

4.5.2Macroeconomic factors

4.5.2.1 Gross Domestic Products (GDP)

Gross domestic product was among the macroeconomic variables that have positive and statistically insignificant impact on liquidity of Ethiopian commercial banks with the p-value of 0.7028 and coefficient of 0.080344 and the coefficient indicates that a unit increases in annual real GDP rate leads to 0.080344 unit increase in liquidity of Ethiopian commercial banks holding other variables constant.

GDP growth rate is used as a proxy of business cycle in which banks operate, and controls for variance in liquidity due to differences in business cycles which influence the supply and demand for loans and deposits ,this implies during economic boom phases, firms which have higher profits prefer to consume internal source of finance and reduce their external finance which in turn reduce their debit amounts, and increase their liquidity position, This is because an increase in economic activities of the country signals that customers' demand for loans will increase, and with improved lending activities, banks are able to generate more profits and accelerates liquidity, thus liquidity creation is one of the most important roles that banks play in the economy. Bank liquidity creation incorporates loans, deposits,

off-balance sheet guarantees, derivatives, and all other balance sheet and off-balance sheet financial activities which is theoretically linked to the economy. Bank loans, particularly those to bank dependent customers without capital market opportunities, are often thought to be primary engines of economic growth (Smith, 1776; Jayaratne a& Strahan, 1996). Transaction and deposits provide liquidity and payments services which are essential to a well-functioning economy (Kashyap, Rajan, and Stein, 2002), hencethe hypothesis stating that GDP has negative effect with liquidity will be rejected.

4.5.2.3 Unemployment and Liquidity

Unemployment rate was next macroeconomic variable of this study found to be negative and statistically insignificant with coefficient of -11.4662 and p-value of 0.0822 in explaining liquidity of Ethiopian commercial banks and the negative coefficient indicates inverse relationship between unemployment and liquidity of Ethiopian commercial banks, the relationship is interpreted as holding other variables constant a one percent increase in unemployment rate decreases liquidity of commercial banks in Ethiopia which is due to high unemployment rate the number of potential borrowers as well as the ability of current borrowers to repay loan are reduced which entails a reduction in the credit worthiness of borrowers and banks' credit activities, an increase in the unemployment rate also reduced capital and hampered liquidity creation.

In terms of policies, an increase in public liquidity increases supply of real government bonds& raises interest rates by reducing the convenience yield on liquid assets which in turn reduces entry of firms, and increases unemployment. An open-market sale of nominal government bonds by a central bank which withdraws currency or bank reserves from the

economy redistributes liquidity across trades as narrow liquidity & shrinks while broad liquidity expands. These changes in the composition of liquidity lead to higher interest rates and higher unemployment rates. (Guillaume and Antonio, 2014), thus the hypothesis stating that unemployment has negative effect on liquidity will not be rejected.

4.6 Bank specific factors

4.6.1.Investment in domestic banks and Liquidity

Investment in domestic banks is one of the bank specific factor which have positive and statistically significant impact on banks liquidity, with coefficient of 0.479684 and p-value of 0.0003 the positive sign implies that holding other variables constant a 1% increase in interbank interest rate leads to a 53.4% increase in Ethiopian banks liquidity it is known that banks deposit in other banks in order to decrease their fear of liquidity in the future, it's shown in the result that most of the banks deposit in inter banks with higher interests, thus this increase their safety margin and in order eliminate shocks to redistribute liquid assets among them, boosting of deposits is of great importance for Ethiopian private banks to achieve and sustain an increased investment rate and economic growth. An increase in income leads to a rise in bank deposits which in turn leads to an increase in liquidity position of banks, and efficient allocation of banks resources. Investments are important source of funds and are assets for banks, banks deposit in inter banks to hold a positive amount of capital as a way to reduce bankruptcy costs when investing directly in a risky technology, the finding of this study was in consistent with Xavier, Antoine &David,(2010),thus the hypothesis stating that investment in domestic banks has positive effect on liquidity will not be rejected.

