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Does Liquidity Determine Profitability of Ethiopian Private Commercial Banks?

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**Addis Ababa, Ethiopia
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Does Liquidity Determine Profitability of Ethiopian Private Commercial Banks?

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A thesis submitted to the Department of Accounting and Finance in partial fulfillment of the requirement for the degree of Master of Science in Accounting and Finance

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**Addis Ababa, Ethiopia
December, 2018**

Addis Ababa University
College of Business and Economics
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Declaration

I, the undersigned, declare that the thesis work entitled “***Does liquidity determine profitably of Ethiopian private commercial banks?***” submitted by me for the award of the degree of Master of Accounting and Finance of Addis Ababa University at Addis Ababa Ethiopia, is original work and it hasn’t been presented for the award of any other Degree, Diploma, Fellowship or other similar titles of any other university or institution.

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This is to certify that the thesis prepared by Tilahun Getachew entitles: “*Does liquidity determine profitably of Ethiopian private commercial banks?*” and submitted in partial fulfillment of the requirements for the degree of masters of Science in accounting and finance compiles with the regulations of the university and meets the accepted standards with respect to originality and quality.

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Abstract

The major focus of this study is to answer the question does liquidity determine profitability's in the case of private commercial banks in Ethiopia. Eight private commercial banks were included in the sample that had at least ten years annual report out of sixteen. Document review was used for collecting data from 2008- 2017 annual reports. In line with this objective, the study adopted quantitative methods of research approaches to test the study hypothesis. The study applied return on assets as the proxy for financial profitability and panel data with its fixed effect estimate to test a series of hypotheses that emerge through the review of existing literature. The collected data then analyzed using descriptive statistics, correlation analysis, and panel data regression analysis. To confidently forward conclusion, normality, multicollinearity, heteroscedasticity and autocorrelation tests were conducted on the data. The data then were processed using Eviews 10 statistical package. The results show that: the profitability of sampled banks was determined by their liquidity. Overall variables such as liquid assets to total asset ratio, liquid assets to total deposit ratio, loan to total asset ratio and loan to total deposit ratio found positive significant influence on profitability of private commercial banks in Ethiopia. Finally, private commercial banks most focus on effective liquidity management to maximize their profitability was given as recommendation.

Keywords: *Liquidity, ROA, commercial bank*

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List of Acronyms

AIB	Awash International Bank S.C
AB	Abay Bank S.C.
AdIB	Addis international Bank SC
BOA	Bank of Abyssinia S.C
BBI	Berhan International Bank S.C
BIB	Bunna International Bank S.C
CBE	Commercial Bank of Ethiopia
CBB	Construction & Business Bank
CBO	Cooperative Bank of Oromia S.C
CLRM	Classical Liner Regression Model
DBE	Development Bank of Ethiopia
DB	Dashen Bank S.C
DGB	Debub Global Bank S.C.
EB	Enat Bank S.C.
LIB	Lion International Bank S.C
LA_TD	Liquid Assets to Total Deposit
L_TD	Loan to Total Deposit
L_TA	Loan to Total Asset
LA_TA	Liquid Assets to Total Assets
NBE	National Bank of Ethiopia
NOI	Net Operating Income

NIM	Net Interest Margin
NIB	Nib International Bank S.C
OECD	Organization for Economic Cooperation and Development
OIB	Oromia International Bank S.C
OLS	Ordinary List Square
PCBsE	Private Commercial Banks in Ethiopia
ROE	Return on Equity
ROA	Return on Assets
UB	United Bank S.C
WB	Wegagen Bank S.C
ZB	Zemen Bank S.C

Chapter One:

1. Introduction

1.1. Background of the Study

Banks are financial institutions that play intermediary role in the economy through channeling financial resources from surplus economic units to deficit economic units. In turn, they facilitate the saving and capital formation in the economy. In performing these activities, banks are highly dependent upon public confidence and requirement to meet increasing customers' needs and expectations. To fulfill these expectations banks' liquidity position plays a significant role.

(CH-4002 Basel, September 2008) defined liquidity as the ability of a bank to fund increase in assets and meet its obligations as they come due without incurring unacceptable losses. Hence, liquidity risk arises from the fundamental role of banks in the maturity transformation of short-term deposits into long-term loans. More specifically, liquidity risk arises when liability holders such as depositors demand the most liquid asset- cash or when holders of off-balance sheet loan commitments exercise their right to claim the amount (Saunders, Cornett, & Marcia, 2004). Thus, bank's management must be able to measure and monitor its liquidity position frequently to be able to directly meet liability holder's and borrowers demand so that it can maximize its profit.

Liquidity risk is said to be assassin of banks. This risk can adversely affect both bank's earnings and the capital. Therefore, it becomes the top priority of a bank's management to ensure the availability of sufficient funds to meet future demands of providers and borrowers, at reasonable costs. Episodes of failure of many conventional banks from the past and the present provide the testimony to this claim. It is evident that liquidity and liquidity risk is very up-to-date and important topic. Therefore banks and more so their regulators are keen to keep a control on liquidity position of banks.

(Niresh, 2012) describe that liquidity is of major importance to both the internal and external analysts' because of its close relationship with day to day operations of a business. A weak liquidity position poses a threat to the solvency as well as profitability of a firm and makes it unsafe and unsound.

Therefore, this paper attempted to empirically study the relationship between liquidity and profitability of private commercial banks in Ethiopia (PCBsE).

1.2.Overview of Banking History in Ethiopia

The agreement that was reached in 1905 between Emperor Minilik II and Mr. MaGillivray, representative of the British owned National Bank of Egypt marked the introduction of modern banking in Ethiopia. Following the agreement, the first bank called Bank of Abyssinia was inaugurated in Feb16, 1906 by the Emperor. It was a private bank whose shares were sold in Addis Ababa, New York, Paris, London, and Vienna (NBE, 2013). In 1931, Emperor Haile Selassie introduced reforms into the banking system and the Bank of Abyssinia was liquidated and became the Bank of Ethiopia, a fully government-owned bank providing central and commercial banking services until the Italian invasion of 1936. During the Italian invasion, Bank of Italy was formed a legal tender in Ethiopia. In 1943, after Ethiopia regains its independence from fascist Italy, the State Bank of Ethiopia was established, with two departments performing the separate functions of an issuing bank and a commercial bank. In 1963, these functions were formally separated and the National Bank of Ethiopia (the central and issuing bank) and the Commercial Bank of Ethiopia are formed. In the period up to 1974, several other financial institutions emerged including the state owned as well as private financial institution.

Further, as per the (NBE, 2013), following the declaration of command economy by Dergue regime in 1974 the government extended its control and nationalized all of previously established private banks and merged into one bank. After nationalization the Dergue regime leave only three government banks; the National Bank of Ethiopia, the Commercial Bank of Ethiopia and Agricultural and Industrial Development Bank (Mortgage Bank). This was reversed when the socialist regime was overthrown in 1991. Subsequently, the licensing and supervision of Banking Business Proclamation No. 84/1994 was issued in 1994 which led to the beginning of a new era for Ethiopia banking sector.

As per NBE's last replaced liquidity requirement directives No. SBB/57/2014, "liquid assets" includes cash, deposits with the National Bank and other local and foreign banks having acceptance by the National Bank, other assets readily 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; and "current liabilities" refers to the sum of demand

(current) deposits, savings deposits and time deposits and similar liabilities with less than one month maturity.

