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The Determinants of liquidity in Banking Business:

The case of selected Private Commercial Banks of Ethiopia

By

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Statement of Declaration

I, TigistAdenagir declare that this thesis entitled: Determinants of Liquidity in Banking Business: The case of selected private commercial Banks in Ethiopia and submitted in partial fulfillment of the requirements for the Degree of Master of Business Administration in finance, is outcome of my own effort & study and that all sources of materials used for the study have been duly acknowledged. I have produced it independently with only guidance and suggestion of the thesis Advisor. The study complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

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Abstract

Liquidity is one of the major concerns for banks and thus achieving the optimum level of liquidity is crucial. The main objective of this study was to identify the determinants of liquidity of private commercial banks in Ethiopia. In order to achieve the research objectives, data was collected from a sample of seven private commercial banks in Ethiopia over the period from 2008 to 2018. Bank specific and macroeconomic variables were analyzed by using the balanced panel fixed effect regression model. The findings of the study confirmed the lower capacity of private commercial banks to absorb liquidity shocks. The study also revealed that, Loan loss provision and Unemployment rate have positive and significant impact on liquidity and Bank size has negative and significant impact on liquidity; however, capital adequacy, Loan growth, Non-performing loan and real GDP growth rate have no statistically significant effect on the liquidity of Ethiopian private commercial banks. Thus, the study suggests that banks should ensure that they have sufficient capacity to absorb liquidity shocks by increasing their deposit through expanding their customer base and making the product accessible to customers. And also should pursue a balanced approach of their credit and liquidity management, which helps to manage their liquidity position.

Keywords: Determinants of Liquidity, Ethiopian Private Commercial Banks Balanced Panel Fixed Effect Regression Model

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Abbreviations and Acronyms

AIB	Awash International Bank
BOA	Bank of Abyssinia
Bsize	Bank size
CAP	Capital adequacy
CBO	Cooperative Bank of Oromiya
CC	Correlation Coefficient
CI	Condition index
CLRM	Classical linear regression model
CSA	Central statistics Agency
DB	Dashen Bank
GDP	Gross Domestic product
ILO	International Labour Organization
LG	Loan growth
LLP	Loan loss provision
LOLR	Lender of the last resort
NBE	National Bank of Ethiopia
NIB	Nib international Bank
NPL	Nonperforming loan
OECD	Organization for Economic cooperation and Development
OLS	Ordinary least square
UB	United Bank
UEP	Unemployment rate
VIF	Variance inflation factor
WB	Wegagen Bank

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CHAPTER ONE

1.0 INTRODUCTION

1.1 Back ground of the study

Banks play critical and dynamic role in the economic life of every modern state: They are important constituents of the money market and their demand deposits serve as money in the modern community. Banks can work as catalytic agents of growth by following the right kind of policies in their working, depending upon the socio-economic conditions prevailing in a country. It is realized that since banks have the required investment potentiality, they can make a significant contribution in eradicating poverty, unemployment, and they can bring about progressive reduction in inter regional, inter-state, and intersectional disparities through rapid growth of banking services.

Commercial banks have come to play a important role in the development of countries. The two basic functions of commercial banks are: mobilization of the savings of the persons and disbursement of credit according to socio - economic priorities, thus accelerating the pace of economic development in the desired direction.

Liquidity defines as the ability of bank to fund increases in assets and meet obligations as they come due, without incurring intolerable losses. Hence, liquidity risk arises from the essential role of banks in the maturity transformation of short-term deposits into long-term loans. Therefore, banks have to hold optimum level of liquidity that can maximize their profit and enable them to meet their obligation. Over the past years, the issue 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 converting maturities of balance sheet items. This process permits banks to hold illiquid monetary items for the non-bank public and give out liquid monetary items to both depositors and borrowers. The idea of bank liquidity is therefore an extension of the classic maturity transformation, as the bank creates liquidity on both sides of the balance sheet by offering access to long-term loans and contemporaneous access to short-term deposits (Bank for Inter Settlements/BIS, 2008). On the other hand, as was pointed out by (Diamond and Dybvig ,1983), one of the main reasons why banks are fragile, is their role in converting maturity and providing insurance as regards depositors potential liquidity needs.

Modern banking in Ethiopia was introduced in 1905. Banking is an extremely regulated industry in Ethiopia for a number of reasons. Some of the reasons include defending depositors' fund, ensuring safety and stability of the banking system, (that means to limit credit to a single borrower), and limiting or encouraging a particular kind of lending because of expected impact on the economy (NBE, 2008).

Following the enactment of the banking legislations in the country in the 1990s, a relatively good number of private banks have been established. For example, in the 2017/18 fiscal year the total number of banks already functioning in the country reached 18. Of these banks, sixteen are private and the other two are government owned.

According to the previous study (Wondimagegnehu, 2012), the distribution of commercial bank branches throughout the country indicated that one branch of a bank on the average is estimated to serve 95,124 people.

Table 1.1 List of private Banks in Ethiopia

No	Name of the Bank	Year of establishment
1	Awash International Bank	1994
2	Dashen Bank	1995
3	Abyssinia Bank	1996
4	Wegagen Bank	1997
5	United Bank	1998
6	Nib International Bank	1999
7	Cooperative Bank of Oromia	2004
8	Lion International Bank	2006
9	Oromia International Bank	2008
10	Zemen Bank	2008
11	Bunna International Bank	2009
12	Birhan International Bank	2009
13	Abay Bank	2010
14	Addis International Bank	2011
15	Debut Global Bank	2012
16	Enat Bank	2013

1.2 Statement of the problem

Liquidity of bank may be defined as the capability to meet anticipated and contingent cash needs. Cash needs arise from withdrawal of deposits, liability maturities and loan disbursements. Their requirement for cash is met by increase in deposits and borrowings, loan collections, investment maturities and the sale of assets. A minimum criterion of liquidity is the ability both to meet commitments when due and to undertake new transactions when desirable (Machairaju, 2008).

Insufficient liquidity can lead to unexpected cash shortfalls that must be covered at excessive cost which reduces profitability. It can lead to liquidity collapse of the bank without being capital insolvent. A bank has similarly to avoid excessive liquidity since it results in low asset yields and poor earnings (Machairaju, 2008).

The fundamental role of banks in the maturity transformation of short-term deposits into long-term loans makes banks inherently exposed to liquidity risk, both of an institution-specific nature and that which affects markets as a whole (Sundararajan&Balino, 2011). Liquidity creation itself is seen as the principal source of economic welfare contribution by banks but also as their primary source of risk (Nkusu, 2011). Therefore, virtually every financial transaction or commitment has consequences for banks liquidity. Liquidity risk has become one of the core concerns of financial institutions following the financial crisis of 2007 (Longworth 2010; Bernanke 2008). Liquidity and liquidity risk are very up to date and important topic. Liquidity risk is said to be killer of banks. This risk can unfavorably affect both bank's earnings and the capital. Therefore, it becomes the top priority of a bank's management to ensure the availability of adequate funds to meet future demands of providers and borrowers, at reasonable costs (Fiscal Policy Research Institute, 2011). Episodes of failure of many conventional banks from the past and the current provide the testimony to this claim. For instance, as United States/U.S. subprime mortgage crisis reached its peak in the years 2008/9 extraordinary levels of liquidity support were required from central banks in order to sustain the financial system (Kiyotaki& Moore, 2008). Even with such extensive support, many banks failed, were forced into mergers or required resolution. A decrease in funding liquidity then caused significant distress.

Banks dominate the financial sector in Ethiopia and as such the process of financial intermediation in the country depends deeply on banks. In fact the banking industry in Ethiopia is currently acts as the link that holds the country's economy together. Hence, keeping their optimal liquidity for banks in Ethiopia is important to meet the demand by their present and

potential customers. Researches made by (Worku, 2006) and (Semu 2010), indicated the presence of excess liquidity held by commercial banks in Ethiopia.

Depending on impacts that come from liquidity in the financial system in general and in banks in particular, the interest of researchers on studies of determinants of banks liquidity in Ethiopia is increased in the previous few years.

(Tseganesh, 2012), conducted on “Determinants of liquidity and therefore their impact on financial performance” and focused on studying factors affecting banks liquidity and the results of research revealed that. Real GDP rate and loan growth had statistically insignificant impact on banks liquidity. Capital adequacy, bank size, share of non-performing loans within the total volume of loans, charge per unit margin, rate of inflation and short-term charge per unit had positive and statistically significant impact on banks liquidity.

(Nigist, 2015), conducted on “Determinants of bank liquidity”, aimed to identify the determinants of commercial banks liquidity. And also, the result of the study revealed that capital adequacy, profitability, and real GDP growth rate have negative and statistically significant impacts on liquidity of Ethiopian commercial banks, whereas, bank size has positive and statistically significant impact on liquidity. Whereas nonperforming loan, loan growth, inflation rate, and interest rate margin were found to be statistically insignificant/ has no any impact on liquidity of Ethiopian commercial banks for the tested period.

(Belete, 2015) conducted on “Factors affecting liquidity “aimed to identify factors which affect the liquidity of commercial banks. The findings of the study revealed that capital strength, interest rate margin and inflation had statistically significant and positive relationship with banks’ liquidity. In contrast, loan growth had a negative and statistically significant relationship with banks’ liquidity. But, the relationship for profitability, non-performing loans, bank size and gross domestic product were found to be statistically insignificant.

For the knowledge of the researcher, all studies were conducted by examining determinants of liquidity of commercial banks in Ethiopia, including public banks. And those studies overlooked to examine the impact of Loan loss provision and unemployment rate on banks liquidity which are important variables that can significantly affect liquidity of the banking industry from the point of view of the theories and previous empirical studies. Thus, this study tried to investigate determinants of liquidity by adding the unexplored impact of these two variables specifically

incase of Ethiopian private commercial banks and will provide additional variables in the model that could help the banks and regulatory organs in developing their framework to proper management of their liquidity risk.

1.3 Objectives of the study

The levels of liquidity are the determinant factors that depict soundness and financial health of the banking sector. In view of the existing concern on holding optimal level of liquidity of private commercial banking sector in Ethiopia, it is found vital to undertake this study. Hence, the objectives of the study are stated below.

1.3.1 General Objectives

The main objective of the study was to analyze the determinant factors that affect the liquidity of private commercial bank in Ethiopia

1.3.2 Specific Objectives

To achieve the general objective, the following specific objectives are developed:

- To analyze the effect of Capital adequacy on banks liquidity.
- To analyze the effect of Non-performing loan ratio on banks liquidity.
- To analyze the effect of Bank size on banks liquidity.
- To analyze the effect of Loan growth on banks liquidity.
- To analyze the effect of Loan loss provision on banks liquidity.
- To analyze the effect of GDP growth rate on banks liquidity.
- To analyze the effect of unemployment rate on banks liquidity.

1.4 Hypotheses of the Study

According to the broad purpose statement the following hypotheses were formulated for investigation. Hypotheses of the study stands on the theories associated to a banks' liquidity that has been established over the years by banking area researchers and previous empirical studies related to a bank's liquidity. The results from the literature review (to be discussed in the next chapter) were used to establish expectations for the relationship of the different determinants. Hence, based on the objective, the present study tried to test the following hypotheses:

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

H2. Non-performing loan ratio has negative and significant effect on banks liquidity.

H3. Bank size has negative and significant effect on banks liquidity.

H4. Loan growth has negative and significant effect on banks liquidity.

H5. Loan loss provision has positive and significant effect on banks liquidity.

H6. GDP growth rate has a negative and significant effect on banks liquidity.

H7. Unemployment rate has negative and significant effect on liquidity.

1.5 Significance of the study

The study has great contribution to the existing knowledge in the area of factors determining banks liquidity in the context of private commercial banks in Ethiopia. This in turn contributes to the wellbeing of the financial division of the economy and the society as a whole. Therefore, the major beneficiaries from this study are each commercial bank, regulatory bodies, the academic staff of the country and the society as a whole in the country.

1.6 Organization of the study

This research is organized in five chapters. Chapter one provides the general introduction about the entire report. Chapter two describes the review of related literatures. Chapter three provides detail explanation of the methodology employed by the research. Chapter four covers data presentation, analysis and interpretation. Finally, the last chapter concludes the whole of the research and provides relevant recommendations based on the findings.

1.7 Scope of the study

The study focuses on factors determining commercial banks liquidity of private commercial banks in Ethiopia. Besides, the data used in the documentary study covered the period from 2008-2017 only for seven banks namely Awash international Bank, DashenBank, Abyssinia Bank, Wegagen Bank, United Bank, NIB international Bank, Cooperative Bank of Oromiya, Which were registered before 2007/08.

1.8 Limitation of the study

The researcher faced a problem with accessing financial data from National Bank of Ethiopia, because of lengthy process involved in obtaining information and financial statements and confidentiality of the nature of the required data. Another problem was time factor. That is the time provided was not enough since the researcher is equally an employee.