4.6.2 Non performing loan and Liquidity

It's found that NPL has negative and statistically significant impact on liquidity of commercial banks in Ethiopia with coefficient of -0.433962 and p-value of 0.0001 the coefficients are interpreted as by holding other variables constant an increase in NPL by 1percentage causes liquidity of Ethiopian commercial banks ratio to decrease by 43.3% units, this indicates that higher NPL, the lower bank liquidity, according to (Van Gestel&Baesens ,2009), non-performing loans have been the most principal and perhaps the most important risk type that has been present in banks, this result is supported by the study of Clifford and Michael (2012), indicating that NPLs have a negative relationship towards bank performance be it liquidity or profitability this exists when a bank involves in excessive lending, also the study's result is inconsistent with the studies of (Berhanu ,2015),which explains that here is less incentive for bank to reduce lending and improvement may be the result of better internal risk management, the possibility of defaulting loans increase causes a decrease in liquidity and banks' exposure to risk .Adequately managing of those risks related with credit is critical for the survival and growth of any financial institution, thus the hypothesis stating that non performing loans has negative effect on liquidity will not be rejected.

4.6.3 Market share and Liquidity

It's found that market share has positives and statistically significant impact on liquidity of commercial banks in Ethiopia with coefficient of 9.010384 and p value of 0.0000 the coefficient from this study states that by holding other variables constantan increase in market share of banks by 1percentage point causes liquidity of Ethiopia commercial banks ratio to increase by 9% units, this result is interrelated as this indicates that the higher market share, the higher the bank liquidity, the Ethiopian banking industry can be

characterized as highly profitable, concentrated and moderately competitive, in terms of contestability, the banking industry can be characterized as incontestable as entry in the industry is difficult, this result for banks to stay liquid and profitable for longer peiods,interms of market concentration ,the degree of competition among banks in Ethiopia is less since there are no foreign banks operating in the country, the competition and concentration lies among the domestic banks, this makes banks to have a moderate risk and to increase their quality of lending portfolios and balance sheets ,which results in increase of their liquidity capacity by making them to have high resources and in turn increases investments., this result is supported by the work of (Douglas,2014)which reveals that the amount of liquidity that banks offer depends on the degree of direct participation in the market ,thus the hypothesis stating that market share has positive effect on liquidity will not be rejected.

Independent variable	Expected impact	Actual impact
Liquidity		
GDP	Negative&significant	Positive&insignificant
UN	Negative&significant	Negative&insignificant
MS	positive&significant	Positive&significant
INDB	positive&significant	Positive&significant
NPL	negative&significant	Negative&significant

Table 4.5.1Summary of actual and expected signs of explanatory variables on the dependent variables

Chapter Five

Summary and Findings

This chapter will provide overall conclusion of the entire research and summary of statistical analysis. Besides that, it also provides the discussion of the major findings and implication of the study. Lastly, researchers also suggest some recommendations for future researchers, based on the findings and conclusion.

5.1 Conclusion

The objective of this study was to find out the factors that determine liquidity of selected Commercial banks in Ethiopia, its stated in the literatures that balanced liquidity creation is the main reason why commercial banks exist, liquidity was the dependent variable and the researcher perused to identify the outcome of GDP, unemployment, investments in domestic banks, non-performing loans, and market share on liquidity of six Commercial banks in Ethiopia for the time frame of 2001-2017, the correlation and regression analysis for the liquidity ratios exposed that among the five variables three factors are related and are statistically significant to liquidity which are investments in domestic banks, non-performing loans and market share.

The study established the coefficient for investments in domestic banks is 0.479684, meaning that investments in domestic banks has positive coefficient and is statistically significant, the study further revealed that the coefficient for non performing loan was -0.433962 meaning that non performing loan has negative and significant effect on liquidity ,then study also established that the coefficient for market share was 9.010384, meaning that market share positively and significantly influenced liquidity and then and then the result shows that GDP has a coefficient of 0.080344 which indicates that it has positive and statistically insignificant impact on Ethiopian banks liquidity Finally the study revealed that unemployment has a coefficient of -11.46621 meaning that it has an inverse relationship with liquidity of commercial banks ,thus the researcher believes that it answers the research questions and meet the objectives of the study by determining the significant factors affecting liquidity of selected commercial bank and ensuring the ability to meet up depositor's demand and maximize their shareholder value.

Finally the researches' model result shows that among the five independent variables non performing loan, investment in domestic banks and market share are the three variables found to have statistical significant impact on liquidity of the selected commercial banks, further the findings revealed that the value of adjusted R squared was 0.662587 indications thatthere was variation of 66.25 percent on liquidity of selected commercial banks in Ethiopia.