After the overthrow of the Dergue regime by the EPRDF, the Transitional Government of Ethiopia was established and the New Economic Policy for the period of transition was issued. This new economic policy replaced centrally planned economic system with a market-oriented system and ushered in the private sector. The new banking law [Proclamation no. 84/1914] was passed in January 1994. This established the minimum capital requirement for establishing a commercial bank (Br. 10 million, US\$ 1.7 million at end-1994) and capital adequacy ratio (8% of risk weighted assets). As a result, currently, the country has three public-owned and sixteen private banks, which are operating throughout the country (NBE 2013/2014). The three governments owned banks are Development Bank of Ethiopia (DBE), Commercial Bank of Ethiopia (CBE) and Construction & Business Bank (CBB) but Commercial Bank of Ethiopia (CBE) and Construction & Business Bank (CBB) are merged together. The sixteen privately owned banks are

- ✓ Dashen Bank S.C (DB),
- ✓ Awash International Bank S.C (AIB),
- ✓ Wegagen Bank S.C (WB),
- ✓ United Bank S.C (UB),
- ✓ Nib International Bank S.C (NIB),
- ✓ Bank of Abyssinia S.C (BOA),
- ✓ Lion International Bank S.C (LIB),
- ✓ Cooperative Bank of Oromia S.C (CBO),
- ✓ Berhan International Bank S.C (BBI),
- ✓ Bunna International Bank S.C (BIB),
- ✓ Oromia International Bank S.C (OIB),
- ✓ Zemen Bank S.C (ZB),
- ✓ Abay Bank S.C. (AB),
- ✓ Addis international Bank SC. (AdIB),
- ✓ Debub Global Bank S.C. (DGB) and
- ✓ Enat Bank S.C. (EB)

After the proclamation the first private bank, Awash International Bank was established in 1994 followed by Dashen Bank and Bank of Abysinia (BOA) which was established on 1995 and

1996 respectively. After a year of the establishment of BOA, Wegagen Bank joined the banking industry and started its operation in 1997. The fifth private bank, United Bank was established in September, 1998 followed by NIB International Bank that started operation in May, 1999 and ten more banks were established in succession, with Enat Bank being the 16th private bank to join the banking industry on March, 2013.

In doing so, as the competition gets higher and higher in the sector, so does the minimum paid up capital. According to industry players, back in the days, the first private banks in to be incorporated in Ethiopia has started operations with much smaller paid up capital; in a range of 20 to 50 million birr. Through time, the threshold was declared to 75 million birr via NBE directive issued in 1999. Almost a decade later, the threshold was raised again, this time around to 500 million birr, causing quite a stir in the industry. Although not yet written in the form of directive, NBE has informed bankers that they are to be required to post a minimum of two billion birr and more paid up capital during the coming five years to continue as a bank in Ethiopia.

When viewed against these bank capital concepts and ramifications, currently, we find the state-owned banks to have the required paid-up capital, with the Commercial Bank of Ethiopia (CBE), the largest bank in the industry, holding four times the future minimum paid-up capital requirement totaling 2 billion Br at end June 2015.

Of the sixteen private commercial banks, AIB had by June 2015 close to 1.8 billion Br, Wegagen Bank holds nearly 1.5 billion Br, and three other banks, namely, Nib International, Dashen and Bank of Abyssinia have paid-up capital just above one billion birr. United Bank has paid-up capital below one billion birr, amounting Br. 975 million. These six private banks are categorized as medium-sized banks. The remaining ten banks, categorized as small banks in the banking industry, holding paid-up capital ranging from br. 198 million to br. 865 million.

In general, the 27% NBE bill requirement, required minimum paid up capital, required loan structure portfolio and greater control of state owned banks (CBE) in the industry with that of the privilege of handling exclusively the 40/60 and 20/80 housing scheme and the unanticipated actions that led run on banks to the industry by siphoning-off funds away from other banks, has brought a serious problem to the private banks in terms of liquidity and profitability.

1.3.Statement of the Problem

Banks are the main part of the financial sector in any economy, performing valuable activities on both sides of the balance sheet. On the asset side, they enhance the flow of funds by lending to the cash starved users of funds, whereas they provide liquidity to savers on the liability side Diamond & Rajan, (2001). In the course of the financial inter-mediation role, commercial banks reactivate the idle funds borrowed from the lenders or depositors by investing such funds in different classes of portfolios. Such business activity of a bank is not without problems since the deposits from these fund savers which have been invested by the banks for profit maximization, can be recalled or demanded when the later is not in position to meet their financial obligations. Considering the public loss of confidence as a result of bank distress which has affected the financial and the intensity of competition in the banking sector due to the emergence of large number of new banks, every commercial bank should ensure that it operates for profit and at the same time meets the financial demands of its depositors by maintaining adequate liquidity.

Ethiopian banks are situated in an economy with a tight monetary policy and with directives that drains out a huge portion of their liquid resources and channels them into long-term projects. In addition, the raised minimum paid up capital required by banks to operate in the industry reaching to br. 500 million and the new plan informed to banks to set the minimum paid up capital to two billion birr, has led the competition to be stiff where they are all chasing the same market and expose most of the existing banks to face an uphill tasks and puts them in frustration in maintaining the minimum requirement and also operating in the industry (Fortun, 2011).

A study titled “Liquidity Management and Commercial Banks’ Profitability in Nigeria” by Adebayo, Olanrewaju, & Oluwayinka, (2011) found out that there exist a positive relationship between liquidity and profitability. On the contrary, according to Molyneux & Thornton, (1992), and Guru, Staunton, & Balashan, (2000), there is a negative and significant relationship between the level of liquidity and profitability.

(Tseganesh, 2012)Made a study so as to identify determinants of commercial banks liquidity in Ethiopia and then to spot the impact of banks liquidity upon financial performance through the significant variables explaining liquidity. Accordingly, the researcher found out that there exist non-linear relationship between liquidity and bank performance.

In reference to a study conducted by Lily, (2014) to assess the impact of liquidity on profitability of Awash International Bank S.C., it was found out that there is non-linear relationship between liquidity and profitability.

The research conducted in the same area have varying conclusion for proofing does liquidity determines profitability of commercial banks? For some studies there exists a negative relationship between liquidity and profitability Molyneux & Thornton, (1992) and Guru, Staunton, & Balashan, (2000). While for some others Adebayo, Olanrewaju, & Oluwayinka, (2011) there exists a positive relationship between liquidity and profitability. There are also other studies who found out there is non-linear relationship between level of liquidity and banks profitability Tseganesh, (2012) and Lily, (2014). Therefore, this study attempt to investigate this trade-off and what kind of relationship exists between the abovementioned two variables in the context of private commercial banks in Ethiopia.

1.4.Objectives And Hypothesis of the Study

1.4.1. General Objective

The general objective of this study is to answer the question “Does liquidity determine the profitability of private commercial banks in Ethiopia?” in the face of the need to attain both corporate goals of maintaining optimum level of liquidity and profitability as both variables can make its future.