CHAPTER TWO

2.0 Literature Review

2.1 Theoretical Review of Commercial Banking

2.1.1 Commercial Banking

Commercial banks are financial institutions that collect deposits from the general public and extended loans to those in need of the money. Banks provide financial intermediation service for linking those who have surplus funds with those who are in need of funds, thus ensuring the money available in economy is always in proper place and use. In doing banks produce income when they lend money out at a higher interest rate than they pay depositors for use of their money. A Bank's main source of income is interest. A bank pays out at a lesser interest rate on deposits and receives a higher interest rate on loans and advances. The difference between these rates represents the bank's net interest income. Banks and other financial institutions exist in order to earn a profit and to guarantee the maximization of shareholder's value. (Van Gestel&Baesens, 2009).

Currently, in most jurisdictions commercial banks are regulated by government organization like, central banks and require a particular bank license to operate. The requirements for the provision of a bank license differ among jurisdictions but usually incorporate: Minimum capital, Minimum capital ratio, 'Fit and Proper' requirements for the bank's controllers, owners, directors, or senior officers, approval of the bank's business plan as being sufficiently prudent and reasonable. In the case of Ethiopia, the NBE authorized to give license for financial institutions and monitor their performance in line with the directives issued (NBE, 1994).

2.1.2 Role of Commercial Banks

Commercial banks are firms that provide a wide range of financial services and play an important role within the economy and the society as a whole in the economic resource allocation of countries. Their fundamental role is to make the community's surplus of deposits and investments useful by lending it to public for various investment purposes. Commercial banks' contribution to the economic growth lies in the role they play in mobilizing deposits and allocating the resources efficiently to the most productive uses in the real sector of the economy. (Rose, 2002), also considered commercial banks as the most important enabler of financial

transactions in any country's economy and the primary source of credit. As stated in (Saunders & Cornett, 2003), commercial banks extend credit to varied types of borrowers for many diverse purposes, either for personal, business or corporate clients.

Besides, banks also function as the custodians of nation's money that is accepted in the form of deposits and paid out on the client's orders (Sinkey, 2002; Harris, 2003). Banks also carry out other activities such as management of payment system, creation of indirect financial securities, information agency, supplying specific instruments to fill the gap as financial spectrum fillers, and dealing foreign currency (Fourie, et.al, 1998; Valdez, 2000).

Investment on a productive sector is the requirement for achieving the economic growth from a country perspective. Capital formation positively supports this investment function. Once adequate level of capital is formed, the option of sound investment comes, that ultimately leads to flow of capital in the future. Financial institutions, mainly banks do these functions through different means such as loans (Islaml, et.al., 2005). Lending presumes the fact that the borrower doesn't reimburse the first party immediately rather arranges either to pay back or return those resources at a later date, making it a debt.

To enable them function as financial intermediaries, banks gather funds from savers in the form of deposit and then supply it to borrowers as loans. Thus, banks accept customer deposits and use those funds to provide loans to other customers or invest in other assets that will yield a return higher than the amount banks pay the depositor (McCarthy et.al, 2010). Customers' deposit is the main source of bank loan and hence, increasing or guaranteeing deposits directly has a positive effect on lending. Commercial banks extend credit to their clients for many various purposes. This intermediation functions provide advantage both the banks and the borrowers.

In allocating funds, the primary objective of bank management is to earn income while serving the credit needs of its society (Reed and Gill, 1989). Lending represents the heart of the industry. The principal profit- making activity of commercial banks is making loans to their customers. Hence, loans and advances are the dominant asset and represent 50-75 % to total amount of assets at most banks which also produce the largest share of operating income and represent banks 'higher risk exposure (Mac Donald and Koch, 2006).

2.1.3 Banking Risks

Risk is the uncertainty or probability that a negative event happens. The core business of banking is to attract funds and to invest which is not without risk. According to (Van Gestel & Baesens,

2009), banks need to take risk to retain their margins and to fulfill their role in the economy. It is also believed that a bank that takes too much risk is likely to run into difficulty and may eventually fail its obligations and become insolvent.

Bank risk is mainly associated with financial risk related to potential losses of financial products. As (Van Gestel and Baesens, 2009) tried, banks face different elements of risks that are required to be identified, understood, measured and managed. The Basel II Capital Accord identifies three major sources of risk: credit risk, market risk and operational risk. These three types of risks are explicitly treated in the first pillar of the Basel II Capital Accord. Banks are also exposed to sources of risk other than credit, market and operational risk as pillar 2 in the Basel II Capital Accord also demands that banks have adequate capital to cover all types of risk, without making explicit which types of risk these can be. Other types of risk incorporate Liquidity risk, interest rate risk, reputation risk and business risk.

2.2 Bank Liquidity

Bank liquidity is capability to fulfill customers demand and provide advances in the forms of loans and overdrafts. Liquidity is also banks' cash and cash equivalent for example, commercial paper, treasury bills, etc. (Anyanwu, 1993), understands liquidity as assets readily convertible to cash without loss and ability to pay depositors on demand.

(Golin, 2001) and (Yuqi, 2008), defines that liquidity is a risk having insufficient current assets to satisfy current obligations of depositors especially during the time of economic stress. Therefore, without adequate liquidity and funding to meet obligations, a bank may fail. (Pandey, 2010) states that liquidity is current assets which should be managed efficiently to defend the firm against the risk of illiquid. Lack of liquidity in extreme situations can lead to the firm's bankruptcy. He also state that conflict exists among liquidity and profitability. If the firm does not invest sufficient fund in current assets, it may turn out to be illiquid which is risky. It may lose profitability if some unused current assets do not earn anything. Hence, insufficient liquidity is one of the main reasons of bank failure. Liquidity is necessary to enable banks providing funds on demand and credits needed by customers which are related with the default risk.

2.3 Quantitative framework for measuring liquidity risk

A financial institution can use a number of sources to meet its liquidity needs; these include new deposits, maturing assets, borrowed funds and/or using the discount window (borrowing from the central bank). Given that access to these measurement and management is an essential activity in

most commercial banks. Before going to see the methods for measuring liquidity risk, sources of liquidity risk and possible ways to alleviate them should be clearly stated. (Rochet,2008), states three main sources of liquidity risk: on the liability side, there is a large insecurity on the volume of withdrawals of deposits or the renewal of rolled-over inter-bank loans, particularly when the bank is under suspicion of insolvency or when there is an aggregate liquidity shortage, on the asset side, there is an uncertainty on the volume of new loan requests that a bank will receive in the future, and off-balance sheet operations, like credit lines and other commitments, positions taken by banks on derivative markets.

According to (Aspach et. al. 2005), there are some methods that banks can use to assure against liquidity crises: primarily, banks hold buffer of liquid assets on the asset side of the balance sheet. A large enough buffer of assets such as cash, balances with central banks and other banks, debt securities issued by governments and similar securities or reverse repo trades minimize the likelihood that liquidity demands threaten the viability of the bank. Second strategy is linked with the liability side of the balance sheet. Banks can depend on the interbank market where they borrow from other banks in case of liquidity demand. However, this approach is strongly connected with market liquidity risk. The last strategy also concerns about the liability side of the balance sheet. The central bank typically acts as a Lender of Last Resort to provide emergency liquidity support to particular illiquid institutions and to provide aggregate liquidity support in case of a system-wide shortage.

Liquidity risk of banks can be measured by liquidity gap/flow approach or liquidity ratio/stock approach. The liquidity gap is the difference among assets and liabilities at both present and future dates. At any date, a positive gap between assets and liabilities is equal to a deficit that has to be filled (Bessis, 2009). Liquidity ratios are various balance sheet ratios which must identify main liquidity trends. These ratios reflect the fact that bank should be certain that appropriate, low-cost funding is available in a short time. This might involve holding a portfolio of assets than can be simply sold (cash reserves, minimum required reserves or government securities), holding significant volumes of stable liabilities (especially deposits from retail depositors) or maintaining credit relationships with other financial institutions. Various authors such as,(Moore,2010), (Rychtárik,2009), or (Praet and Herzberg,2008) provided various liquidity ratios such as liquid assets to total assets ratio, liquid assets to deposits and short-term financing, loans to total assets and loans to deposits and short-term borrowings. To summarize, the stock

approach employs different balance sheet ratios to identify liquidity trends. The flow approach, in contrast, treats liquid reserves as a reservoir: the bank assesses its liquidity risk by comparing the variability in inflows and outflows to decide the amount of reserves that are needed during a period. Even though, both approaches are intuitively appealing, the flow approach is more data intensive and there is no standard technique to anticipate inflows and outflows. As a result, the stock approaches are more popular in practice and in the academic literature (Crosse and Hempel, 1980; Yeager and Seitz, 1989; Hempel et al. 1994; Vodova 2011).

Hence, to meet the objective of this research the liquidity ratio/stock approach was selected. The researcher selects to utilize the liquid asset to total deposit ratio because the liquidity framework of NBE is favorable towards liquid asset to total deposit ratio.

2.4 Determinants of commercial banks liquidity

2.4.1 Bank specific factors

Capital adequacy

Banks capital has defined as common stock plus surplus plus undivided profits plus reserves for contingencies and other capital reserves (Patheja, 1994). In addition, since a bank's loan-loss reserves also helps as a buffer for absorbing losses, a broader meaning of bank capital includes this account. Opposing to the standard view of liquidity creation in which banks create liquidity by converting liquid liabilities into illiquid assets, the recent theories show the creation of liquidity by changing asset mixes. (Diamond and Rajan, 2000, 2001) and (Gorton and Winton, 2000), stated that banks can make more or less liquidity by simply changing their funding mix on the liability side. (Thakor, 1996), explains that capital may also affect banks' asset portfolio composition, thereby affecting liquidity creation through a change in the asset mix.

The theoretical literature provides two opposing views on the relationship between bank capital and liquidity creation. Under the first view, bank capital tends to obstruct liquidity creation through two distinct effects: the financial fragility structure and the crowding-out of deposits hypothesis. Certainly, financial fragility structure characterizes by lower capital, tends to favor liquidity creation (Diamond and Rajan, 2000, 2001), while higher capital ratios may crowd out deposits and thereby weaken liquidity creation (Gorton and Winton, 2000). Roughly explained, the financial fragility structure effect is the outcome of the following process.

The bank gathers funds from depositors and lends them to borrowers. By monitoring borrowers, the banks get private information that gives it an advantage in assessing the profitability of its borrowers. However, this informational advantage creates an agency problem and the bank may extort rents from its depositors by requiring a larger share of the loan income. If depositors refuse to pay the required higher cost, the bank withholds monitoring efforts or loan collecting efforts. As depositors know that the bank may misuse their trust, they become reluctant to deposit their money in the bank. Consequently, the bank has to win depositors' confidence by adopting a fragile financial structure with a huge share of liquid deposits. A contract with depositors mitigates the bank's hold-up problem because depositors can run on the bank if the bank threatens to withhold efforts. Thus, financial fragility favors liquidity creation since it allows the bank to gather more deposits and award more loans. By contrast, higher capital tends to mitigate the financial fragility and improves the bargaining power of the bank that leads to hamper the credibility of its commitment to depositors. Thus, higher capital tends to reduce liquidity creation.

Besides, (Gorton and Winton, 2000), shows that a higher capital ratio could decrease liquidity formation through another effect: the crowding out of deposits. They consider that deposits are more effective liquidity hedges for agents than investments in bank equity. Certainly, deposits are fully or partially insured and withdraw able at par value. By contrast, bank capital is not entitled and with a stochastic value that depends on the state of bank fundamentals and on the liquidity of the stock exchange. Thus, higher capital ratios swing investors' funds from liquid deposits to illiquid bank capital. Thus the higher is the bank's capital ratio; the lower is its liquidity creation.

Under the alternative "risk absorption" hypothesis, which is directly linked to the risk-transformation role of banks, higher capital enhances the ability of banks to make liquidity. Liquidity creation increases the bank's exposure to risk as its losses increase with the level of illiquid assets to satisfy the liquidity demands of customers (Allen and Gale, 2004). The more liquidity that is created, the greater is the probability and severity of losses related with having to dispose of illiquid assets to meet the liquidity demands of customers. Bank capital lets the bank to absorb higher risk (Repullo, 2004). Thus, under the second view, the higher is the bank's capital ratio, the higher is its liquidity creation.

Non-performing loans

Non-performing loans (NPLs) are loans that a bank customer fails to meet his/her contractual obligations on principal or interest payments exceeding 90 days (NBE, 2008). NPLs are loans which provide negative impact to banks in developing the economy. Growth of non-performing loan portfolios significantly contributed to financial distress in the banking sector.

A definite fact, financial systems are accountable for managing complex and advance financial transactions. The banking systems play the fundamental role of mobilizing and allocating resources in the market, conduit for savings and surplus funds channeled to deficit units. Financial institutions manage that processes are being run effectively and efficiently. The financial word for this activity is called “Risk Transformation”. That is to mean converting riskless deposit to risky loans. Granting loans produce most profits for banks. But it involves high risk and eventually the main contributor to non-performing loans (NPLs).

The increased non-performing loan reveals deteriorated asset quality, credit risk and its inefficiency in the allocation of resources. According to (Bloem and Gorter, 2001), though non-performing loans may affect all sectors, the most serious impact is on financial institutions which tend to have big loan portfolios. On the other hand, large volume of nonperforming loans portfolio will affect the capability of banks to provide credit and leads to loss of confidence and liquidity problems. Therefore, the amount of non-performing loans has a negative impact on bank’s liquidity.