5.2 Recommendations

The liquidity position of a bank is very sensitive to many factors and in order to deal with various effects banks should develop a system that could forecast unemployment rate and gross domestic product based on past data ,this study also assists banks in their decision making by indicating essential factors such as non performing loan, investments in domestic banks, and market share in addition, banks at all times should remain liquid in all their activities to mitigate and eliminate shocks in the event of financial crisis thus, the study enables banks to make decision making regarding the issue on liquidity and communicate it to the government and to solve the occurrence of financial crisis happening in future.

Sufficient liquidity is the major financial stability indicator of banks, poor liquidity management causes systemic crisis in the banking sector so banks should establish sufficient capital and reduce non performing loans to obtain extra liquidity ,(Hartmann ,2004) indicates that liquidity is a major component of risk and banks should set aside reserves of capital to mitigate this risk and for formal capital decision by keeping capital reserves above the required limit set by the regulatory body in order to have a buffer against shocks to asset prices.

This study will indicate policy directions for commercial banks to have sustainable liquidity based on the factors that mainly affect liquidity they should establish appropriate practices of various factors which will ensure that liquidity is looked after in the best way possible, and that adequate liquidity mitigation management measures are put in place and standards are being practiced on a day to day basis.

The findings provide shareholders and concerned personnel's with information that they have a significant part to force commercial banks administration to implement appropriate decisions, and also it recommend managers to implement decisions towards efficient liquidity management.

It also create control instruments by informing the government that it has to be concerned with good macroeconomic factors practices in banking industry since they are the major influential sectors in the economy. It advices banks to hold periodic discussion with regard to financing sources and shall make decisions on composition, characteristics and diversification of the sources with the object of diversifying the liabilities.

Commercial banks should also develop training programs for their managerial personnel, as well as for board members, aiming at improving and advancing their operations; also Banks must integrate their liquidity difficulties into a single stream of capital measurement to have a comprehensive picture of their entire resources.

The study also suggests that further studies should be done on another factors affecting liquidity and establish their result in order to cite additional outcomes, and recommends that liquidity of commercial banks can be affected by both bank specific and macroeconomic factors and future research could practically use a more complicated econometric model or dynamic panel model where it could capture the possible effect of independent variable on dependent variable.

Banks must ensure that they have sufficient liquidity to meet all relevant regulatory requirements, plus a buffer to reduce the likelihood that liquidity falls below these

thresholds and triggers a regulatory or market response or creates constraints on the bank's actions by considering that they have sufficient liquidity and banks also they should try to hold the probability of a crippling liquidity crisis to below some fraction of a percent each year, based on their internal modeling.

This study paves the way for more detailed studies into controlling the liquidity fear and to extending the proposed model to incorporate other causes of liquidity problem by recommending that banks increase their customer deposit base through making the product accessible to more customers especially the low income earners who have been neglected for a long time by the mainstream banks, they should also consider targeting the corporate clients who will be willing to retain a large cash base in the banks for a longer duration.

Banks can increase their liquidity in multiple ways, each of which ordinarily has a cost which are by shortening asset maturities, improve the average liquidity of assets Lengthen liability maturities, issue more equity and by reducing contingent commitments Obtain liquidity protection.

REFERENCES

Al-Tamimi, H.A.H. and Al-Mazrooei, F.M. (2007), "Banks' risk management: a comparison

Study of UAE national and foreign banks", The Journal of Risk Finance, Vol. 8 No. 4, pp.394-409.

Al-Khouri, R. (2012): Bank characteristics and liquidity transformation: The case of GCC banks. International Journal of Economics and Finance Vol. 4, No.12, pp. 114-120.

Al.

Aspachs, O, Nier, E and Tiesset, M 2005, 'Liquidity, Banking Regulation and Macroeconomy: Evidence on bank liquidity holdings from a panel of UK-resident banks', Bank.

Allen, F and Santomero, AM 1998, „The theory of financial intermediation; Journal of Banking and Finance No. 21, pp.1461-1485 .

Andries, AM 2009, A comparative analysis of performance and soundness indicators of the
main Romanian banks, Scientific Annals of the 'Alexandru Ioan Cuza' University of Iasi: Economic Science Series, Vol.56, pp. 45-70.