1.4.2. Specific Objectives

The specific objectives of this research are:-

- To evaluate the contribution of liquid asset to total assets ratio on the profitability of the banks
- To express the effect of liquid asset to total deposit ratio on the profitability of the banks
- To examine the effect of loan to total deposit ratio on profitability of the banks and
- To measure the relationships between loan to total assets ratio on profitability of the banks

1.4.3. Hypotheses of the Study

In order to achieve the objective of the study, a number of hypotheses are developed regarding the effects of liquidity on profitability of Ethiopian private commercial banks based on different empirical and theoretical research review made. It is formalized as follows:

HO₁: Liquid Assets to Total Deposit (LA_TD) has a significant positive effect on ROA of banks

HO₂: Loan to Total Deposit (L_TD) has a significant negative effect on ROA of banks

HO₃: Loan to Total Asset (L_TA) has a significant negative effect on ROA of banks

HO₄: Liquid Assets to Total Assets (LA_TA) has a significant positive effect on ROA of banks

1.5. Significant of the Study

The research will identify the technical challenges of private commercial banks in Ethiopia to remain liquid and at the same time profitable. This research will also add to the body of literature to answer the question “Does liquidity determine the profitability of private commercial banks in Ethiopia?”

In addition, it contributes to the banking industry managements since both corporate goals of private commercial banks liquidity and profitability can make or destroy its future. The research will help distinguish empirically, whether firms’ holdings of liquid assets have a significant effect on their profitability. Should this be the case, such basic empirical information is crucial to proper calibration in the context of domestic and international liquidity regulation.

The findings of the study can guide finance managers in banks to make investment decisions that will satisfy the stakeholders’ interest with regard to liquidity and profitability needs of the investors. This in turn contributes to the well being of the financial sector of the economy and the society as a whole. Therefore, bank managements, regulatory bodies, the academic staff and the society as a whole in the country will be beneficiaries from this study with respect to creating more awareness on the sensitivity of liquidity and profitability to the management of commercial banks. The outcome of this study will further assist other researchers in road surface the way for additional studies in the area of the topic under study.

1.6. Scope of the Study

The main aims of this research were to identify the effect of liquidity on profitability of private commercial banks in Ethiopia. Basically it is possible to identify the main factors of profitability

in relation with liquidity by taking liquid asset holdings, level of total asset, level of deposits and volume of loan and advances into consideration. Generally panel data requires large number of observation; to come up with this problem and to know the average position of private commercial banks of ten years (from 2008 -2017) data are collected from eight private commercial banks in the country. Finally, the study employed ROA; as a proxy for dependent variable i.e. profitability.

1.7.Limitation of the study

The main limitation of this study was on data collection from NBE. When comparing the financial statement data provided by NBE officials and published data by individual banks; there were tangible differences. To resolve this problem the researcher collected all financial statement from banks official website.

When calculating different liquidity ratios, identifying the liquid assets, deposits and loan from the financial statements are the very difficult task the researcher faced. This is because the classification of current and noncurrent assets and liabilities are significantly varied from one bank to the other. Thus the ratio values included in this study was presented through detail assessment by the researcher and there may have some in accurate data.

1.8.Organizations of the Paper

The study is organized into five chapters. The first chapter provides background of the study, overview of banking history in Ethiopia, statement of the problems, objectives and hypothesis of the study, significance and scope of the study. In the second chapter, review of literature and empirical studies are covered. The research design and methodology is presented in the third chapter. The fourth chapter deals with analysis, presentation and interpretation of data. The fifth chapter provides summary, conclusion and recommendation based on the study are presented.

CHAPTER TWO

2. LITERATURE REVIEW

2.1.Introduction

This chapter traditionally explored the theoretical foundation on the impact of liquidity on profitability of commercial banking institutions. It also seeks to identify and analyze models on the subject found in journals, previous finance researches papers, textbooks by several authors, internet and other professional's magazines.

Liquidity is a measure of a firm's ability to meet its short-term obligations, it is the degree to which an asset or security can be bought or sold in the market without affecting the asset's price. Liquidity is characterized by a high level of trading activity. Profit is the excess of resources earned over resources expended or income less costs. (Macharia, 2013)

Bank liquidity simply means the ability of the bank to maintain sufficient funds to pay for its maturing obligations. It is the bank's ability to immediately meet cash, cheque, other withdrawals obligations and legitimate new loan demand while abiding by existing reserve requirements. (Workineh, 2016)

The Basel Banking Supervision Committee defines liquidity as an entity's capacity to finance increases in its volume of assets and to comply with its payment obligations on maturity, without incurring unacceptable losses. In this regard, A bank should identify, measure, monitor and control a bank's liquidity risk positions for: future cash flows of assets and liabilities; sources of contingent liquidity demand and related triggers associated with off balance sheet positions; currencies in which a bank is active; and correspondent, custody and settlement activities.(CH-4002 Basel, September 2008)

2.2.Theoretical Review on Liquidity

Efficient and effective liquidity management is crucial if the survival and prosperity of small firms is to be ensured. Liquidity refers to the level of cash and near-cash assets held, as well as cash inflows and outflows of these assets. (Botoe, 2012)

As uncertainty led funding sources to evaporate, many banks quickly found themselves short on cash to cover their obligations as they came due. In extreme cases, banks in some countries failed or were forced into mergers. As a result, in the interest of broader financial stability, substantial

amounts of liquidity were provided by authorities in many countries, including Canada and the United States. Since liquid assets such as cash and government securities generally have a relatively low return, holding them imposes an opportunity cost on a bank. In the absence of regulation, it is reasonable to expect banks will hold liquid assets to the extent they help to maximize the firm's profitability. Beyond this, policymakers have the option to require larger holdings of liquid assets, for instance, if it is seen as a benefit to the stability of the overall financial system. While regulation can make the financial system more resilient to liquidity shocks, calibration should recognize any associated costs to the efficiency of financial intermediation as this could result in higher borrowing costs for other agents in the system. (Wambu, 2013)

(Acharya & Naqvi, 2011) developed a theory of banking explaining how the seeds of a crisis may be sown when banks are flush with liquidity. The main empirical implication of their model is that excessive liquidity induces risk-taking behavior on the part of bank managers. As a result, they note that bank managers will behave in an overly-aggressive manner by mispricing risk when bank liquidity is sufficiently high; asset price bubbles are formed for high enough bank liquidity; bubbles are more likely to be formed when the underlying macroeconomic risk is high inducing investors to save with banks rather than make direct entrepreneurial investments; and, also bubbles are more likely to be formed following loose monetary policies adopted by the central bank.

The Central Bank can avoid the emergence of bubbles by adopting a contractionary monetary policy at times when banks are awash with liquidity by drawing out their reserves (Schilling, 2006). Some proponents, most notably Greenspan (1997), have argued that "we are never certain where we are in the cycle and hence monetary policy should not be used to target asset prices. Nevertheless (Acharya & Naqvi, 2011) model showed that even in the absence of precise knowledge of macroeconomic fundamentals a 'leaning against the wind policy' can be rationalized. Thus they closed their argument by saying that monetary policy should target not just interest rates and employment but also asset prices.