Bank Size

The bank's total asset is another bank specific variable that affects the liquidity of banks. Bank size measures its general capacity to assume its intermediary function. There are two opposing arguments regarding to the relationship among bank liquidity and bank size. The first view is the “too big to fail” hypothesis which considers negative relationship between bank size and liquidity whereas; the second view considers there is a positive relationship between bank size and liquidity. According to the “too big to fail” argument, large banks would benefit from an implicit guarantee, thus reduce their cost of funding and allows them to invest in riskier assets (Iannotta,et al. 2007). Therefore, “too big to fail” status of large banks could lead to moral hazard behavior and too much risk exposure. If big banks are considered themselves as “too big to fail”, their motivation to hold liquid assets will be limited. In case of a liquidity shortage, they depend on a liquidity assistance of Lender of Last Resort. Therefore, Bank size has negative impact of bank on banks liquidity.

Loan growth

(Comptroller's Handbook, 1998), states that lending is the principal business activity for majority of commercial banks. The loan portfolio is typically the major asset and the predominate source of revenue. As such, it is one of the major sources of risk to a bank's safety and soundness. Since loans are illiquid assets, increase in the amount of loans results in increase in illiquid assets in the asset portfolio of a bank. According to (Pilbeam, 2005) in practice, the amount of liquidity held by banks is seriously suffering from loan demand that's the bottom for loan growth. If demand for loans is weak, then the bank tends to hold much liquid assets (i.e. short-term assets), whereas if demand for loans is strong, they tend to hold less liquid assets since long term loans are generally more profitable. Therefore, loan growth has negative impact on banks liquidity.

Loan Loss provision

According to (Hasan&Wall, 2004) where provisions are caused by default incidents on loans, higher levels of nonperforming loans are related with high rates of pro- visioning. At the same time, banks predicting high levels of capital losses might generate higher provisions to decrease earnings volatility and to reinforce medium term bank solvency. The willingness of a bank to provision for loan losses is considered as a strong belief in the future performance of the bank (Ahmad et al. 1999). The overall rate of provisioning reflects the attitude of the banking system toward risk.

According to (Berrospide, 2012) Banks held more liquid assets in response to increased risks in their asset portfolios. Additionally, to unrealized securities losses, a measure of expected loan losses like, loan loss reserves is also a key driver of liquidity. Intuitively, up on the financial crisis, and most likely due to increasing worries about the economic outlook, heightened uncertainty about the credit quality of borrowers may have forced banks to reallocate their assets from riskier loans to safe and liquid securities. Unlike traditional measures of credit quality, like, net charge-offs and delinquent loans, loan loss reserves have a forward-looking component that reflects banks' efforts to increase their loan provisioning in anticipation of expected losses, and therefore, provide another motivation to hoard cash in anticipation of such losses. Therefore, Loan loss provision has a positive impact on bank's liquidity.

2.4.2 Macro economic factors

GDP growth rate

Macroeconomic perspective is probably affect bank activities and investment decisions as the profile of bank liquidity (Pana et al. 2009 and Shen et al. 2010). For instance, the demand for various financial products is higher during economic boom and may advance bank ability to expand its loan and securities portfolios at a higher rate. Similarly, economic downturns are exacerbated by the reduction in bank credit supply. Based on these , we can expect banks to increase their transformation activities and their illiquidity during economic booms.

In accordance with the theory of bank liquidity and financial fragility, the connection 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). As in (Pilbeam, 2005) in line with the above argument the “loan able fund theory of interest” states that the availability for loan (i.e. illiquid assets for banks) increases when the economy is at boom or going out of recession.

(Aspachs et al. ,2005) indicated that banks hoard liquidity during periods of economic downturn, when lending opportunities may not be as good and they run down liquidity buffers during economic expansions when lending opportunities may have picked up. Thus, it can be expected that higher economic growth make banks run down their liquidity buffer and induce banks to lend more.

(Bordo et al. 2001) suggest two explanations on the causes of liquidity runs on deposit money banks. They explained that, runs on banks are a function of mass psychology or panic, such that if there is an expectation of financial crisis and people take panic actions in anticipation of the crisis, the financial crisis becomes inevitable. (Bordo et al. ,2001) also “asserts that crises are an intrinsic part of the business cycle and result from shocks to economic fundamentals.

When the economy goes into a recession or depression, asset returns are expected to fall. Borrowers will have difficulty repaying loans and depositors, anticipating an increase in defaults or nonperforming loans, will try to protect their wealth by withdrawing bank deposits. Banks are caught between the illiquidity of their assets (loans) and the liquidity of their liabilities (deposits) and may become insolvent. Therefore, GDP growth rate has Negative impact on banks liquidity.

Unemployment Rate

According to (ILO, 2013), the standard definition of unemployment refers to “all those persons of working age who do not have work, looking for work (carried out activities to seek employment during a recent period comprising the last four weeks or one month), and currently available for work”. Furthermore, future starters of work are regarded as unemployed. The long-term unemployment can be defined as those people with duration of search for employment a period of lasting 12 months or more, including the reference period.

An increase in the unemployment rate can be associated with an increase in non-performing loans and thus lowering bank liquidity (Trenca et al. 2015). According to (Hackethal, et al. 2010), unemployment shows deterioration in general economic conditions, which is necessarily reflected in the lower availability of liquidity, etc. Higher unemployment may also lead to the loss of revenue of clients who are repaying previously obtained loans. This puts pressure on banks to cover these shortfalls. The study by (Vodova, 2012) also supports the aforementioned issues by found out bank liquidity decreases with the higher unemployment rate.

Therefore, Unemployment rate has negative impact on banks liquidity.

2.5 Review of related empirical studies

2.5.1 Related empirical evidence on worldwide base

(Vodová 2012) studied to identify determinants of liquidity of commercial banks in Slovakia. To meet its objective, the researcher considered both the firm specific and macro-economic data over the period from 2001 to 2009. The data was analyzed with panel data regression analysis by using an econometric package Eviews7. The result of the study showed that; bank liquidity decreases mostly as a result of financial crisis, higher bank profitability, higher capital adequacy and with the size of banks while liquidity measured by lending activity of banks increases with the growth of gross domestic product and decreases with the higher unemployment. Key interest

rate, interest rate margin, rate of inflation, and non-performing loans have no statistically significant impact of the liquidity of Slovak commercial banks.

(Malik and Rafique, 2013) examined bank specific and macroeconomic determinants of commercial banks' liquidity in Pakistan. Their study sample consist 26 Pakistani commercial banks for the period 2007 to 2011, which also covers the Asian financial crisis of 2008. The study measured in two ways; one is cash and cash equivalents to total assets (L1) and second is advances net of provisions to total assets (L2). Two models are assessed based on these measures of liquidity. The results of model L1 showed that the bank specific variables (NPL and TOA) and monetary policy interest rate positively influence the bank liquidity whereas inflation has a negative impact. Bank liquidity which is measured by L1 is negatively and significantly affected by the financial crisis. The results of model L2 show that the bank size and monetary policy interest rate positively and significantly determined the bank liquidity.

The study made by (Subedi and Neupane, 2011) on determinants of banks' Liquidity and their impact on financial Performance in Nepalese commercial Banks. They used multivariate linear regression model to include Liquid Assets to Total Assets Ratio, Loan to Deposit & Short Term Financing and Return on Assets for the data of six commercial banks in the sample covering the period from 2002 up to 2011/12. The results of regression analysis indicated that capital adequacy; non-performing loans had negative and statistically significant impact on banks liquidity. However, loan growth, liquidity premium paid by borrowers and short-term interest rate had negative and statistically insignificant impact on banks liquidity. Bank size had positive and significant impact on banks liquidity.

(Vodova ,2011) aimed to identify important factors affecting commercial banks liquidity of Czech Republic. In order to meet his objective the researcher analyzed bank specific and macroeconomic data over the period from 2001 to 2009 and analyzed them with panel data regression analysis by using E views 7 software package. The study considered four banks specific and eight macroeconomic independent variables which affect liquidity of banks. The predicted impact of the independent variables on bank liquidity were: capital adequacy, inflation rate and interest rate on interbank transaction/money market interest rate were positive and for the share of non-performing loans on total volume of loans, bank profitability, GDP growth, interest rate on loans, interest rate margin, monetary policy interest rate/repo rate, unemployment rate and dummy variable of financial crisis for the year 2009 were negative whereas, the

expected sign for bank size was ambiguous (+/-). The dependent variable (i.e. liquidity of commercial banks) was measured by using four liquidity ratios such as liquid asset to total assets, liquid assets to total deposits and borrowings, loan to total assets and loan to deposits and short term financing. The study by (Vodova,2011) revealed that bank liquidity was positively related to capital adequacy, interest rates on loans, share of non-performing loans and interest rate on interbank transaction. In contrast, financial crisis, higher inflation rate and GDP have negative impact on bank liquidity. The relation between the size of the bank and its liquidity was ambiguous as it was expected. The study also found that unemployment, interest margin, bank profitability and monetary policy interest rate/repo rate have no statistically significant effect on the liquidity of Czech commercial banks.

2.5.2 Related empirical evidence in Africa

(Chagwiza, 2011), made study on banks liquidity and its determinants in commercial banks in Zimbabwe. The main objective of his study was to identify the determining factors of liquidity in Zimbabwean commercial banks using data from January 2010 to December 2011 and the regression analysis was used. The result of his study revealed that, there was a positive relationship between bank liquidity and capital adequacy, total asset(TOA), Gross domestic product, and bank rate, while there was negative relationship with macro-economic factors; adoption of multiple-currency, inflation rate, and business cycle.

(Laurine, 2013) again studied regarding Zimbabwean Commercial Banks Liquidity Risk Determinants after Dollarization. The aim of his paper was that empirically investigating the determinants of Zimbabwean commercial banks liquidity risk after the country adopted the use of multiple currencies exchange rate system and to meet his objective panel data regression analysis was used on monthly data from the period of March 2009 to December 2012. The result of the study revealed that capital adequacy and size have negative and significant influence on liquidity risk. Whereas, spread; non-performing loans have a positive and significant relationship with liquidity risk. Reserve requirement ratios and inflation were also significant in explaining liquidity during the studied period.

And also empirical study made by (Fadare ,2011), on the banking sector liquidity and financial crisis in Nigeria with the objective of identifying the key determinants of banking liquidity in Nigeria, and assessing the relationship between determinants of banking liquidity and financial frictions within the economy. It was employed a linear least square model and time series data

from 1980 to 2009. The study found that only liquidity ratio, monetary policy rate and lagged loan to deposit ratio were significant for predicting banking sector liquidity. Secondly, it showed that a decrease in monetary policy rate, liquidity ratios, volatility of output in relation to trend output, and the demand for cash, leads to an increase in current loan to deposit ratios; while a decrease in currency in circulation in proportion to banking sector deposits; and lagged loan to deposit ratios leads to a decrease in current loan to deposit ratios. Generally, the result suggested that during periods of economic or financial crises, deposit money banks were significantly illiquid relative to benchmarks, and getting liquidity monetary policies right during these periods is crucial in ensuring the survival of the banking sector.

2.5.3 Related empirical evidence in Ethiopia

The study made by (Tseganesh ,2012) aimed to identify the determinants of banks liquidity and their impact of financial performance on commercial banks in Ethiopia. The study was concerned with two points; identify determinants of commercial banks liquidity in Ethiopia and see the impact of banks liquidity up on financial performance through the significant variables explaining liquidity. The data was analyzed by using balanced fixed effect panel regression model for eight commercial banks in the sample covered the period from 2000 to 2011 and the result of her study indicate that capital adequacy, bank size, share of nonperforming loans in the total volume of loans, had positive and statistically significant impact on banks liquidity whereas loan growth had statistically insignificant impact on banks liquidity.

The study by (Nigist,2015), intended to identify the determinants of commercial banks. The data covered the year from 2007-2013 for the sample of 10 commercial banks in Ethiopia and used only secondary data. Both bank specific and macroeconomic variables were analyzed by the balanced panel fixed effect regression model and the result of the study revealed that capital adequacy, profitability, and real GDP growth rate have negative and statistically significant impacts on liquidity of Ethiopian commercial banks while bank size has positive and statistically significant impact on liquidity. Whereas nonperforming loan, loan growth, inflation rate, and interest rate margin were found to be statistically insignificant/ has no any impact on liquidity of Ethiopian commercial banks for the tested period.

The study by (Belete, 2015) aimed to identify the bank-specific and macro-economic factors affecting bank liquidity for eight commercial banks in Ethiopia, for the period of 2002-2013 by using balanced fixed effect panel regression. The study adopts a mixed methods research

approach by combining documentary analysis and in-depth interviews. The findings of the study showed that capital strength, interest rate margin and inflation had statistically significant and positive relationship with banks' liquidity. Conversely; loan growth had a negative and statistically significant relationship with banks' liquidity. On the other hand, the relationship for profitability, non-performing loans, bank size and gross domestic product were found to be statistically insignificant.