Basel Committee on Banking Supervision (2008), "Principles for sound liquidity risk management and supervision", available at: www.bis.org/publ/bcbs138.htm.

Brunnermeier, M. and Pedersen, L.H. (2009), "Market liquidity and funding liquidity", Reviewof Financial Studies, Vol. 22 No. 6, pp. 2201-38.

Berger, A and Bouwman, C 2007, „Bank Liquidity Creation", Working Paper.

Berger, AN and Bouwman, C 2008, Financial Crises and Bank Liquidity Creation; Working Paper, Wharton Financial Institutions Center, pp. 8-37.

Bordeleau, E & Graham, C 2010, The impact of liquidity on bank liquidity; Bank of Canada, working paper.

Chagwiza, W 2011, Zimbabwean Commercial Banks Liquidity and Its Determinants, International Journal of Empirical Finance, Vol. 2, No. 2, PP.52-64 .

Chaplin, G, Emblow, A and Michael, I 2000, Banking system liquidity: developments and issues, Bank of England FSR.

Chen, N &Mahajan, A 2010, Effects of macroeconomic condition on banks liquidity, International ResearchJournal of Finance and Economics; No.35, pp. 112-129.

Diamond, D W and Dybvig, P H 1983, 'Bank runs, deposit insurance, and liquidity', Journal of Political Economy,Vol. 105, No. 91, pp. 401-419.

Diamond, D W and Rajan, RG 2000, „Theory of bank capital", Journal of Finance, Vol.100, No. 55, pp. 2431-2465 .

Diamond, D W and Rajan, R G 2001, "Liquidity risk, liquidity creation, and financial fragility: a theory of banking", Journal of Political Economy, Vol. 109, No. 2, pp.287 .

Diamond, D W. and Rajan, R G 2005, „Liquidity shortages and banking crise", Journal of Finance,Vol. 60, No. 2, pp.615-647.

Duttweiler, R. (2009), Managing Liquidity in Banks, Wiley, Singapore.

Douglas J. Elliott (June, 2014). The Brookings Institution .Bank Liquidity Requirements, An Introduction and Overview.

Dimitri Vayanos and Jiang Wang.Vol. 6, No. 4.Theories of Liquidity. London School of Economics, CEPR and NBER, UK, Massachusetts Institute of Technology, CAFR and NBER, USA.

Doris Madhi The Macroeconomic Factors Impact on Liquidity Risk: The Albanian Banking System Case Jan-Apr 2017 Vol. 7 Nr. 1 University Aleksander Xhuvani, Faculty of EconomyEuropean Journal of Economics and Business Studies.

Ericsson, J & Renault, M 2006, Liqudity and credit risk, Journal of finance; McGill University, No.5, pp. 19-50.

Fecht, F., Nyborg, K. G. & Rocholl, J. (2011). The price of liquidity: The effects of market conditions. Journal of Financial Economics, 102, 344-362.doi:10.1016/j.jfineco.2011.05.015.

Gujarat, D.N 2004, Basic Econometric; 4th edn., McGraw–Hill, USAHair, J F, Black, W C, Babin, B J, Anderson, R E, and Tatham, R L 2006, Multivariate Data Analysis, 6th edn, New Jersey: Pearson Education.

Garber, P and Weisbrod, S 1992, The Economics of Banking, Liquidity and Money; working paper.

Gujarat, DN. (2004): Basic Econometric, 4th edn. McGraw–Hill, USA.

Guglielmo, M.R. (2008), “Managing liquidity risk”, Bank Accounting & Finance, Vol. 8.

Goodhart, C. (2008), “Liquidity risk management”, Financial Stability Review, Vol. 11 No. 6.

Gorton, G and Winton, A 2000, „Liquidity provision, bank capital, and the macro economy“, University of Minnesota, Working Paper.

Holmstrom, B and Tirole, J 2010, „Private and public supply of liquidity“, Journal of Political Economy, Vol. 106, No. 1, pp.1-40 .

Hou, Y 2004, The nonperforming loan; some banking level evidence, Journal of economics And finance, pp. 1-29.

Jenkinson, N. (2008), “Strengthening regimes for controlling liquidity risk”, Euro Money Conference on Liquidity and Funding Risk Management, Bank of England, London, p. 9.