2.2.1. Quantitative Liquidity Theories

(William, 1952) and (Marton & Daniel, 1966) model which recognized the dynamics of cash flows are some of the earlier research efforts attempted to develop models for optimal liquidity and cash balances, given the organization's cash flows the focus was on using quantitative

models that weighed the benefits and costs of holding cash (liquidity). These earlier models help financial managers understand the problem of cash management, but they rest on assumptions that do not hold in practice. The trade-off model postulates that firms identify their optimal level of cash holdings by weighting the marginal costs and marginal benefits of holding cash. The benefits related to cash holdings are: reduces the likelihood of financial distress, allows the pursuance of investment policy when financial constraints are met, and minimizes the costs of raising external funds or liquidating existing assets. The main cost of holding cash is the opportunity cost of the capital invested in liquid assets. A firm that currently pays dividends can raise funds at low cost by reducing its dividend payments, in contrast to a firm that does not pay dividends. Firms will trade-off holding cash and investing it depending on its investment needs.

(Marton & Daniel, 1966) model of demand for money by firms suggests that there are economies of scale in cash management. This would lead larger firms to hold less cash than smaller firms. Also, it is argued that the fees incurred in obtaining funds through borrowing are uncorrelated with the size of the loan, indicating that such fees are a fixed amount. Thus, raising funds is relatively more expensive to smaller firms encouraging them to hold more cash than larger firms. Firms with more volatile cash flows face a higher probability of experiencing cash shortages due to unexpected cash flow deterioration. Thus, cash flow uncertainty should be positively related with cash holdings.

2.2.2. Liquidity Motive Theories

The economics and finance literature analyze possible reasons for firms to hold liquid assets. Keynes, (1935) Identified different motives on why people demand and prefer liquidity. The transaction motive, here firms hold cash in order to satisfy the cash inflow and cash outflow needs that they have. Cash is held to carry out transactions and demand for liquidity is for transactional motive. The demand for cash is affected by the size of the income, time gaps between the receipts of the income, and the spending patterns of the cash available. The precautionary motive of holding cash serves as an emergency fund for a firm. If expected cash inflows are not received as expected cash held on a precautionary basis could be used to satisfy short-term obligations that the cash inflow may have been bench marked for. Speculative reason for holding cash is creating the ability for a firm to take advantage of special opportunities that if acted upon quickly will favor the firm.

According to (Almeida, 2002) proposed a theory of corporate liquidity demand that is based on the assumption that choices regarding liquidity will depend on firms' access to capital markets and the importance of future investments to the firms. The model predicts that financially constrained firms will save a positive fraction of incremental cash flows, while unconstrained firms will not. Empirical evidence confirms that firms classified as financially constrained save a positive fraction of their cash flows, while firms classified as unconstrained do not. The cost incurred in a cash shortage is higher for firms with a larger investment opportunity set due to the expected losses that result from giving up valuable investment opportunities. Therefore, it is expected a positive relation between investment opportunity and cash holdings. The theory also predicts that firms with better investment opportunities have greater financial distress costs because the positive Net Present Value (NPV) of these investments disappears (almost entirely) in case of bankruptcy. In this case, firms with better investment opportunities will keep higher levels of cash to avoid financial distress. To the extent that liquid assets other than cash can be liquidated in the event of a cash shortage, they can be seen as substitutes for cash holdings. Consequently, firms with more liquid asset substitutes are expected to hold less cash. It is generally accepted that leverage increases the probability of bankruptcy due to the pressure that rigid amortization plans put on the firm treasury management. To reduce the probability of experiencing financial distress, firms with higher leverage are expected to hold more cash. On the other hand, to the extent that leverage ratio acts as a proxy for the ability of the firms to issue debt it would be expected that firms with higher leverage (higher ability to raise debt) hold less cash. Thus, the predicted relationship between cash holdings and leverage is ambiguous.

2.2.3. The Financial Fragility Theory

According to (Diamond & Rajan, 2001) model a relationship bank that raises fund from investors to provide financing to an entrepreneur. The entrepreneur may withhold effort, which reduces the amount of bank financing attainable. More importantly, the bank may also withhold effort, which limits the bank's ability to raise financing. A deposit contract mitigates the bank's holdup problem – because depositors can run on the bank if the bank threatens to withhold effort – and therefore maximizes liquidity creation. Providers of capital cannot run on the bank, which limits their willingness to provide funds, and hence reduces liquidity creation. Thus, the higher a bank's capital ratio, the less liquidity it will create.

According to (Diamond & Rajan, 2001) argument that the ability of uninsured depositors to run on the bank in the event of expected wealth expropriation by bank managers is an important

disciplining mechanism. A related idea is proposed by Flannery, (1998) who provides a rationale for maturity mismatching that does not focus on liquidity creation. Flannery's model focuses on the disciplining effect of depositors' ability to withdraw funds on demand, and thus prevent the bank from expropriating depositor wealth through excessively risky investments. (Gorton & Winton, 2000) Show how a higher capital ratio may reduce liquidity creation through the crowding out of deposits. They argue that deposits are more effective liquidity hedges for investors than investments in bank equity capital. Thus, higher capital ratios shift investors' funds from relatively liquid bank deposits to relatively illiquid bank capital, reducing overall liquidity for investors.

2.2.4. The Risk Absorption Theory

According to (Berger & Bouwman, 2010) this insight is based on two strands of the literature that is the risk absorption theory predicts that higher capital enhances the ability of banks to create liquidity Allen & Gale, (2004) and the other is bank capital allows the bank to absorb greater risk (Repullo, 2002). The standard view of liquidity creation is that banks create liquidity by transforming illiquid assets into liquid liabilities. (Diamond & Rajan, 2001) and (Gorton & Winton, 2000) show, however, that banks can create more or less liquidity by simply changing their funding mix on the liability side. (Thakor, Mar 1996) shows that capital may also affect banks' asset portfolio composition, thereby affecting liquidity creation through a change in the asset mix. (Berger & Bouwman, 2010) measures of liquidity creation incorporated these insights; they explicitly recognize that liquidity creation by banks occurs through changes in the mixes on both sides of the balance sheet as well as off-balance sheet activities.

2.2.5. Banks Liquidity Management Theory

The major objective of a commercial bank is to create liquidity while remaining financially sound. However, there are a number of dimensions in the way banks concretely manage their liquidity risk. In plain words, there are competing liquidity management theories. Liquidity management theories encompass where it is exactly performed in the organization, how liquidity is measured and monitored, and the measures that banks can take to prevent or tackle a liquidity shortage. These competing theories include: Commercial Loan Theory, Shift ability Theory and Anticipated Theory. (Botoe, 2012)

2.2.5.1. Commercial Loan (Traditional) Theory and Liquidity

The real bills doctrine or the commercial loan theory states that a commercial bank should advance only short-term self-liquidating productive loans to business firms. Self-liquidating loans are those which are meant to finance the production, and movement of goods through the successive stages of production, storage, transportation, and distribution. (Meghana, 2017)

(Smith, 1776) provided the first systematic exposition of the doctrine in his *Wealth of Nations*. Basically, it is a theory of asset management that emphasized liquidity; the doctrine held that banks should restrict their earning assets to “real” bills of exchange and short-term, self-liquidating advances for commercial purposes. In this way, it was argued; individual banking institutions could maintain the liquidity necessary to meet the requirements of deposit withdrawals on demand. Under a somewhat modified character this basic doctrine came to be known in the U. S. as the commercial loan theory of credit.