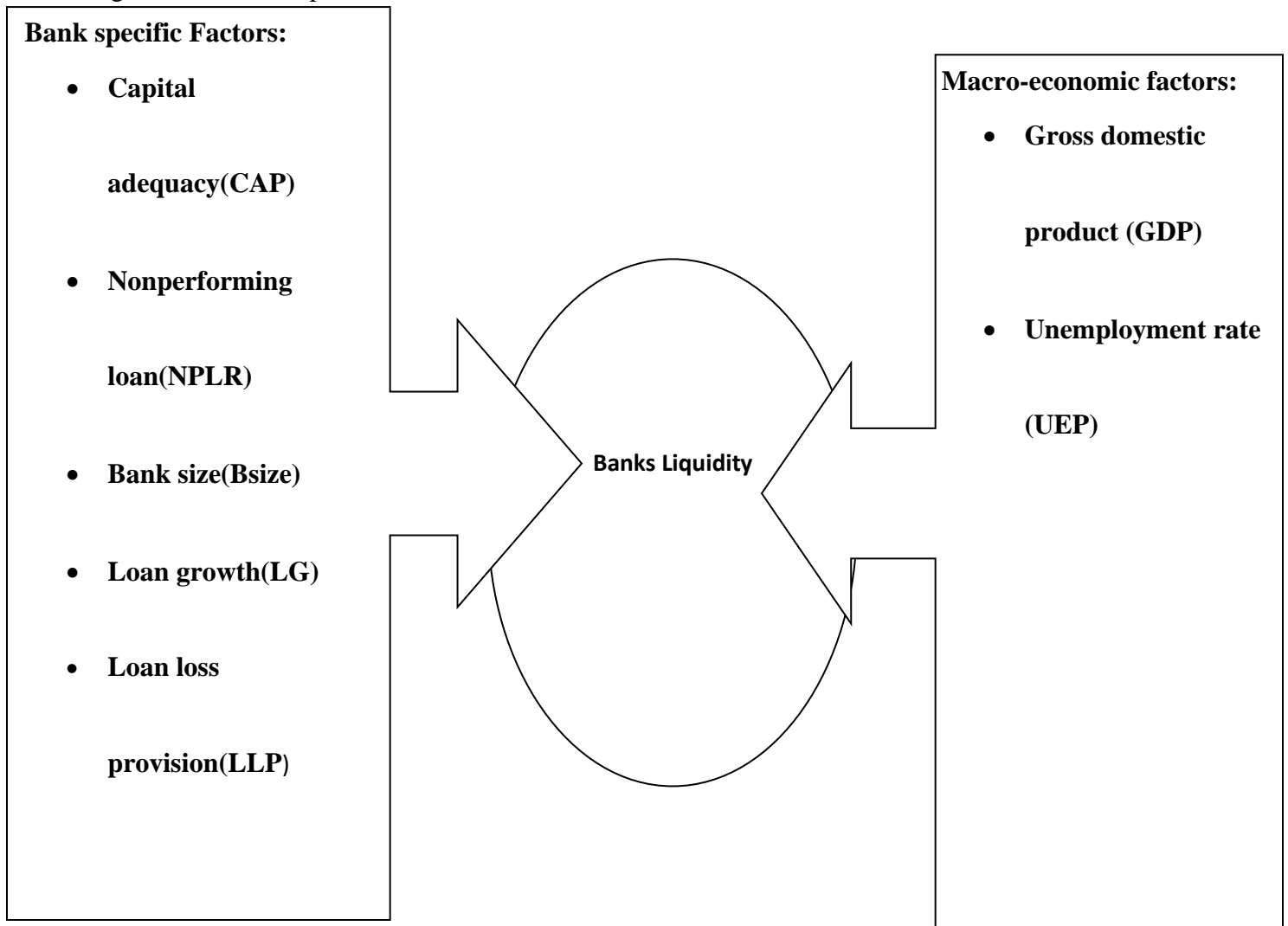
2.6 Research gap

The principal role of banks in the maturity transformation of short-term deposits into long-term loans makes banks inherently exposed to liquidity risk both of an institution-specific nature and that which affects the whole market. Virtually every financial transactions or commitments have implications for a bank's liquidity. Effective liquidity risk management helps to guarantee a bank's ability to meet cash flow obligations, which are uncertain as they are affected by external factors and other agents' behavior. Financial market developments in the previous years have increased the complexity of liquidity risk and its management. The global market turmoil that began in mid-2007 re-stressed the necessity of liquidity to the functioning of financial markets and the banking sector. The financial crisis illustrated how rapidly liquidity can evaporate and that illiquidity can stay for an extended period of time. The banking system came across severe stress, which required central bank action to help both the functioning of money markets and, in a few cases, individual institutions. As it was discussed in the literature review part, liquidity of banks can be affected by bank specific as well as macroeconomic factors. It was also discussed that some factors which have significant impact on liquidity of banks in one country may not have the same impact on another country. Thus it is important to identify the determinants of liquidity of Ethiopian private commercial banks. For the knowledge of the researcher, all studies conducted in Ethiopia focused on determinants of liquidity in overall banking industry of Ethiopia including public banks and those studies disregarded the impact of some variables (Loan loss Provision and unemployment rate) which can significantly affect liquidity of the banking industry from the point of view of the theories and previous empirical studies. Hence this study aimed to identify the determinants of liquidity in private commercial banks of Ethiopia by adding two more previously unexplored variables.

2.7. Conceptual Framework

The conceptual frame work which describes the relationship between bank liquidity with bank specific and macroeconomic determinants based on the theoretical and empirical perspectives was formulated as follows and the variables have been selected based on prior studies and professional judgment of the researcher.

Figure1: The Conceptual frame work



Source: Self extracted

Chapter three

3. Research methodology

3.1 Introduction

Research methodology deals with the various consecutive steps to be adopted by a researcher in studying a problem with a definite objective in view. This chapter emphasizes the methodology which was applied in data collection, analysis and presentation. It also deeply depicts the research design, target population, sampling design, data collection and data analysis techniques.

3.2 Research Design

According to (Sekaran, 2003), a research design is set up to decide on, amongst other issues, how to gather additional data, analyze and interpret them, and to provide solutions to the problems.

A research design is also defined as the plan and structure of examination and the way in which studies are put together (Kotzar et al., 2005). It is an blueprint for conducting a research. It details the procedures necessary for obtaining the information required to structure the research problem.

A research methodology is a means to take out the meaning of data (Leedy and Ormrod, 2005). As data and methodology are very mutually dependent, the methodology to be applied for a particular research problem must always consider the nature of data that will be gathered to resolve the research problem.

According to (Creswell,2009), there are three fundamental world views that are considered to be base for the quantitative, qualitative and mixed research approaches that are post-positivist, social constructivist and participative, and pragmatic respectively.

Quantitative methods approach was employed to meet the overall objective of the study and to test hypotheses under it. According to (Loose, 1993), a quantitative (deductive) research entails the development of a conceptual and theoretical structure before it's testing through empirical observation. Deductive or quantitative research conventionally starts by analyzing the literature to identify a single chosen problem/knowledge gap leading to the isolation of the major research question(s) in which the existing knowledge

may be insufficient (could be identified gaps between existing theories or evidence, contradictions to be explored, or new contexts for applying previous findings) (Sutrisna,2009).

The aim of quantitative studies is supporting the researcher to project his or her findings on to the larger population through an objective process. Data collected, often through surveys administered to a sample or subset of the whole population, allow the researcher to generalize or make inferences. The obtained results are interpreted to decide the probability that the conclusions found among the sample can be replicated within the larger population.

Conclusions are created from data collected and measures of statistical analysis (Creswell 2002; Thorne and Giesen,2002). Therefore, the researcher is capable of studying a phenomenon without influencing it or being influenced by it; “inquiry takes place as through a one way mirror” (Guba and Lincoln, 1994). The aim is to measure and analyze causal relationships among variables within a value-free framework (Guba and Lincoln, 1994).

Therefore, for this study quantitative research approach is used to see the relationship between the liquidity of private commercial banks and the bank specific and macroeconomic factors affecting banks liquidity in Ethiopia by establishing causal relationship. This study also adopted an explanatory approach by using balanced panel research design to meet the research objective. As explained by (Bhattacharjee,2012), explanatory research tries to identify causal factors and results of the target phenomenon. According to (Brooks, 2008), a panel of data will embody information across both time and space and it measures some quantity about them over time. The advantage of using panel data is to address a broader range of issues and tackle more difficult problems than would be possible with pure time-series or pure cross-sectional data alone. Panel data has also the advantage of providing more informative data as it consists of both the cross sectional information, which captures individual variability, and the time series information, which captures dynamic adjustment (Brooks, 2008).

3.3 Population and sampling technique

Population of the study: For this research, the target population is all private commercial banks registered by the National Bank of Ethiopia (NBE) and found in operation. Currently, there are sixteen private commercial banks in the Ethiopian banking industry.

Sampling frame: The frame for drawing sample included those private commercial banks having at least ten years working experience in Ethiopia (i.e. from 2008 to 2018). In Ethiopia there are ten private commercial banks having ten years experience which include Awash International Bank, DashenBank, AbyssiniaBank, WegagenBank, UnitedBank, Nib international bank, Cooperative bank of oromiya, Lion international Bank, Oromia international Bank and Zemen Bank.

Sample: The sampling technique used under this study was non random purposive or judgmental sampling. In this type of sampling, items for the samples are selected deliberately. In other words, under purposive or judgmental sampling the organizers of the inquiry purposively choose the particular units of the universe for constituting a sample on the basis that the small mass that they so select out of a huge one will be typical or representative of the whole (Kothari 2004). This enables to select samples which are appropriate to achieve the study objective. Hence, seven private commercial banks having ten and above experience (i.e from 2008- 2018) in the industry is selected for this study and the data to be collected is uninterrupted for ten consecutive years. Therefore, it was possible to draw a relationship among variables using 70 observations; across seven banks over ten years (i.e. the matrix for the frame was 7×10 that included 70 observations).

3.4. Description and measurement of analysis

3.4.1 Dependent variable

Liquidity of banks: liquidity is the capacity of banks to fund increases in assets and decrease in liability without affecting their daily operation or incurrance of undesirable losses (Bank for International Settlements/BIS, 2008). Generally, there are two methods of measuring liquidity of banks which are liquidity ratios and funding gap. The first approach is easy to compute since it uses different balance sheet ratios. Whereas, the second approach funding gap is the difference between

inflows and outflows which is difficult to measure because it is more data intensive and there is no standard technique to predict inflows and outflows(Laurine 2013). For this study the researcher intended to use liquidity ratios due to the easiness and availability of data to measure banks liquidity. The following ratios will be used:

Liquid assets to total deposit ratio (L1)

Liquidity ratio L1 measures the liquidity of a bank assuming that the bank cannot borrow from other banks in case there is a liquidity problem. This is relatively strict measure of liquidity but it enables the researcher to capture at least the part of the market liquidity risk. This makes certain whether the bank's short-term assets are readily available to pay off its short-term liabilities. The bank is able to meet its obligations in terms of funding (the volume of liquid assets is high enough to cover volatile funding) if the value of this ratio is 100% or more (Vodova, 2013). Lower value indicates a bank's increased sensitivity in connection with deposit withdrawals. This enables the researcher to capture the bank's vulnerability related to these funding sources. The higher is the value of the ratio, the higher is the capacity to absorb liquidity shock (the bank is in a better position to meet its stochastic withdrawals).

As per NBE's last replaced liquidity requirement directives No. SBB/57/2014, "liquid assets" incorporates cash, deposits with the National Bank and other local and foreign banks having acceptance by the National Bank, other assets easily convertible into cash expressed and payable in Birr or foreign currency having acceptance by the National Bank, deposits held in Organization for Economic Cooperation and Development (OECD) member countries 'currencies and payable by banks of OECD member countries and in such other currencies as may be approved by the National Bank as well as securities issued by OECD member countries denominated in currencies of such countries and such other assets as the National Bank may from time to time declare to be liquid assets. For the purpose of this research, the liquid assets include cash on hand (local and foreign), cash at bank, deposits with the National Bank Ethiopia and other local and foreign banks having acceptance by the National Bank and treasury bills.

$$L1 = \frac{\text{Liquid assets}}{\text{Total deposits}}$$

Total deposits

Liquid asset includes cash on hand (local and foreign), cash at bank, deposits with the National Bank Ethiopia and other local and foreign banks having acceptance by the National Bank and

treasury bills. On the other hand, the amount of total deposits is the sum of demand, saving and fixed deposits of banks.

3.4.2 Independent Variables

Capital Adequacy of Banks (CAP):

Capital adequacy implies the adequate funds to absorb losses to safeguard depositors, creditors, and official institutions in the interest of maintaining banking system stability. It incorporates common stocks, surplus funds, undivided profit, reserve for contingencies and other capital reserves ((Patheja, 1994). Higher capital requirements provide higher liquidity to financial institutions. Where risk absorption theory is realized that “Higher capital improves the ability of banks to create liquidity.”