Iannotta, G, Nocera, G, and Sironi, A 2007, „Ownership Structure, Risk and Performance in the European Banking Industry“, Journal of Banking & Finance, Vol. 31, pp. 2127-2149 .

Jenkinson, N 2008, Strengthening regimes for controlling liquidity risk;Euro Money Conference on Liquidity and Funding Risk Management, Bank of England, London.

Jana Laštůvkova1 (November, 2016) . Liquidity determinants of selected banking sectors and their size groupVolume 64 Number 3

Kashyap, A.K., Rajan, R. and Stein, J.C. (2002), "Banks as liquidity providers: an explanationfor the coexistence of lending and deposit-taking", Journal of Finance, Vol. 57 No. 1, pp.33-73.

Kennedy, P 2008, a Guide to Econometric. 6th edn., Blackwell Publishing, Malden

Lartey, V. C., Antwi, S. & Boadi, E. K. (2013). The relationship between liquidity and profitability of listed banks in Ghana. International Journal ofBusiness and Social Science, 4(3), 48-56.

Nigist Melese& Dr. Laximikantham. Assessment of Banks Liquidity: Empirical Evidence on EthiopianCommercial Banks .Developing Country Studies www.iiste.orgISSN 2224-607X (Paper) ISSN 2225-0565 (Online) Vol.5, No.21, 2015.

Moore, W and Bassis, J 2009, 'How do financial crises affect commercial bank liquidity?: Evidence from LatinAmerica and the Caribbean.

Moore, W 2010, 'How do financial crises affect commercial bank liquidity?: Evidence from Latin America andthe Caribbean', MPRA Paper, No. 214.

Malik, M.F and Rafique, A 2013, „Commercial Banks Liquidity In Pakistan: Firm specific and Macroeconomic Factors", The Romanian economic Journal, No.48, pp. 144-146.

Muranaga, GF and Ohsawa, H 2002, Liquidity Risk and Performance in the Banking Sector, Finance Essay; available at: http://www.ukessays.com/.

Maina, H. (2011), Relationship between the liquidity and profitability of oil companies in Kenya, unpublished MBA Project, and University of Nairobi.

Rafique, A &Malik,M.F 2013, Commercial Banks Liquidity in Pakistan; Firm Specific & Macroeconomic factors,Romanian Economic Journal, pp. 139-154.

Rauch, C, Steffen, S, Hackethal, A and Tyrell, M 2008, 'Determinants of bank liquidity creation evidence fromsavings banks', Working Paper: Germen.

National Bank of Ethiopia, Directives No SBB/55/2013: Reserve Requirement (6th Replacement) National Bank of Ethiopia, Directives No SBB/57/2014: Liquidity Requirement.

National Bank of Ethiopia (2010): Bank Risk Management Guidelines.

NBE, Quarterly Bulletin First Quarter 2017/18Fiscal Year Series, VOLUME 34,NO1.

Shen, C, Chen Y, Kao, L &Yeh, C 2010, Bank Liquidity Risk and Performance; Available at:http://www.finance.nsysu.edu.tw/

Nadir, E. & İlhan, E. (2011). The 2008 global financial crisis and the liquidity management of the central bank of the republic of Turkey. InternationalJournal of Economics and Finance, 3(2), 186-193.

Nicola Limodio and Francesco Strobbe (September, 2017).Bank Deposits and Liquidity Regulation, Evidence from Ethiopia.

Subedi, S andNeupane, B 2011, Determinants of Banks' Liquidity and their Impact on Financial Performance;unpublishedMBA thesis Institute of Management, Pokhara University.

Valla, N, Saes-Escorbiac, B, and Tiesset,M 2006, 'Bank liquidity and financial stability', Financial StabilityReview,Banque de France, pp. 89-10.

Raja Almarzoqi, Sami Ben Naceur, and Alessandro D. Scopelliti(September, 2015).How Does Bank Competition Affect Solvency, Liquidity and Credit Risk? Evidence from the MENA Countries.

Patrick Boltony, Neng Wangz,& Jinqiang Yangx (February , 2015) .Theory of Liquidity and Risk Management Based on the Inalienability of Risky Human Capital .

Richard Dusansky1 & Çagatay Koç(November, 2012) . Liquidity Demand When the Opportunity Cost of Money is perceived Total Return.