The commercial loan theory of credit became obsolete both because of its conceptual flaws and its impracticality. A critical underlying assumption of the theory held that short-term commercial loans were desirable because they would be repaid with income resulting from the commercial transaction financed by the loan. It was realized that this assumption would certainly not hold during a general financial crisis even if bank loan portfolios did conform to theoretical standards, for in most commercial transactions the purchaser of goods sold by the original borrower had to depend to a significant extent on bank credit. Without continued general credit availability, therefore, even short-term loans backing transactions involving real goods would turn illiquid. Rigid adherence to the orthodox doctrine was, furthermore, a practical impossibility if banks were to play a role in the nation’s economic development (Casu, Claudia, & Philip, 2006).

2.2.5.2. The Shift ability Theory of Liquidity

The shift-ability theory of bank liquidity was propounded by H.G. Moulton who asserted that if the commercial banks maintain a substantial amount of assets that can be shifted on to the other banks for cash without material loss in case of necessity, then there is no need to rely on maturities. According to this view, an asset to be perfectly shift-able must be immediately transferable without capital loss when the need for liquidity arises. (Meghana, 2017)

A major defect in the shift-ability theory was discovered similar to the one that led to the abandonment of the commercial loan theory of credit, namely that in times of general crisis the

effectiveness of secondary reserve assets as a source of liquidity vanishes for lack of a market (Casu, Claudia, & Philip, 2006).

The role of the central bank as lender of last resort gained new prominence, and ultimately liquidity was perceived to rest outside the banking system. Furthermore, the soundness of the banking system came to be identified more closely with the state of health of the rest of the economy, since business conditions had a direct influence on the cash flows, and thus the repayment capabilities, of bank borrowers. The shift-ability theory survived these realizations under a modified form that included the idea of ultimate liquidity in bank loans resting with shift-ability to the Federal Reserve Banks. Under this institutional scheme, the liquidity concerns of banks were partially returned to the loan portfolio, where maintenance of quality assets that could meet the test of intrinsic soundness was paramount (Allen & Gale, 2004).

2.2.5.3. Anticipated Income Theory of Liquidity

The doctrine of anticipated income, as formalized by Herbert , (1949) embodied these ideas and equated intrinsic soundness of term loans, which were of growing importance, with appropriate repayment schedules adapted to the anticipated income or cash flow of the borrower.

The credit demands of business were well accommodated under this system of banking policy, and the use of loan commitments was freely pursued. Changing economic conditions, however, placed extra demands on the banking system that resulted in a new approach to balance sheet management, and businesses faced new financial challenges. Under this emerging state of affairs, bank loan commitment policies would come to play a more important part in the credit process.(Meghana, 2017)

2.2.6. Liquidity Measurement in Commercial Banks

Practically, liquidity management in commercial banks is surrounding both size of the prospective needs for liquidity at any given time and the availability of sources of liquidity sufficient to meet them. The importance of accurate liquidity measurement cannot be overstressed as it reveals the liquidity positions of the banks through which the operators of the financial market and other creditors adjudged the credit worthiness of the banks. Liquidity can be measured as a stock or as a flow. From the stock perspective, liquidity management requires an appraisal of holdings of assets that may be turned into cash. The determination of liquidity adequacy within this framework requires a comparison of holding of liquid assets with expected liquidity needs. Stock concept of liquidity management has been criticized as being too narrow

in scope. The flow concept of liquidity measurement views liquidity not only as the ability to convert liquid assets into cash but also the ability of the economic units to borrow and generate cash from operators. This approach recognizes the difficulty involved in determining liquidity standards since future demands are not known. It also recommends accurate forecast of cash needs and expected level of liquid assets and cash receipts over a given period of time for there to be a realistic appraisal of a bank's liquidity position.

Between the two concepts, the stock concept is the widely used and involving the application of financial ratios in the measurement of liquidity positions of commercial banks. One of the popular financial ratios used in such measurement is liquidity ratios which measures the ability of the bank to meet its current obligations. The liquidity ratios are composed of current ratio and quick ratio. Current ratio is a measure of a commercial bank's short term solvency and is calculated by dividing current assets by current liabilities incurred. The current assets are composed of cash and those assets which can be converted into cash in a short period which include marketable securities, receivables, inventories, and prepaid expenses. Current liabilities consist of all obligations maturing within a year. They include accounts payable, bills payable, note payable, accrued expenses and tax liability. A current ratio that is greater than one is adjudged satisfactory for most business firms even though it is difficult to authoritatively set one standard for all firms. The problem associated with the measure of liquidity with current ratio is that it is the test of quantity and not quality of the assets and hence, it does not reveal the true position of a firm's liquidity. Current ratio gives a rough idea of the firm's liquidity. Another aspect of liquidity ratio is quick ratio, which indicates the relationship between liquid assets and current liabilities. Quick ratio is calculated by dividing the quick asset (current asset less inventories) by current liabilities. The quick assets are the assets that can be converted into cash immediately without losing their values. Inventories are subtracted from the current assets because they normally require some time for realizing cash and their value has a tendency to fluctuate. Quick ratio is considered to be a better guide to the short-term solvency of a firm. A quick ratio is considered to represent a satisfactory current financial condition. However, each industry has its own operating characteristics which demands different financial standards. Other ratios which have been developed to measure liquidity are liquid assets to total assets; liquid assets to total deposits; loans and advances to deposits and loans and advances to total asset. Calculating the ratio of liquid assets to total assets explains the importance of a bank's liquid assets among its total assets. It indicates the proportion of a bank's total assets that can be

converted into cash at a short notice. The ratio of liquid assets to total deposits shows what percentage of a bank's deposits is held in liquid form. It relates liquid assets directly to deposit level.

The ratio of loan and advances to deposits reflects the quantity or proportion of the customers' deposits that has been given out in form of loans and the percentage that is retained in the liquid forms. The ratio serves as a useful planning and control tool in liquidity management since commercial banks use it as a guide in lending and investment, and to make a total evaluation of their expansion program. When the ratio rises to relatively high level, banks are encouraged to lend and invest and vice versa, to take some benefit of profitability. Cash ratio i.e. ratio of cash to total deposits or assets is another measure of bank liquidity. Its advantage over others is that liquid assets are related directly to deposits rather than to loans and advances that constitute the most illiquid of banks assets. Its drawback is that a substantial part of the cash assets is not really available to meet most liquidity assets. According to (Obilor, 2013), another measure of bank liquidity is the loan to liabilities ratio. The approach recognizes that liabilities other than deposits ratio represent potential drain on bank funds. According to State Bank of Pakistan category, all the above mentioned ratios and measures are classified in the following manner:

- i. **Cash Flow Ratios and Limits.** One of the most serious sources of liquidity risk comes from a bank's failure to "roll over" a maturing liability. Cash flow ratios and limits attempt to measure and control the volume of liabilities maturing during a specified period of time.
- ii. **Liability Concentration Ratios and Limits.** Liability concentration ratios and limits help to prevent a bank from relying on too few providers or funding sources. Limits are usually expressed as either a percentage of liquid assets or an absolute amount. Sometimes they are more indirectly expressed as a percentage of deposits, purchased funds, or total liabilities.
- iii. **Other Balance Sheet Ratios.** Total loans/total deposits, total loans/total equity capital, borrowed funds/total assets etc are examples of common ratios used by financial institutions to monitor current and potential funding levels.