In the recent empirical studies mostly found that bank capital increases bank liquidity through its ability to absorb risk and also agree that a positive and significant relationship exist between bank capital and liquidity.

The proxy for capital adequacy that will be used in this study is the ratio of equity to total assets.

Non-performing loans (NPLR):

NPLs are loans that a customer fails to meet his/her contractual obligations on either principal or interest payments for more than 90 days (NBE 2008). Banks play “Risk Transformation” (riskless deposit to risky loans) in order to stay alive. This measures the quality of banks asset. Unlike other firms banks assets are composed of large amount of loans. If this loan is considered to be uncollectable that leads to reduction in banks profitability and make large number of depositors to fear and run against the bank. Therefore, it is expected that there is negative relationship between bank liquidity and the amount of non-performing loans. The proxy that will be used for non-performing loans is the percentage of non-performing loans in the total amount of bank loan.

Bank Size (Bsize):

Bank size is defined broadly as the banks net total asset. It measures its general capacity to perform its intermediary function. This variable is added to capture the economies or diseconomies of scale. There is consensus in academic literature that economies of scale and synergies arise up to a certain level of size. Beyond that level, financial institutions become too

complex to manage and diseconomies of scale arise (Ezirim, 2005). When bank size grows it will help them to reduce the risk but it should be noted that it may also lead to failure. According to the “too big to fail” argument, large banks would benefit from an implicit guarantee, thus decrease their cost of funding and allows them to invest in riskier assets (Moore, 2005). If big banks are considering themselves as “too big to fail”, their motivation to hold liquid assets is restricted. In case of a liquidity scarcity, they rely on a liquidity assistance of Lender of Last Resort (Ezirim, 2005). Thus, large banks are likely to perform higher levels of liquidity creation that exposes them to losses related with having to sell illiquid assets to fulfill the liquidity demands of customers (Kiyotaki and Moore, 2008). Therefore, “too big to fail” position of large banks could lead to moral hazard behavior and too much risk exposure. This study expected negative impact of bank size on liquidity as per the first argument.

In this study, bank size is measured by the natural logarithm of total asset of the bank because the balance sheet total is an indicator that is simply available for almost all banks and total assets seem to be comparable and based on a straightforward definition: they sum up the volume of a bank’s activities. Hence, the proxy for bank size is the natural logarithm of total assets.

Loan Growth of Banks (LG):

The loan portfolio is naturally the largest asset and the predominate source of revenue. Lending is the major business activity for most commercial banks and loan is one of the most sources of risk to a bank’s safety and soundness (Comptroller’s Handbook, 1998). Since loans are illiquid assets, increase in the amount of loans means increase in illiquid assets in the asset portfolio of a bank. As it was made by different empirical studies as well as the above argument the study expected negative relationship between banks loan growth and liquidity.

The proxy for loan growth is annual growth rate of gross loans and advances to customers.

Loan loss provision (LLP):

It is controlling mechanism over expected loan losses arising from lending business and protected against predictable loss.

According to (Berrospide, 2012) Banks held more liquid assets in response to increased risks in their asset portfolios. In addition to unrealized securities losses, a measure of expected loan losses such as loan loss reserves is also a key driver of liquidity. Intuitively, during the financial crisis, and most likely due to rising worries about the economic outlook, heightened uncertainty

about the credit quality of borrowers may have forced banks to reallocate their assets from riskier loans to secured and liquid securities. Unlike traditional measures of credit quality, such as net charge-offs and delinquent loans, loan loss reserves have a forward-looking component that reflects banks' efforts to increase their loan provisioning in prediction of expected losses, and therefore, provide another motivation to store cash in anticipation of such losses. And therefore the study expected positive relationship between banks liquidity and loan loss provision.

The Proxy of loan loss provision is the ratio of loan loss provision to total loan.

Gross Domestic Product (GDP):

GDP is an indicator of the economic health of a country as well as the measure of a country's standard of living. It is the measurement of level of economic activity of a country. According to previous studies, when the economy is at boom or goes out of recession, economic units including banks are optimistic and increase their loans & advances and as a result decrease their holding of liquid assets. On the other hand, during recession, business operations reduces borrowers' capability to service their obligations which increases bank's NPLs and eventually decreases bank's liquidity.

To proxy the gross domestic products annual GDP growth rate will be used.

Unemployment Rate and Bank Liquidity (UEP):

An increase in the unemployment rate can be interpreted into an increase in non-performing loans and thus decreasing bank liquidity (Trenca et al. 2015). The level of unemployment is connected with demand for loans and can also act as a proxy for the general health of the economy.(Hackethal et al. 2010). The negative influence of the level of unemployment indicate that the economy is healthier, i.e. the lower the unemployment rate, the more liquidity is created by banks. The study by (Vodova, 2012) also supports the above mentioned issues by point out bank liquidity decreases with the higher unemployment rate. However, (Munteanu, 2012) and (Singh and Sharma, 2016) found that unemployment rate had positive impact on bank liquidity and thus the impact thereon is important for (Munteanu, 2012) and insignificant for (Singh and Sharma, 2016). Unemployment rate is computed as percentage of the unemployed population over the total number of economically active population (CSA, 2014). The rate indicates that the number of persons who are ready (aged ten years and above) to participate or engaged in the production of goods and services.

Table 3.1: Summary of explanatory variables and their expected effect on Dependent variables

Variable	Definition	Expected effect
CAP	The share of own capital on total assets of the bank	Positive
NPLR	The share of Non-performing loans on total volume of loans	Negative
BSIZE	Logarithm of total assets of the bank	Negative
LG	Annual loan growth rate	Negative
LLP	Loan loss provision	Positive
GDP	GDP: growth rate of real gross domestic product	Negative
UEP	Unemployment rate	Negative

3.5. Data collection, presentation and analysis techniques

3.5.1. Data and data collection instruments

Only secondary data were used for the study. Accordingly, structured document review used for this research to collect required information, which is relevant for addressing the objectives of the study. The researcher collected Data from audited financial statements (balance sheet and income statement) of each private commercial bank included in the sample and various journals and publications of NBE from 2008 to 2017. All data collected on annual base and the figures for the variables were on June 30 of each year under study.

3.5.2. Data presentation and analysis

Statistical analyses were carried out using the statistical methods to analyze the proposed research objectives and to test the hypotheses. The collected data were interpreted with the help of different financial ratio and statistical descriptions including standard deviation, average, minimum, maximum and median (descriptive statistics) and multiple regressions. A correlation analysis between dependent and independent variables were done and ordinary least square/OLS regression approach including all of its assumption were employed with the help of statistical tools like SPSS16.0 software package. The assumptions were tested to see

the applicability of the regression models developed. A pooled panel data analysis of cross-sectional and time series data was employed. Pooled panel data analysis, also called the constant coefficients model is one where both intercepts and slopes are constant, where the cross section firm data and time series data are pooled together in a single column assuming that there is no significant cross section or temporal effects (Gujarati, 2003). The technique of panel data estimation takes care of the problem of heterogeneity in the Banks selected for the study. Also, by combining time series of cross-section observation, panel data give more informative data, more variability, less co-linearity among the variables, more degree of freedom and more efficiency (Gujarati and Sangeetha, 2007).

3.6 Regression Model specification

The general panel/longitudinal regression model is as follows:

$$y_{it} = \alpha + \beta x_{it} + u_{it}$$

With subscript i denote the cross-section and t representing the time-series dimension. The left-hand variable y_{it} is the dependent variable, α is the intercept term, β is a $k \times 1$ vector of parameters to be estimated on the explanatory variables, and x_{it} is a $1 \times k$ vector of observations on the explanatory variables, $t = 1, \dots, T$; $i = 1, \dots, N$. Therefore the general models which incorporate all of the variables to test the hypotheses of the study are:

$$LIQ_{i,t} = \alpha + \beta_1(CAP_{i,t}) + \beta_2(NPLR_{i,t}) + \beta_3(BSIZE_{i,t}) + \beta_4(LGI_{i,t}) + \beta_5(LLPI_{i,t}) + \beta_6(GDPI_{i,t}) + \beta_7(UEPI_{i,t})$$

Where, $LI_{i,t}$ is liquidity ratio of i th bank on year t

$CAP_{i,t}$ is capital adequacy of i th bank on the year t . the proxy was the ratio of total bank capital to total assets.

$$CAP = \text{equity} / \text{total assets}$$

$NPL_{i,t}$ is the non-performing loan of i th bank on the year t . The proxy was the share of non-performing loan from the total loan portfolio of a bank.

$$NPL = \text{nonperforming loans} / \text{total loans}$$

$BSIZE_{i,t}$ is the size of i th bank on the year t . The proxy was natural logarithm of bank's total assets.

BSize= (*lanoftotalassets*)

LG_{i,t}: is the loan growth of ith bank on the year t. The proxy was percentage change in loan. L is total loans and advances to customers

$$LG = \frac{L_t - L_{t-1}}{L_{t-1}}$$

LLP_{i,t}: is loan loss provision ratio of ith bank on the year t.

The proxy was the share of loan loss provision from the total loan portfolio of a bank.

$$LLP = \frac{\text{Loan loss provision}}{\text{Total loans}}$$

GDP_t: is is the real domestic product/GDP growth of Ethiopia on the year t. The economic growth is measured as percentage change in Gross Domestic Product (GDP).

The proxy was growth rate of real GDP.

UEP_t: Unemployment rate is computed as percentage of the unemployed population over the total number of economically active population (CSA, 2014). The rate indicates that the number of persons who are ready (aged ten years and above) to participate or engaged in the production of goods and services.

The proxy was is unemployment rate in Ethiopia on the year t.

Chapter four

4. Data presentation and analysis

In the preceding chapters important literatures concerning to the topic were reviewed that provides enough understanding about the subject and accustomed isolated knowledge gap on the world. To fulfill the broad research objective and to check research hypotheses under that the research design used for this study also discussed in the preceding chapter. In this chapter the data collected were presented and important correlation and regression analysis findings were discussed.

The current chapter has five sections. Under the first section (section 4.1.) the descriptive statistics of the dependent and independent variables were presented followed by correlation analysis under section 4.2. Section 4.3 presents the test for the classical liner regression model/CLRM. Then, the results of the regression analysis were presented under section 4.4. Finally, discussions for the results of the regression analysis were made under section 4.5.

4.1. Descriptive statistics of the data

The descriptive statistics for the dependent and independent variables are presented below. The dependent variable is liquidity measured by liquid assets to total deposit ratio. The remaining are the independent variables which are: capital adequacy, bank size, loan growth, non-performing loans, loan loss provision ,GDP and unemployment rate. Table4.1 below Present the descriptive statistics of the dependent and independent variables.

Table 4.1. Descriptive statistics

	N	Minimum	Maximum	Mean	Std. Deviation
L1	70	.1661	.7820	.429388	.1813723
CAP	70	.0689	.2013	.111296	.0277746
NPLR	70	.0062	.1901	.040889	.0325578
Bsize	70	20.3350	24.4603	2.297085E1	.7675750
LG	70	-.1088	.8493	.248369	.2030816
LLP	70	.0000	.0983	.023348	.0207689
GDP	70	.076	.126	.10110	.013710
UEP	70	.0181	.0239	.021474	.0017840
Valid N (listwise)	70				

Source: NBE, WorldBank and Own computation

The mean value of L1 was 42.93% which was by far above the statutory requirement of 15% set by NBE under NBE Directives No. SBB/57/2014. But according to (Vodova 2011) the bank is able to meet its obligations in terms of funding (the volume of liquid assets is high enough to cover volatile funding) if the value of ratio of liquid asset to total deposit is 100 % or more. Lower value signifies a bank's increased vulnerability related to deposit withdrawals. Hence, based on the finding of this research the mean value of liquidity (L1) is far below 100%, which signifies the lower capacity of private commercial banks to absorb liquidity shocks.

The standard deviations of 18.13% showed moderate dispersion of liquid assets to total deposits ratio from its mean for the private commercial banks in Ethiopia. The minimum and maximum values of L1 were 16.61% and 78.2%, respectively.

The mean value of capital adequacy was 11.12% which was above the minimum statutory requirement of 8% set by NBE under NBE Directives No. SBB/50/2011. The maximum and minimum values were 20.13% and 6.89%, respectively. The standard deviation for CAP was 2.77% revealing little dispersion towards the mean among private banks in Ethiopia.

The other bank specific factor affecting liquidity of Ethiopian commercial banks was NPLs that measures the asset quality of banks. The mean value of the percentage of non-performing loans in the total amount of loans and advances was 4.08% with the maximum and minimum of 19.01% and 0.62%, respectively. The mean value of 4.08% is within 5% maximum limit of regulatory body. The maximum value of 19.01% indicates the presence of moderate credit risk in some of the banks. There was minor dispersion of NPL among private commercial banks in Ethiopia that is shown by the standard deviation of 3.25%.

Among the bank specific independent variables, bank size which is measured by natural log of total asset had the highest standard deviation 2.29, which means it is the most deviated variable from its mean compared to other variables. The maximum and minimum values were 24.46 and 20.33 respectively. The maximum and minimum values were indicating AIB and CBO respectively.