Nicola Limodioy&Francesco Strobbe (June 2017) .Bank Deposits and Liquidity Regulation Evidence from Ethiopia.

Viral Acharya& Hassan Naqv (March, 2010). A Theory of Bank Liquidity and Risk-Taking over the Business Cycle.

Lee kar choon,lim young hooi,lingesh murthi,tan soon yi,& teoh yee shven (August,2013).the determinants influencing liquidity of Malaysia commercial banks, and its implication for relevant bodies: evidence from 15 Malaysia commercial banks.

(Vodová, P. 2011). Determinants of commercial bank's liquidity in Slovakia .Retrieved http://www.opf.slu.cz/kfi/icfb/proc2011/pdf/65_Vodova.pdf

Vodová, P. (2013). Determinants of commercial banks liquidity in Hungary. Retrieved from http://www.slu.cz/opf/cz/informace/acta-academicakarviniensia/

Vodová, P. (2012). Determinants of commercial banks' liquidity in Poland http://mme2012.opf.slu.cz/proceedings/pdf/165_Vodova.pdf

Lartey, V. C., Antwi, S. & Boadi, E. K. (2013). The relationship between liquidity and profitability of listed banks in Ghana. International Journal ofBusiness and Social Science, 4(3), 48-56.

Sharma, M. (2005). Problem of NPAs and its Impact on Strategic BankingVariables. Finance India, 19 (3), 953-967.

Painceira, J 2010, 'The Role of Banks in the Korean Financial Crisis of 1997: An Interpretation Based on the Financial Instability Hypothesis', research on money and finance, Department of Economics, School of Oriental and African Studies.

Pilbeam, K 2005, Finance and Financial markets, 2nd ed., Palgrave Macmillan: New York.

AppendixA: List of Sampled banks

NO	Name of Bank	Year of establishment
1	Awash	1994 G.C
2	Dashen	1995 G.C
3	Wegagen	1997 G.C
4	Abyssinia	1996 G.C
5	United	1998 G.C
6	NIB	1999 G.C

Source: NBE Website

Appendix B: Result of Hausman Tests (E-view)

Correlated Random Effects - Hausman Test
Equation: Untitled
Test period random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Period random	15.951922	4	0.0031

Appendix C: Result of Fixed Effects Regression Tests (E-view)

Dependent Variable: LQ
Method: Panel Least Squares
Date: 04/06/18 Time: 00:56
Sample (adjusted): 2002 2017
Periods included: 16
Cross-sections included: 6
Total panel (balanced) observations: 96

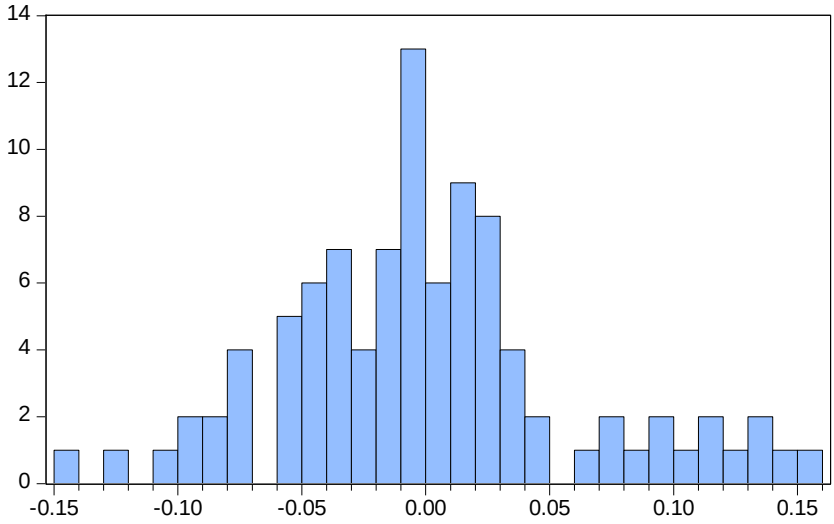
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.938884	0.411599	-4.710610	0.0000
GDP	0.080344	0.209883	0.382802	0.7028
UN	-11.46621	6.517897	1.759188	0.0822
NPL	-0.433962	0.106705	-4.066933	0.0001
MC	9.010384	1.375084	6.552608	0.0000
INDB	0.479684	0.125945	3.808664	0.0003
LQ(-1)	0.389052	0.081960	4.746854	0.0000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.701656	Mean dependent var	0.236175
Adjusted R-squared	0.662587	S.D. dependent var	0.108268
S.E. of regression	0.062890	Akaike info criterion	-2.578390
Sum squared resid	0.332233	Schwarz criterion	-2.257846
Log likelihood	135.7627	Hannan-Quinn criter.	-2.448821
F-statistic	17.95944	Durbin-Watson stat	1.896330
Prob(F-statistic)	0.000000		