As per NBE's lastly replacement liquidity requirement directives No. SBB/57/2014, "liquid assets" includes cash, deposits with the National Bank and other local and foreign banks having acceptance by the National Bank, other assets readily 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), deposits with the National Bank Ethiopia and other local and foreign banks having acceptance by the National Bank and treasury bills.

2.3. Concept of Profitability

According to (Harward & Upton, 1991) profitability is the ability of a given investment to earn a return from its use. Profitability means ability to make profit from all the business activities of an organization, company, firm, or an enterprise. It shows how efficiently the banks management can make profit by using all the resources available in the market. However, the term 'Profitability' is not substitutable for the term 'Efficiency'. Profitability is an index of efficiency; and is regarded as a measure of efficiency and management guide to greater efficiency. Though, profitability is an important yardstick for measuring the efficiency, the extent of profitability cannot be taken as a final proof of efficiency. Sometimes satisfactory profits can mark inefficiency and conversely, a proper degree of efficiency can be accompanied by an absence of profit. The net profit figure simply reveals a satisfactory balance between the values receive and value given. The change in operational efficiency is merely one of the factors on which profitability of an enterprise largely depends. Moreover, there are many other factors besides efficiency, which affect the profitability.

2.3.1. Determinants of Financial Performance

Financial measures are considered the most used parameter of business performance measurement, especially in the current economic climate. Most growing businesses ultimately target increased profits, so it is important to know how to measure profitability. The key standard measures are:-

Solvency measures the amount of borrowed capital used by the business relative to the amount of owner's equity capital invested in the business. In other words, solvency measures provide an indication of the business' ability to repay all indebtedness if all of the assets were sold. Solvency measures also provide an indication of the business' ability to withstand risks by providing information about the firm's ability to continue operating after a major financial adversity (Hammes & Chen, 1998-2002). Unlike liquidity, solvency is concerned with long-term as well as short-term assets and liabilities. Three widely used financial ratios to measure

solvency are the debt-to-asset ratio, the equity-to-asset ratio and the debt-to-equity ratio. These three solvency ratios provide equivalent information, so the best choice is strictly a matter of personal preference. The debt-to-asset ratio expresses total firm liabilities as a proportion of total firm assets and the higher the ratio, the greater the risk exposure of the firm. The equity-to-asset ratio expresses the proportion of total assets financed by the owner's equity. The debt-to-equity ratio reflects the capital structure of the firm and the extent to which firm debt capital is being combined with firm equity capital. It is a measure of the degree to which a firm is leveraging its equity.

Profitability measures the extent to which a business generates a profit from the factors of production: labor, management and capital. Profitability is the most important measure of success of the business. A business that is not profitable cannot survive, yet a highly profitable one has the ability to reward its owners with a large return on their investment. Profitability analysis focuses on the relationship between revenues and expenses and on the level of profits relative to the size of investment in the business (Mesquita & Lara, 2003). Four useful measures of firm profitability are the rate of return on firm assets (ROA), the rate of return on firm equity (ROE), operating profit margin and net firm income. The ROA measures the return to all firm assets and is often used as an overall index of profitability, and the higher the value, the more profitable the firm business. The ROE measures the rate of return on the owner's equity employed in the firm business. It is useful to consider the ROE in relation to ROA to determine if the firm is making a profitable return on their borrowed money (Hadlock & James, 2002). Net firm income comes directly off the income statement and is calculated by matching firm revenues with the expenses incurred to create those revenues, plus the gain or loss on the sale of firm capital assets. Net firm income represents the return to the owner for unpaid operator and family labor, management and owner's equity. Like working capital, net firm income is an absolute dollar amount and not a ratio, thus comparisons to other firms is difficult because of firm size differences (DeLoof & Jeger, 1996).

On their part, (Bernard, Victor, Paul, Healy, & Palepu, 1996) asserted that "the starting point for a systematic analysis of a firm's performance is its return on equity (ROE) as well as return on assets (ROA). Return on assets (ROA) is an important determinant from ROE because it shows how much profit a company is able to generate for each dollar of assets invested (Bernard, Victor, Paul, Healy, & Palepu, 1996). Although ROE and ROA are commonly used to assess the performance of large companies, research into SMEs performance has tended to focus on sales

or profit, or growth in sales or profit (Fasci & Valdez, 1998). While there is no doubting the importance of sales and profit to a business, it is equally important to relate these output measures to measures of inputs (namely assets or equity) when making comparisons of business performance.

2.3.2. Measure of Bank Performance

a) Net Operating Income (NOI)

Net operating income is computed by subtracting the operating expenses from the operating income of the Bank. It is closely watched by bank managers, bank shareholders, and bank regulators because it indicates how well the bank is doing on an ongoing basis. Net income, usually referred to as profits after taxes, is the figure that tells us most directly how well the bank is doing because it is the amount that the bank has available to keep as retained earnings or to pay out to stockholders as dividends.

b) Return on Asset (ROA)

The return on assets ratio, often called the return on total assets, is a profitability ratio that measures the net income produced by total assets during a period by comparing net income to the average total assets. ROA is a basic measure of bank's profitability that corrects for the size of a bank. In other words, the return on assets ratio measures how efficiently a bank can manage its assets to produce profits during a period. Since company assets' sole purpose is to generate revenues and produce profits, this ratio helps management see how well the company can convert its investments in assets into profits.

c) Return on Equity (ROE)

This ratio indicates how profitable a bank is by comparing its net income to its average shareholders' equity. The return on equity ratio (ROE) measures how much the shareholders earned for their investment in the bank. The higher the ratio percentage, the more efficient management is in utilizing its equity base and the better return is to investors.

d) Net Interest Margin (NIM)

Net interest margin (NIM) is a measure of the difference between the interest income generated by banks or other financial institutions and the amount of interest paid out to their lenders (for example, deposits), relative to the amount of their (interest-earning) assets.

It is a performance metric that examines how successful a bank's investment decisions are compared to its debt situations. A negative value denotes that the firm did not make an optimal decision, because interest expenses were greater than the amount of returns generated by investments.

Although net income gives an idea of how well a bank is doing, it suffers from one major drawback: It does not adjust for the bank's size, thus making it hard to compare how well one bank is doing relative to another or at various levels of asset position. Return on Equity on the other hand is concerned about how much the bank is earning on owners equity investment instead of earning assets. In addition to this, the major weakness of Net Interest Margin as a measure of profitability is that it focuses only on income related to interest by disregarding other forms of income like fees, commissions and others. In general, the aforementioned measurements fail to show the overall performance of a bank. Therefore, for this specific study, the researcher preferred to use ROA as measures of bank performance due to the above mentioned reasons.