Loan growth was measured as the annual percentage change in total loans & advances and this showed a mean of 24.83%. This indicates that, on average, growth rate was 24.83% during the ten years period and growth in total asset for the sample period were ranged from -10.88% to 84.93% with standard deviation of 20.30%. The 20.30% of standard deviation indicates the existence of high variation in growth rate among private commercial banks in Ethiopia.

Loan loss provision was measured as the percentage of loan loss provision in the total amount of loan. The mean value of loan loss provision over total loan was 2.33% which reveals that average of 2.33% of total loans are held as loan loss provision with the maximum and minimum percentage of 9.83% and 0%, respectively. There was minor dispersion of loan loss provision among private commercial banks in Ethiopia that is shown by the standard deviation of 2.07%.

The mean value of real GDP growth rate was 10.11 % indicating the average real growth rate of the country's economy over the past 10 years. The maximum growth of the economy was recorded in the year 2010 (i.e. 12.6%) and the minimum was in the year 2016 (i.e. 7.6%) and the standard deviation is 1.3%.

The mean for unemployment rate is 2.1% with minimum and maximum of 1.81% and 2.39% respectively. The standard deviations is very small with 0.17%, this indicates that there is small variations in unemployment rate in Ethiopia i.e. the unemployment rate in Ethiopia is almost constant for sampled period.

4.2. Correlation analysis among variables

According to (Brooks, 2008), correlation between two variables measures the degree of linear association between them. To find the association of the independent variables with the liquidity measured by both L1 Pearson product moment of correlation coefficient was used. Always, a value of the correlation coefficient falls between positive one and negative one. A correlation coefficient of positive one implies that there is a perfect positive association between the two variables; while a correlation coefficient of negative one indicates that a perfect negative association between the two variables. A correlation coefficient of zero, on the other hand, indicates that there is no linear relationship between the two variables.

Table 4.2 Correlation matrix of dependent and independent variables

	L1	CAP	NPLR	Bsize	LG	LLP	GDP	UEP
<i>Pearson Correlation</i> L1	1.000	.001	.335	-.667	-.314	.605	.356	.772
CAP	.001	1.000	-.118	-.245	.013	-.175	-.115	-.113
NPLR	.335	-.118	1.000	-.318	-.494	.566	.005	.267
Bsize	-.667	-.245	-.318	1.000	.045	-.406	-.231	-.612
LG	-.314	.013	-.494	.045	1.000	-.416	-.017	-.345
LLP	.605	-.175	.566	-.406	-.416	1.000	.236	.596
GDP	.356	-.115	.005	-.231	-.017	.236	1.000	.376
UEP	.772	-.113	.267	-.612	-.345	.596	.376	1.000

Source: NBE, World bank report and Own computation

As table 4.2 clearly reveals, a liquid asset to total deposits ratio/L1 was positively correlated with Capital adequacy with a correlation of .001. On the other hand, among bank specific factors NPLs had positive relationship with L1 with a correlation of .335. Bank size had negative relationship with banks liquidity measured by L1 with a correlation of -.667. Loan growth had negative relationship with banks liquidity measured by both L1 with a correlation of -.314 which indicates that firm with higher loan growth have less bank liquidity. Loan loss provision had positive relationship with bank liquidity with a correlation of .605.

Among the macroeconomic factors affecting liquidity, real GDP growth rate and unemployment rate has a positive relationship with bank liquidity with a correlation of .356 and .772 respectively.

4.3. Testing assumptions of classical linear regression model (CLRM)

4.3.1 Test for absence of series multi co linearity assumption

This assumption is concerned with the relationship exist between explanatory variables. If an independent variable is an exact linear combination of the other independent variables, then we say that the model suffers from perfect co linearity, and it cannot be estimated by OLS (Brooks ,2008). Multi-collinearity condition exists where there is high, but not perfect, correlation between two or more explanatory variables (Cameron and Trivedi, 2009; Wooldridge, 2006). According to (Churchill and Iacobucci ,2005), when there is multi-co linearity, the amount of information about the effect of explanatory variables on dependent variables decreases. As a result, many of the explanatory variables could be judged as not related to the dependent variables when in fact they are. This assumption allows the independent variables to be correlated; they just cannot be perfectly correlated. If we did not allow for any correlation among the independent variables, then multiple regressions would not be very useful for econometric analysis.

How much correlation causes multi co linearity however, is not clearly defined. While (Hair et al 2006) argue that correlation coefficient below 0.9 may not cause serious multico linearity problem. (Malhotra ,2007) stated that multico linearity problem exists when the correlation coefficient among variables is greater than 0.75. (Kennedy, 2008) suggests that any correlation coefficient above 0.7 could cause a critical multico linearity problem leading to inefficient estimation and less reliable results. This indicates that there is no consistent argument on the level of correlation that causes multico linearity.

According to(Gujarati ,2004), the standard statistical method for testing data for multico linearity is analyzing the explanatory variables correlation coefficients (CC); condition index (CI) and variance inflation factor (VIF). Therefore, in this study correlation matrix for seven of the independent variables shown below in the table had been estimated. The results in the following correlation matrix show that the highest correlation of 0.59 which is between unemployment rate and loan loss provision. Since there is no correlation above

0.7, 0.75 and 0.9 according to (Kennedy ,2008), (Malhotra ,2007) and (Hair et al ,2006) respectively, we can conclude in this study that there is no problem of multico linearity.

Table 4.3 correlation matrix of explanatory variables

	CAP	NPLR	Bsize	LG	LLP	GDP	UEP
CAP	1						
NPLR	-.118	1					
Bsize	-.245	-.318	1				
LG	.013	-.494	.045	1			
LLP	-.175	.566	-.406	-.416	1		
GDP	-.115	.005	-.231	-.017	.236	1	
UEP	-.113	.267	-.612	-.345	.596	.376	1.

Source: NBE, World Bank report and Own computation

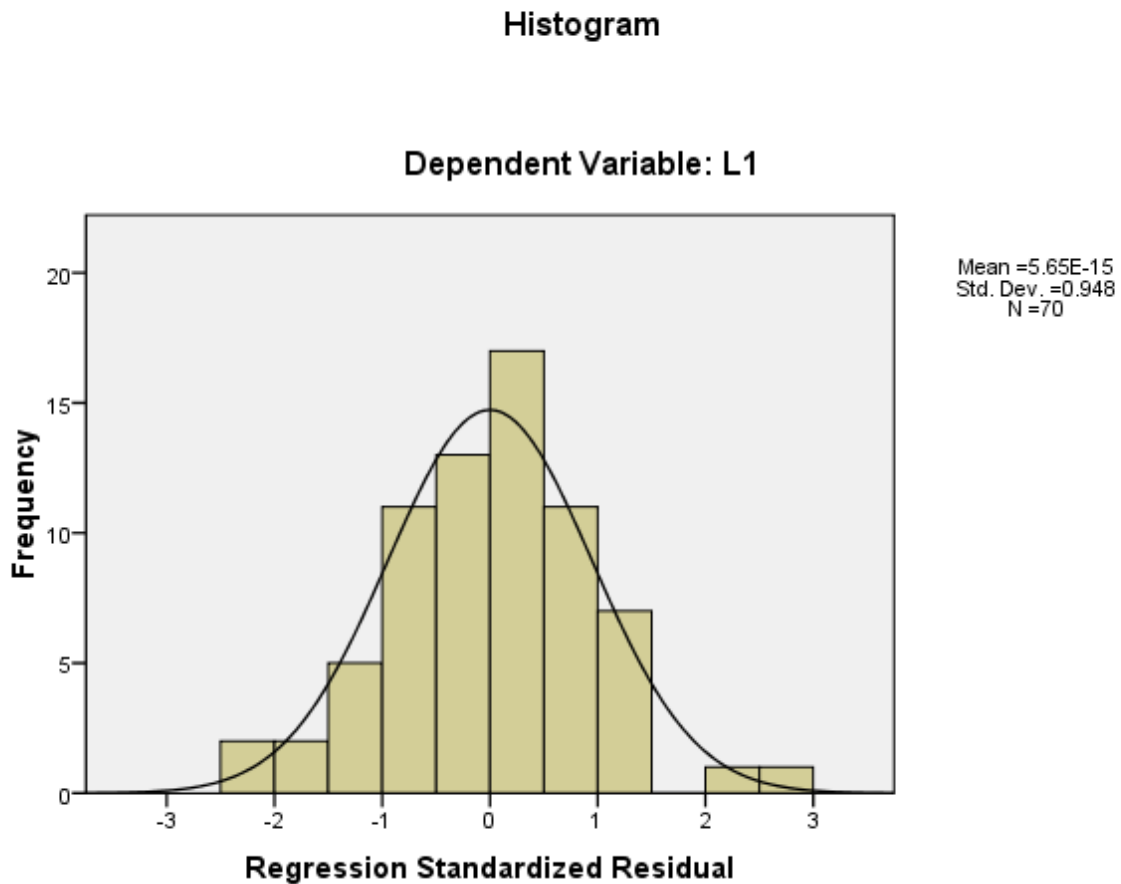
4.3.2 Normality Test

Another important diagnostic test conducted in this study is the normality assumption (i.e. the normally distributed errors). A normal distribution is not skewed and is defined to have a coefficient of kurtosis 3. Skewness measures the extent to which a distribution is not symmetric about its mean value and kurtosis measures how far the tails of the distribution are. If the residuals are normally distributed, the histogram should be bell shaped. The residuals scatter plots allow us to check whether the residuals should be normally distributed about the predicted dependent variable scores. The residual are normally distributed with a mean of zero and standard deviation of one.

As we can understand from the histogram and p-p plot depicted below, the residuals seem normally distributed and the residuals are distributed with a mean of 5.65 and standard deviation of 0.94 which is approximately 1. Thus, the model fulfills the assumption of being normally distributed.

Moreover, in the Normal Probability Plot it is expected that our points will lie in a reasonably straight diagonal line from bottom left to top right which can be confirmed from p-p plot depicted below (fig. 1). this would suggest no major deviations from normality.

Figure 4.1: Histogram for residuals



Source: SPSS regression output

4.3.3 Test of nonlinearity

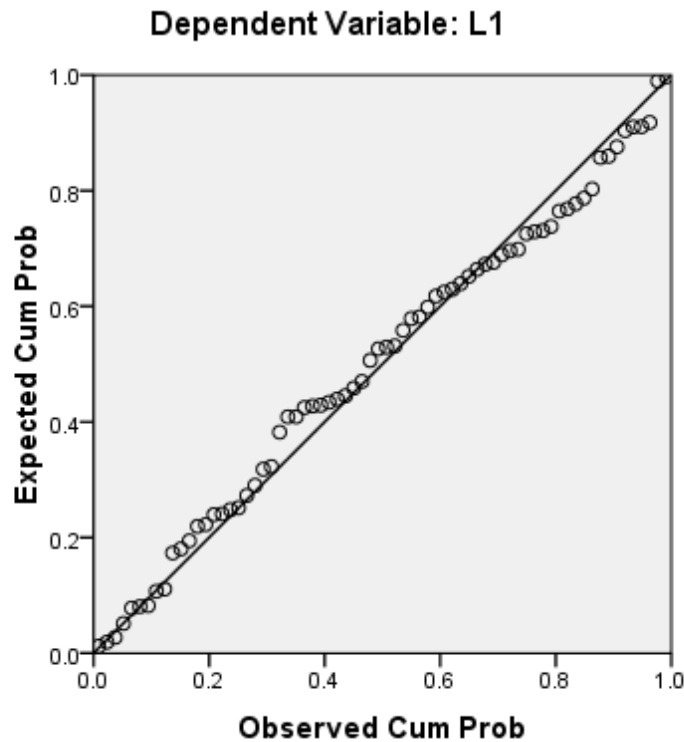
The other assumption of linear regression model is linearity which assumes that the residuals should have a straight-line relationship with predicted dependent variable scores.

If this assumption is violated, the linear regression will try to fit a line to data that do not follows a straight line. This assumption can be checked from a scatter plot among the response variable and the predictor which helps us to identify existence of nonlinearity. As we can see from the

normal-P Plot of regression standardized residual (fig. 2), it seems the linear regression tried to fit the data on a straight line which confirmed existence of linearity.