Appendix D: Result of Normality test (E-view)



Series: Standardized Residuals
Sample 2002 2017
Observations 96

Mean	-2.35e-18
Median	-0.002271
Maximum	0.154650
Minimum	-0.147098
Std. Dev.	0.059137
Skewness	0.426665
Kurtosis	3.440177
Jarque-Bera	3.687708
Probability	0.158206

Appendix E: Result of Heteroskedasticity Test: White (E-view)

Heteroskedasticity Test: White

F-statistic	1.509937	Prob. F(27,73)	0.0848
Obs*R-squared	36.19284	Prob. Chi-Square(27)	0.1111
Scaled explained SS	46.87363	Prob. Chi-Square(27)	0.0102

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 11/25/11 Time: 01:04
Sample: 2 102
Included observations: 101

Variable	Coefficient	Std. Error	t-Statistic	Prob.

C	0.940293	1.875434	0.501373	0.6176
GDP^2	1.432699	3.022120	0.474071	0.6369
GDP*UN	-71.52303	90.02649	-0.794467	0.4295
GDP*NPL	0.136825	1.054257	0.129783	0.8971
GDP*MC	-0.715295	12.00948	-0.059561	0.9527
GDP*INDB	0.802295	0.869505	0.922704	0.3592
GDP*LQ(-1)	-0.196999	0.378038	-0.521109	0.6039
GDP	3.685105	3.779683	0.974977	0.3328
UN^2	-299.2202	371.4719	-0.805499	0.4231
UN*NPL	1.073608	7.287923	0.147313	0.8833
UN*MC	133.6471	259.9266	0.514172	0.6087
UN*INDB	-12.78155	10.19028	-1.254288	0.2137
UN*LQ(-1)	1.099486	8.159432	0.134750	0.8932
UN	13.42113	28.38671	0.472796	0.6378
NPL^2	-0.004696	0.155054	-0.030285	0.9759
NPL*MC	1.624716	3.460325	0.469527	0.6401
NPL*INDB	-0.134870	0.194747	-0.692541	0.4908
NPL*LQ(-1)	0.228937	0.148924	1.537274	0.1285
NPL	-0.423048	0.582792	-0.725898	0.4702
MC^2	18.23674	31.66467	0.575933	0.5664
MC*INDB	8.406785	1.997187	4.209313	0.0001
MC*LQ(-1)	-2.510779	2.444195	-1.027241	0.3077
MC	-14.62079	16.03253	-0.911946	0.3648
INDB^2	0.115424	0.154248	0.748299	0.4567
INDB*LQ(-1)	-0.207420	0.170684	-1.215226	0.2282
INDB	-0.863415	0.581019	-1.486036	0.1416
LQ(-1)^2	0.069569	0.069161	1.005910	0.3178
LQ(-1)	0.286723	0.646932	0.443204	0.6589

R-squared	0.358345	Mean dependent var	0.003615
Adjusted R-squared	0.121020	S.D. dependent var	0.006283
S.E. of regression	0.005890	Akaike info criterion	-7.201273
Sum squared resid	0.002533	Schwarz criterion	-6.476289
Log likelihood	391.6643	Hannan-Quinn criter.	-6.907779
F-statistic	1.509937	Durbin-Watson stat	2.132504
Prob(F-statistic)	0.084835		

Appendix F: Correlation between dependent variable and each independent variable

CORRELATION ANALYSIS

	LQ	GDP	UN	NPL	IBIR	MC
LQ	1					

GDP	-0.13873	1				
UN	0.063837	-0.12754	1			
NPL	0.139021	-0.09993	0.402625	1		
IBIR	0.440055	0.067426	-0.08104	0.078063	1	
MC	0.39513	-0.32635	0.613514	0.593223	-0.07489	1