2.3.3. The Relevance of Liquidity and Profitability to Commercial Banks

Liquidity term of a commercial bank's balance sheet has two interpretations. It refers firstly to the ability of the bank to honor the claims of the depositors. And secondly, it shows the ability of the bank to convert its non-cash assets into cash easily and without loss (Sunders & Cornett, 2004). Commercial bank should always have enough cash to meet the demands of the depositors. Significantly, the success of a commercial bank depends to a greater extent upon the degree of confidence it can instill in the minds of its funds owners. If the fund owners lose confidence in the ability of their bank to repay depositors, the very existence of the bank will be at stake. So, the bank should always be prepared to meet the claims of the depositors by having enough cash. Among the various items on the assets side of the balance sheet, cash on hand represents the most liquid asset followed by cash with other banks and the central bank. Liquidity also refers to the ability of the commercial bank to convert its non-cash assets into cash easily and without loss. The bank cannot have all its assets in the form of cash because cash is an idle asset which does not fetch any return to the commercial bank. So some of the assets of the bank, money at call and short notice, bills discounted, etc. could be made liquid easily and without loss (Saunders, Cornett, & Marcia, 2004).

2.4.Review of Related Empirical Studies:

2.4.1. Empirical Study in the World:

(Bourke, 1989) carried out a study to establish the relationship between liquid assets and bank profitability for 90 banks in Europe, North America and Australia from 1972 to 1981, the study used econometric framework presented in an equation. The dependent variable, profitability, was regressed against a non-linear expression of relative liquid asset holdings, as well as a set of control variables. Liquid assets were generally included as a control variable in this study with very limited discussion around the estimated parameter. From the study a company with low liquidity and high profitability has to increase its borrowing leading to an increase of the financial costs. This would certainly lead to increasing interest rates, since the cheaper sources are quickly exhausted. Furthermore, having increased its debt, the company raises its credit risk, causing an increase in interest rates charged by their financiers. Under these conditions, the company has to get more time from suppliers, resulting in the acquisition of raw materials at higher prices. Also it will fail to achieve financial discounts offered by the anticipation of payments and incur interest and penalties for late payments the liquidity problems would become even worse. The study emphasized that profitability and solvency are necessary condition for the healthy existence of the company and both are conditioned by the strategy adopted in the medium and long term.

(Berger A. , 1995) analyzed the statistical relationships between bank earnings and capital for 50 U.S. banks over the period of 1983-1989 using multiple regression analysis and found that, contrary to what one might expect in situations of perfect capital markets with symmetric information there is a positive relationship between capital and return on equity. This result, according to the author, is consistent with the “expected bankruptcy cost hypothesis.” More specifically, Berger’s results suggest that banks with higher levels of capital see their funding costs decrease to such an extent that it more than offsets the cost of issuing additional capital. While Berger applies the concept of the “expected bankruptcy cost hypothesis” in the realm of capital, it is also conceptually applicable to the impact of liquid assets on profitability, whereby banks holding more liquid assets benefit from a superior perception in funding markets, reducing their financing costs and increasing profitability.

(Bordeleau, Crawford, & Graham, 2009) reviewed the impact of liquidity on bank profitability for 55 US banks and 10 Canadian banks between the period of 1997 and 2009. The study

employed quantitative measures to assess the impact of liquidity on bank profitability. Results from the study suggested that a nonlinear relationship exists, whereby profitability is improved for banks that hold some liquid assets, however, there is a point beyond which holding further liquid assets diminishes a banks' profitability, all else equal. Conceptually, this result is consistent with the idea that funding markets reward a bank, to some extent, for holding liquid assets, thereby reducing its liquidity risk. However, this benefit can eventually be outweighed by the opportunity cost of holding such comparatively low yielding liquid assets on the balance sheet. At the same time, estimation results provided some evidence that the relationship between liquid assets and profitability depended on the bank's business model and the risk of funding market difficulties. Adopting a more traditional i.e. deposit and loan based business model allows a bank to optimize profits with a lower level of liquid assets. Likewise, when the likelihood of funding market difficulties is low, banks need to hold less liquid assets to optimize profits. The empirical results presented in this paper were in line with similar concepts in the broader literature related to capital, credit risk and international reserves.

According to (Etienne & Christopher, 1998) the impact of liquid asset holdings on bank profitability for a sample of large U.S. and Canadian banks. Results suggest that profitability is improved for banks that hold some liquid assets, however, there is a point at which holding further liquid assets diminishes a banks' profitability, all else equal. These results are particularly relevant as policymakers devise new standards establishing an appropriate level of liquidity for banks. While it is generally agreed upon that banks undervalued liquidity prior to the recent financial crisis, one must also consider the tradeoff between resilience to liquidity shocks and the cost of holding lower-yielding liquid assets as the latter may impact banks' ability to generate revenues, increase capital and extend credit.

2.4.2. Empirical Study in Africa

A study titled "Liquidity Management and Commercial Banks' Profitability in Nigeria" by (Adebayo, Olanrewaju, & Oluwayinka, 2011) found out that there exist a positive relationship between liquidity and profitability. According to the researchers finding, profitability will be optimized only when liquidity is effectively and efficiently managed i.e. when the commercial bank is able to meet its financial obligations and at the same time maximizes its profits. A situation where the commercial banks maintain more than the required liquidity level, the result will be huge stock or idle stock of fund in the vault at the expense of profitability. The

researchers relied on primary data and used questionnaire as their source of data. In the mean time, correlation was used as a method of analysis for the study.

(Owolabi, Obiakor, & Okwu, 2011) conducted a study that investigated the relationship between liquidity and profitability in 15 selected quoted companies in Nigeria. The central objective was to examine the nature and extent of the relationship between liquidity and profitability in profit-driven quoted companies and also to determine whether any cause and effect relationship existed between the two performance measures. Liquidity measure considered was current assets-liabilities ratio while profitability measure was operating profit-turnover ratio. Investigative and quantitative analysis methods were used for the study. Analysis was based on data extracted from annual reports and accounts of the companies for the relevant period. Correlation and regression analysis respectively were employed to examine the nature and extent of the relationship between the variables and determine whether any cause and effect relationship between them. A model of perceived functional relationship was specified, estimated and evaluated. The results showed that while a trade-off existed between liquidity and profitability in the banking company, the two variables were positively correlated and also reinforced each other in the other companies.

(Loo, 2007) conducted a survey of liquidity management approaches and their effect of profitability of commercial banks in Kenya. The survey was conducted on all commercial banks operating in Kenya between the periods 1997 to 2004 and used questionnaires to top finance management staff to identify liquidity management approaches. The study found that profitability was one of the factors that affected a firm's liquidity management policy. From the study there was a positive correlation between liquidity and profit levels in the banks.

(Mureithi, 2003) carried out an empirical investigation into the determinants of corporate cash holding for the Kenyan quoted companies. The study involved 29 companies quoted at the Nairobi Securities exchange (NSE) over a period of 10 years. The study used descriptive and quantitative statistics; he observed that one of the factors affecting corporate cash holding is the profitability of the entity. He observed that profitability convey to the market credit worthiness and growth prospects of the firm. From the study there was positive relationship between profitability and liquidity.

(Njihia, 2003) in a study to identify determinants of commercial banks profitability in Kenya identified liquidity as one of the factors affecting profitability. The study involved 35 commercial banks operating in Kenya over a period of 5 years. The study employed descriptive

statistics and multiple regression analysis to estimate the determinants of commercial banks profitability. The study concluded that in one of the years under study liquid assets significantly determined the profit of the commercial banks especially in the period after political instability after the elections. The ratio of deposits held, loans and advances held by the commercial banks influenced the profitability.