Figure 4.2:- Normal P-P plot of regression standardized residual

Normal P-P Plot of Regression Standardized Residual



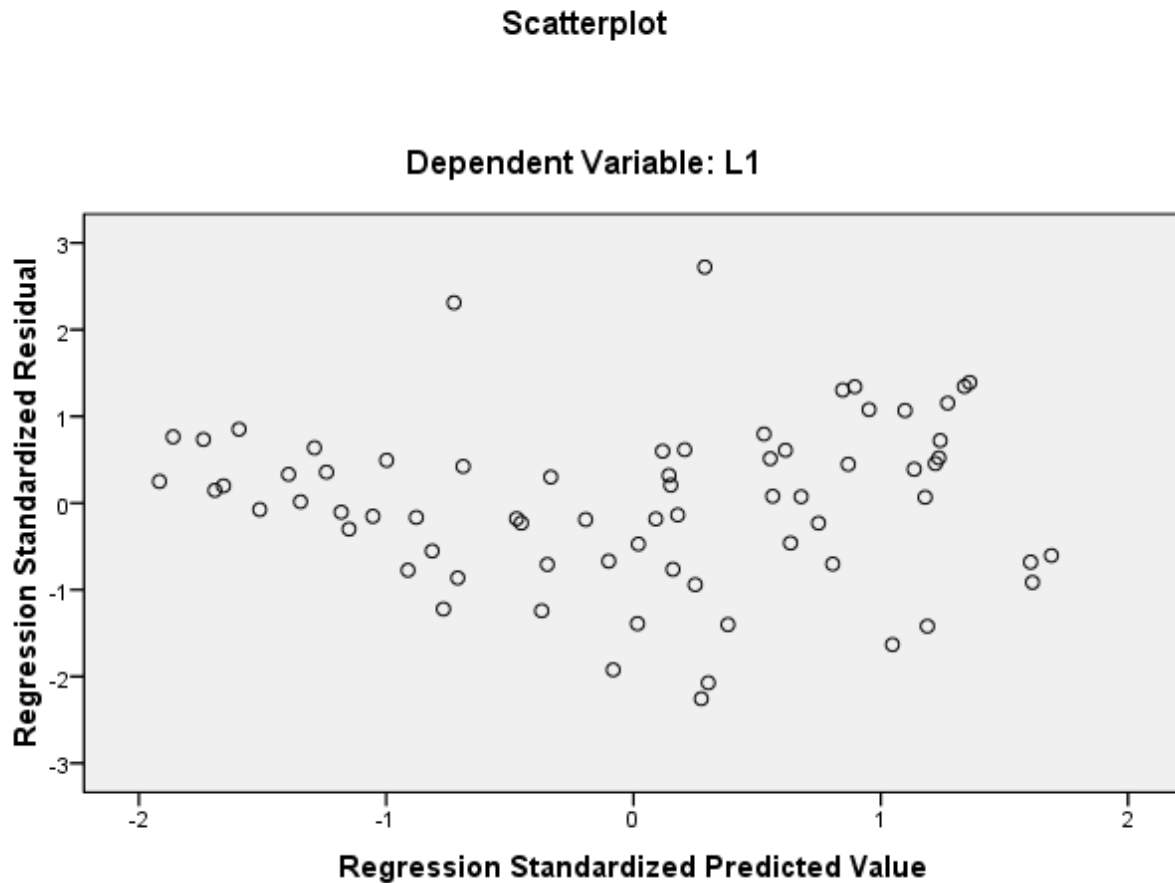
Source: SPSS regression output

4.3.4 Homoscedasticity Test

This assumption is theoretically expressed by Brooks (2008) as “ $\text{var}(u_t) = \sigma^2 < \infty$ ” which has been assumed that the variance of the errors is constant. This is known as the assumption of homoscedasticity. In this assumption the variance of the residuals is homogeneous across levels of the expected values. If the model is well fitted, there should be no pattern to the residuals plotted against the fitted values. If the errors do not have a constant

variance, it is said to be heteroscedastic. As it can be observed from the scatter plot below, the error term seems normally distributed. It also shows a fairly even cigar along its length.

Figure 4.3: Scatter Plot



Source: SPSS regression output

4.4. Results of regression analysis

Under this section the empirical findings from the econometric results on determinants of bank liquidity of private commercial banks in Ethiopia were presented. The section covers the empirical regression model used in this study and the results of the regression analysis.

Table 4.4 presents the estimation results of the operational panel regression model of liquid assets to total deposits ratio (L1) as dependent variable and bank specific explanatory variables for the sample of seven private commercial banks in Ethiopia. The explanatory power of this model is high that is around 65.9% which indicates that the changes in the

independent variables explain 65.9 % of the changes in the dependent variable. That means equity to total asset ratio, non-performing loans, bank size, loan growth ,loan loss provision, GDP growth rate and unemployment rate collectively explain 65.9% of the changes in liquidity measured by the ratio L1. The remaining 34.1% of changes was explained by other factors which are not included in the model. Thus, these variables together are good explanatory variables that explain the liquidity of private commercial banks in Ethiopia.

According to the results shown in table 4.4, capital adequacy, Non-performing loan, Loan growth and GDP were the statistically insignificant factor affecting liquidity of private commercial banks in Ethiopia. Bank size had significant impact on liquidity at 1% significance level. Loan loss provision and unemployment rate had significant impact on liquidity at 10% and, 1% significant level respectively. The coefficient sign capital adequacy, non performing loan, Bank size, loan growth, loss provision and unemployment rate meet the expectation of the researcher but the sign of GDP growth rate were opposite to the expectation.

Moreover, table 4.4also shows that the coefficient signs of non-performing loan, Bank size and loan growth were negative as far as their respective coefficients for those variables were -.180,-.077,&-.084. This indicates that there was an inverse relationship between these three independent variables and L1. Thus the increase of those variables will lead to a decrease in liquidity measured by L1.On the other hand capital adequacy, loan loss provision, GDP growth rate and unemployment rate had a positive relationship with liquidity measured by the ratio L1 with respective coefficient of 0.49, 1.68, 1.088 and 40.942. This revealed that there is a direct relationship between loan loss provision and L1.

Table 4.4 Regression results

Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.833 ^a	.694	.659	.1058407	1.305

a. Predictors: (Constant), UEP, CAP, NPLR, GDP, LG, LLP, Bsize

b. Dependent Variable: L1

Model		Unstandardized Coefficients		Standardized	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.198	.846		1.417	.162		
	CAP	.049	.539	.008	.091	.927	.725	1.379
	NPLR	-.180	.560	-.032	-.321	.749	.488	2.051
	Bsize	-.077	.026	-.327	-2.927	.005	.396	2.527
	LG	-.084	.084	-.095	-1.011	.316	.564	1.772
	LLP	1.688	.909	.193	1.857	.068	.456	2.195
	GDP	1.088	1.021	.082	1.066	.291	.829	1.207
	UEP	40.942	12.171	.403	3.364	.001	.344	2.904

a. Dependent Variable: L1

4.5. Discussion of the regression results

➤ Capital adequacy and liquidity

In this study, capital adequacy was measured by the ratio of total capital of the bank to total asset of the bank and it was hypothesized that capital adequacy has positive and significant impact on bank's liquidity. Based on the regression result, capital adequacy was statistically insignificant impact on the determination of liquidity of Ethiopian private commercial banks which was measured by L1. While the coefficient sign of 0.49 reveals that, there is a positive relation between liquidity of private commercial banks measured by L1 and capital adequacy of banks. This shows that, when capital to total asset is increases by 1 unit, the liquidity of private commercial banks is also increased by 0.49 units being other variables remains constant. This positive relation of the share of capital to total asset with liquidity is consistent with the assumption that a bank with sufficient capital adequacy should be liquid too and in line with the risk absorption theory proposed by (Diamond and Dybvig ,1983) and the findings of (Vodova,2013) on Hungary commercial banks. However, as per the finding of this study Capital adequacy has no statistically significant impact on the liquidity position of Ethiopian private commercial banks. Therefore, the hypotheses stated; Capital adequacy has positive and significant impact on banks liquidity was rejected.

➤ **Nonperforming loan and liquidity**

The proxy for non-performing loans is the share of non-performing loans on total volume of loans & advances. The regression result of the model indicates that non-performing loans had negative but statistically insignificant impact on liquidity of Ethiopian private commercial banks. The negative and statistically insignificant impact of NPL on liquidity as per L1 was inconsistent with hypothesis (2).

The result reveals that, taking all other things constant, a one percent change on non-performing loans ratio had a -18 % change on liquidity of commercial banks measured by L1. The negative relation of NPL to liquidity is consistent with the assumption that the increased of non-performing loan portfolios in banks significantly contributed to financial suffering in the banking sector. Non-performing loans are the main contributor to liquidity risk, which exposes banks to insufficient funds for operations. As major portion of bank's assets composed of loan and advances, when they become non-performing, it will affect both profitability and liquidity of the bank. However, as per the finding of this study NPL has no statistically significant impact on the liquidity position of Ethiopian private commercial banks. Therefore, the study rejects the 2nd hypothesis saying has negative and significant impact on bank's liquidity.

➤ **Bank Size and Bank's Liquidity**

The proxy for bank size in this study is the natural logarithm of total asset and hypothesized as bank size has negative and significant impact on banks liquidity. The result in this study revealed that bank size had a negative and statistically significant impact on liquidity of private commercial banks in Ethiopia which was measured by L1 at 1% significant level. This negative sign of the coefficient indicates an opposite relationship between bank size and bank's liquidity. This finding fully agrees to the well-known "too big to fail" hypothesis and seem like that if big banks assuming themselves as "too big to fail", their motivation to hold liquid asset is limited. According to the "too big to fail" argument, big banks would benefit from an implicit guarantee, thus reduce their cost of funding and allows them to invest in riskier assets (Iannotta et al. 2007). Hence, "too big to fail" positions of large banks might lead to moral hazard behavior and extreme risk exposure. In case of a liquidity shortage, they rely on a liquidity assistance of Lender of Last Resort (Vodova, 2011). The result of L1 reveals that, being other variables constant, a one birr change on bank size had resulted in a 0.07birr change on liquidity of Ethiopian private commercial banks in opposite direction. This was in line with the findings of (Vodova, 2011) on Hungary Commercial banks but opposite to the findings of (Malik and

Rafique, 2013) on Pakistan commercial banks. Generally, the result in of L1 reveals that, bank liquidity decreases with the size of the bank. Thus, the study failed to reject the hypothesis: bank size has negative and significant impact on banks liquidity.

➤ **Loan Growth Rate and Bank's Liquidity**

As lending is the principal business activity of commercial banks, loans & advances is the major asset of a bank. In this study, the annual growth rate of gross loans and advances to customers was used as a proxy for loan growth. The result of the study indicated that, loan growth had a negative and statistically insignificant impact on liquidity of Ethiopian private commercial banks. The negative relation and statistically insignificant impact of loan growth on liquidity was inconsistent with the hypothesis.

The negative sign of Loan growth is consistent with the argument that, when loans & advances of a bank increases, the amount of illiquid asset in the total asset portfolio would also increases and leads to reduction of liquid asset position of the bank. This negative sign of the coefficient indicates an opposite relationship between loan growth and liquidity. According to the regression result, a one percent change in the loan growth rate, keeping other things constant, had resulted in 8.4% change on the level of liquidity of commercial banks measured by L1 in the opposite direction. However, as per the finding of this study Loan growth has no statistically significant impact on the liquidity position of Ethiopian private commercial banks. Therefore, the study rejects the 4th hypothesis saying; loan growth has negative and significant impact on bank's liquidity.

➤ **Loan loss provision and Bank's Liquidity**

The proxy for loan loss provision in this study is the ratio of loan loss provision over total loans. The result in this study found that loan loss provision had a positive and statistically significant impact on liquidity of Ethiopian private commercial banks which was measured by L1 at 10% significant level. The result reveals that, taking all other things constant, a one percent change on loan loss provision ratio had a 168% change on liquidity of commercial banks measured by L1. The positive and statistically significant impact of LLP on liquidity as per L1 was consistent with hypothesis (5) and in line with the finding of (Berrospide ,2012) that states banks accumulated more liquid assets in response to increased risks in their asset portfolios. Additionally, to unrealized securities losses, a measure of expected loan losses such as loan loss

reserves is also a major driver of liquidity. Intuitively, during the financial crisis, and most probably due to growing worries about the economic outlook, heightened uncertainty about the credit quality of borrowers may have forced banks to move their assets from riskier loans to safe and liquid securities. Unlike traditional measures of credit quality, for instance, net charge-offs and delinquent loans, loan loss reserves have a forward-looking component that reflects banks' efforts to expand their loan provisioning in prediction of expected losses, and so, give another motivation to store cash in anticipation of such losses. Therefore, the study failed to reject the 5th hypothesis saying, loan loss provision has positive and significant impact on bank's liquidity.

➤ **Gross domestic product and Bank's liquidity**

This study reveals that GDP has positive and insignificant impact on liquidity of private commercial banks in Ethiopia. The positive sign of GDP is inconsistent with hypothesis (6) but consistent with studies conducted by Angora and (Roulet, 2011) and (Cucinelli,2013), which state that the real annual GDP growth rate has positive relationship with banks' liquidity because the increase in individual income leads to save excess amount in banks. And the study by (Bunda and (Desquilbet, 2008) and (Moussa ,2015) also found that when there is an increase in the level of GDP, we have an increase in economic well-being, which in the banking context is related to the fact that during this period clients maintain a higher level of deposits in banking institutions and the likelihood of withdrawal of these deposits during economic growth is very small. However, as per the finding of this study GDP has no statistically significant impact on the liquidity position of Ethiopian private commercial banks

Therefore, the study rejects the 6th hypothesis saying GDP has negative and significant impact on liquidity.

➤ **Unemployment rate and Banks liquidity**

The results of regression analysis discovered that unemployment rate is statistically significant at 1% significant level to determine the liquidity of private commercial banks in Ethiopia The coefficient of unemployment rate is 40.94 shows that the relationship between unemployment rate and liquidity of commercial banks is positive which is against previous studies made by (Trenca et al. ,2015), (Vodova ,2012) and (Hackethal et al. ,2010) and against the hypothesis (7) but aligned with studies by (Munteanu ,2012) and (Singh and Sharma ,2016); and correspondingly one percent change in unemployment rate leads to change in the liquidity of commercial banks by 409% in the same direction..

The positive relationship between the liquidity of commercial banks and unemployment rate is due to the fact that banks may not be willing to invest in illiquid assets when the unemployment rate is high due to high risk of default but keep liquid assets to meet unexpected withdrawals. Consequently, unemployment rate is the major factor affecting liquidity of commercial banks in Ethiopia as its change has huge changes in liquidity and its significance is also very high based on regression result.

Therefore, the study rejects the 7th hypothesis saying UEP has negative and significant impact on liquidity.

Table 4.5 Summary of actual and expected signs of explanatory variables on the dependent variables

Explanatory variable	Expected impact on liquidity	Actual impact on Liquidity
CAP	Positive & significant	Positive & insignificant
NPLR	Negative & significant	Negative & insignificant
BSIZE	Negative & significant	Negative & significant
LG	Negative & significant	Negative & insignificant
LLP	Positive & significant	Positive & significant
GDP	Negative & significant	Positive & insignificant
UEP	Negative & significant	Positive & significant

CHAPTER FIVE

5. Summary, Conclusion and recommendations

5.1 Summary

The main objective of this study was to identify the macroeconomic and bank specific determinants of liquidity of Ethiopian private commercial banks. To comply with the objectives of the study, five bank specific and two macroeconomic variables were used. The bank specific variables include; capital adequacy, bank size, loan growth, non-performing loans and Loan loss provision and also the macroeconomic variables were real GDP and unemployment rate. Based on the analysis the following major results are found:

- Liquidity ratio measured as the ratio of liquidity to total deposits is far below from 100 %, which signifies the lower capacity of private commercial banks to absorb liquidity shocks.
- The study also confirmed, among the bank specific variables; Bank size and loan loss provision had statistically significant impact on the determination liquidity of Ethiopian private commercial banks measured by L1.
- Among the macro-economic variables only unemployment rate had statistically significant impact on liquidity of Ethiopian private commercial banks.

5.2 Conclusion

The fundamental role of banks in the maturity transformation of short term deposits into long term loans exposed banks to liquidity risk, both of bank specific nature and that affects markets as a whole (Sundararajan&Balino, 2011).Liquidity creation is the principal reason why commercial banks exist .

The study was used panel data for the sample of seven private commercial banks in Ethiopia which had ten years of banking service over the period 2008 to 2017. Data was presented and analyzed by using descriptive statistics, correlation analysis and balanced fixed effect regression analysis to identify the determinants of liquidity of Ethiopian private commercial banks which were measured by liquid asset to deposit ratio.

Before performing the regression analysis, test for CLRM assumption were conducted and all assumptions were satisfied.

The objective of the study was identifying the macroeconomic and bank specific determinants of liquidity of Ethiopian private commercial banks. To comply with the objectives of the study, five bank specific and two macroeconomic variables were used.

The result of this study indicated that the liquidity ratio measured as the ratio of liquidity to total deposits is far below from 100 %, which implies the lower capacity of private commercial banks to absorb liquidity shocks. The study also confirmed, among the bank specific variables; Bank size and loan loss provision had statistically significant impact on the determination liquidity of Ethiopian private commercial banks measured by L1. And among the macro-economic variables only unemployment rate had statistically significant impact on liquidity of private commercial banks of Ethiopia.

The result of this study confirmed that, the coefficient sign for capital adequacy revealed positive and insignificant impact on liquidity. The result of the study also found that share of nonperforming loans has negative and statistically insignificant impact on liquidity of private commercial banks in Ethiopia. Bank liquidity decreases with the size of the bank: big banks depend on the bank to bank market or on a liquidity aid of the Lender of Last Resort, small and medium sized banks accumulate much of liquid assets which is fully in accordance with “too big to fail” hypothesis. Among the bank specific determinants of liquidity Loan growth has negative but statistically insignificant impact on liquidity of Ethiopian private commercial banks. The remaining bank specific factor was loan loss provision which is measured by the ratio of loan loss provision over total loans has positive and significant impact on banks liquidity. Among macro-economic factors that affect liquidity Gross domestic product growth rate has positive and insignificant impact on liquidity of private banks in Ethiopia. The positive and significant impact of unemployment rate was inconsistent with the hypothesis but consistent with the assumption that banks held more liquid assets in response to increased risks in their asset portfolios.

5.3 Recommendation

Based on the results of the research the following recommendations were given:

- 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 should also enhance their deposit through intensive expansion of their customer base by making the product accessible to customers.
- Bank size, Loan loss provision and unemployment rate are key indicators or drivers which influences the liquidity of Ethiopian private commercial banks. Hence, private commercial banks of Ethiopia should give special emphasis on these variables which tend to improve the liquidity position of their banks.
- The negative relationship between bank size and liquidity revealed the “too big to fail” hypothesis, in which banks with large total assets may encourage to disburse more loans and advances. Thus, such banks should pursue a balanced approach of their credit and liquidity management, which helps to manage their liquidity position.
- Among the macroeconomic determinants of banks liquidity unemployment rate has positive and significant impact on liquidity which is due to the fact that when the unemployment rate is high, banks may not be willing to invest in illiquid assets (loans) due to high risk of default but keep liquid assets to meet unexpected withdrawals. But rather than holding excess liquidity banks can reduce their risk of default by amending their credit policy, making proper analysis while granting loans together with regular monitoring and follow-up.

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Appendices

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
L1	70	.1661	.7820	.429388	.1813723
CAP	70	.0689	.2013	.111296	.0277746
NPLR	70	.0062	.1901	.040889	.0325578
Bsize	70	20.3350	24.4603	2.297085E 1	.7675750
LG	70	-.1088	.8493	.248369	.2030816
LLP	70	.0000	.0983	.023348	.0207689
GDP	70	.076	.126	.10110	.013710
UEP	70	.0181	.0239	.021474	.0017840
Valid N (listwise)	70				

Variables Entered/Removed^b

Model	Variables Entered	Variables Removed	Method
1	UEP, CAP, NPLR, GDP, LG, LLP, Bsize ^a		Enter

a. All requested variables entered.

b. Dependent Variable: L1

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.833 ^a	.694	.659	.1058407	1.305

a. Predictors: (Constant), UEP, CAP, NPLR, GDP, LG, LLP, Bsize

b. Dependent Variable: L1

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.575	7	.225	20.089	.000 ^a
	Residual	.695	62	.011		
	Total	2.270	69			

a. Predictors: (Constant), UEP, CAP, NPLR, GDP, LG, LLP, Bsize

b. Dependent Variable: L1

Coefficients^a

Model		Unstandardized Coefficients		Standardized	t	Sig.	Collinearity Statistics	
		B	Std. Error	Coefficients			Tolerance	VIF
				Beta				
1	(Constant)	1.198	.846		1.417	.162		
	CAP	.049	.539	.008	.091	.927	.725	1.379
	NPLR	-.180	.560	-.032	-.321	.749	.488	2.051
	Bsize	-.077	.026	-.327	-2.927	.005	.396	2.527
	LG	-.084	.084	-.095	-1.011	.316	.564	1.772
	LLP	1.688	.909	.193	1.857	.068	.456	2.195
	GDP	1.088	1.021	.082	1.066	.291	.829	1.207
	UEP	40.942	12.171	.403	3.364	.001	.344	2.904

a. Dependent Variable: L1

CollinearityDiagnostics^a

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions							
				(Constant)	CAP	NPLR	Bsize	LG	LLP	GDP	UEP
1	1	6.793	1.000	.00	.00	.00	.00	.00	.00	.00	.00
	2	.778	2.955	.00	.00	.06	.00	.12	.08	.00	.00
	3	.206	5.743	.00	.02	.04	.00	.32	.48	.00	.00
	4	.162	6.468	.00	.01	.68	.00	.28	.11	.00	.00
	5	.046	12.173	.00	.65	.00	.00	.03	.07	.04	.00
	6	.011	24.401	.00	.04	.03	.01	.00	.03	.87	.01
	7	.004	42.930	.00	.00	.00	.03	.02	.22	.09	.45
	8	.000	216.627	1.00	.28	.18	.96	.23	.00	.00	.55

a. Dependent Variable: L1

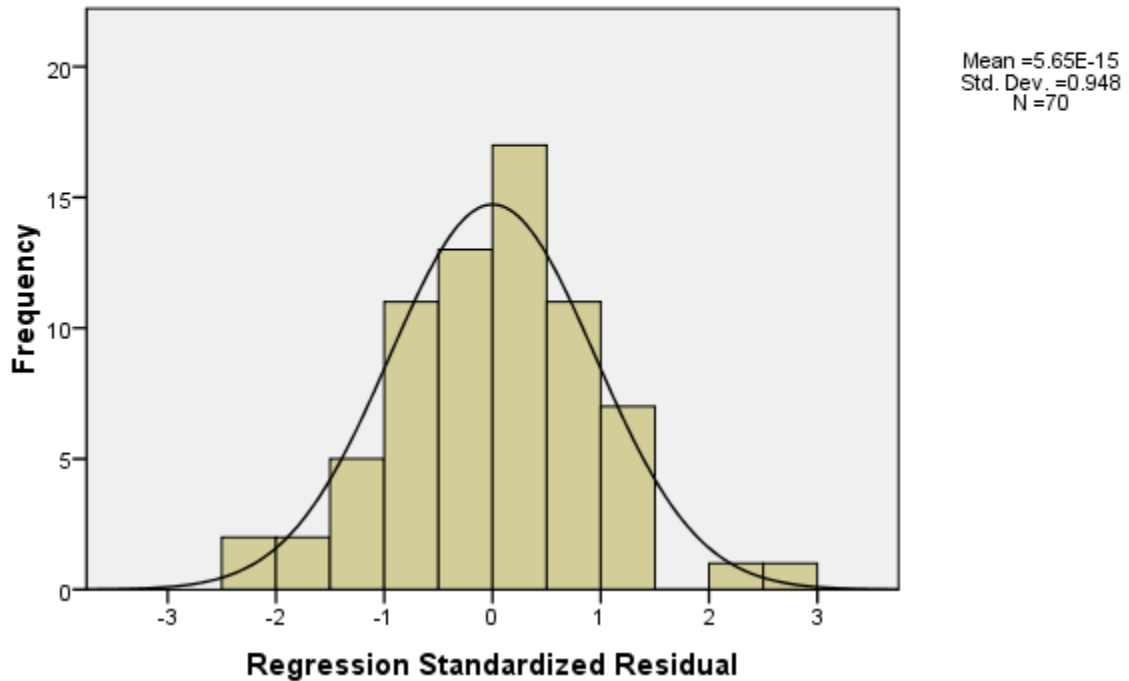
Residuals Statistics^a

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	.139782	.684717	.429388	.1510964	70
Residual	-2.3881358E-1	.2880435	.0000000	.1003284	70
Std. Predicted Value	-1.917	1.690	.000	1.000	70
Std. Residual	-2.256	2.721	.000	.948	70

a. Dependent Variable: L1

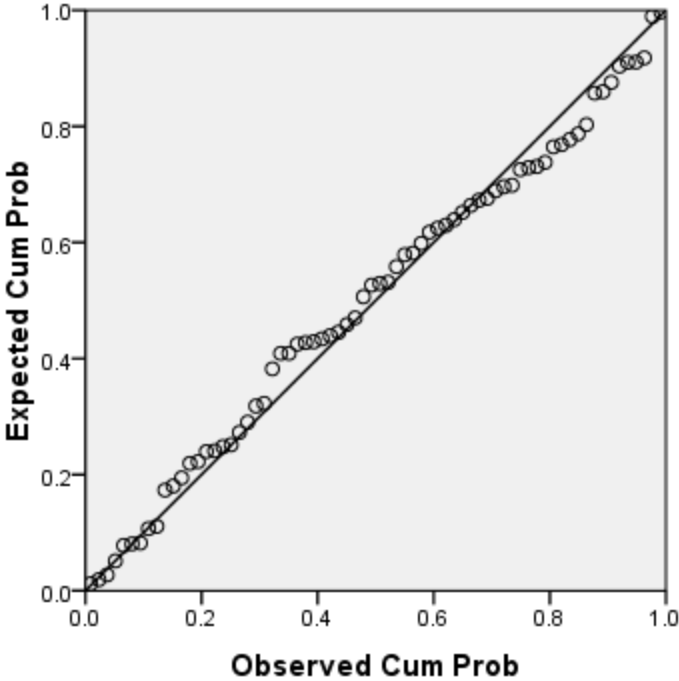
Histogram

Dependent Variable: L1



Normal P-P Plot of Regression Standardized Residual

Dependent Variable: L1



Scatterplot

Dependent Variable: L1