(Kamoyo, 2006) carried out an empirical study on the determinants of liquidity of commercial banks in Kenya. The study involved 30 commercial banks operating in Kenya in the period 1995 to 2004. The study applied descriptive statistics, investigative questionnaires and multiple regression analysis to establish the determinants of liquidity in commercial banks. The results of the study indicated an insignificant negative relationship between profitability and liquidity.

2.4.3. Empirical Study in Ethiopia

Some related studies were conducted by different researchers in Ethiopia. Specifically, Dereje, (2014), made an exploratory study titled assessment of liquidity risk management practices at Wegagen Bank.

The researcher used questionnaires, interview and annual audited reports and identified that the Bank has been trying to establish independently organized liquidity risk management functions and established Asset Liability Management Committee and put in place policies and limits though they are not effective in dealing with liquidity risks.

Despite the Bank has a problem in monitoring and controlling liquidity position in light of the existing policies and limits, weak management information system and there exist concentration risk of funding sources. Another study conducted by Lily, (2014) to assess the impact of liquidity on profitability of Awash International Bank S.C. with the use of quantitative method particularly descriptive design and a time series data retrieved from the balance sheet and income statements during 1995-2013 were analyzed using multiple regression. The results of the multiple regression indicated that liquidity has non-linear relationship on profitability.

The study conducted by Semu, (2006) intended to assess impact of liquidity on profitability of private commercial banks – the case of NIB International Bank S.C. It also attempts to examine the possible factors that compel the banks to reduce or restrict lending. Quantitative method particularly survey design approach was adopted for the study. The findings of the study showed that deposit and capital have statistically significant relationship with banks performance measured in terms of return on equity (ROE). New loan and liquidity have relationship with

banks performance measured in terms of both ROA and ROE. However, the relationship was found to be statistically insignificant. Deposit and capital have no statistically significant relationship with banks performance in terms of ROA. The study suggested that when banks face lending constraints, they have to use their funds like by purchasing treasury bills and bonds. Moreover, banks must develop non-interest generating services. Excess cash maintained by banks should be used by diversifying credit options and to avoid inefficiencies.

The study conducted by Sirak, (2006) intended to investigate the impact of liquidity on profitability of Nib International Bank S.C. Both qualitative and quantitative data were used to address the objective of the study. The time series data taken from the audited financial statements of the Bank, particularly balance sheet and income statements during 1999-2015 were analyzed using multiple regressions.(Sirak, 2006) Showed the regression model indicated that Liquidity ratio, NBE Bills and inflation rate had significant positive impact on profitability. However, loan to deposit ratio and deposit interest rate had an inverse relation with insignificant impact on profitability of Nib International Bank. In addition, the existing liquidity measurement tools were found out to be applicable and effective in terms of liquidity measurement and management. Finally, the study concluded that the impact of liquidity on profitability of Nib International Bank was positive and significant.

2.5.Research Gaps

From the foregoing review of relevant literature, it is evident that research in the area of determinants of bank liquidity on profitability of commercial banks has been done but it is not enough to answer the question “Does liquidity determine profitability of privet commercial banks in Ethiopia?”All the literature reviewed indicates that previous researchers only concentrated on determinants of bank liquidity while this study focus on to answer the question liquidity determine profitability’s of privet commercial banks in Ethiopia. This study therefore intends to fill these pertinent gaps in literature by answering the above question on selected key performance indicators of privet commercial banks in Ethiopia.

To the knowledge of the researcher this paper is different from other previous researches by considering sample size and time period. So that it enables to fulfill the gap of other researches in the banking industry.

2.6. Conceptual Framework

The conceptual framework which describes the relationship between liquidity and profitability based on the theoretical and empirical perspectives was formulated as follows:

Dependent variables

Return on assets (ROA) = Net Income After Tax/ Total Assets

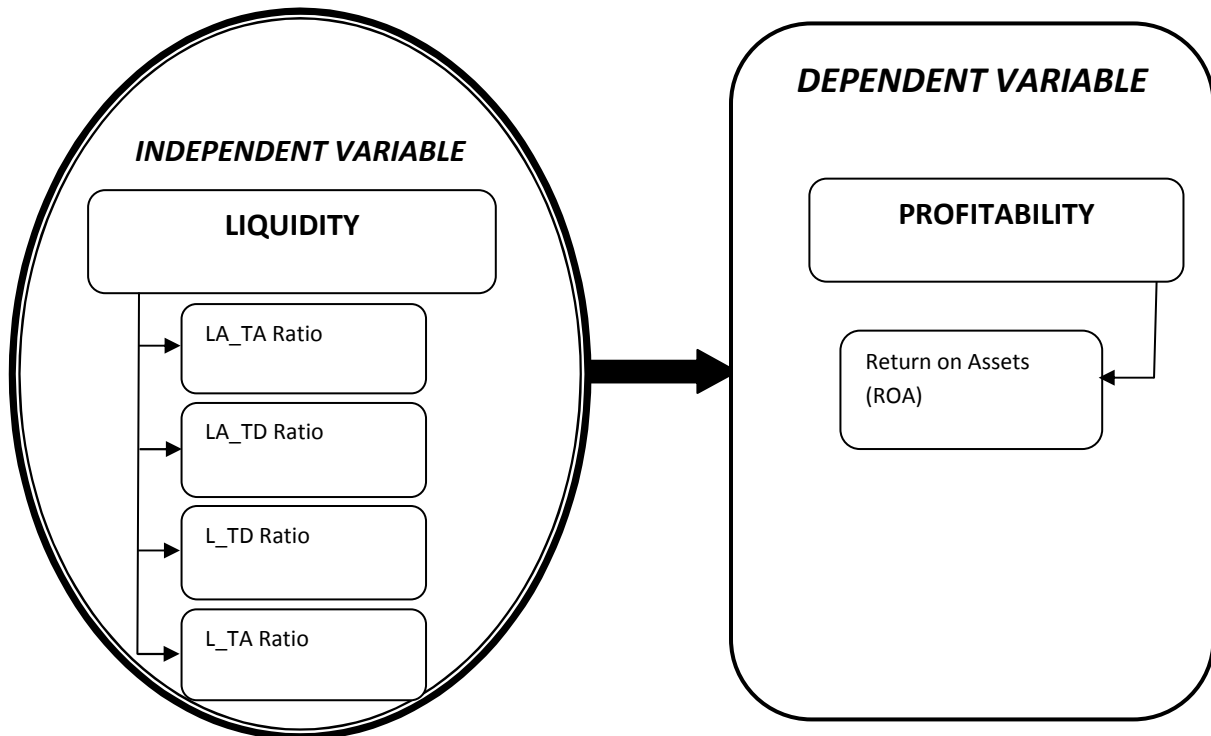
Independent variables

Liquid Assets to Total Assets Ratio (LA_TA) = Liquid Assets / Total Assets

Liquid Assets to Total Deposit Ratio (LA_TD) = Liquid Assets / Total Deposit

Loan to Total Deposit Ratio (L_TD) = Loans / Total Deposit

Loan to Total Assets Ratio (L_TA) = Loans / Total Assets



Source: Own drawing

CHAPTER THREE

3. METHODOLOGY

The literature review and empirical study section of the study has attempted to discuss the theories in relation to liquidity and profitability and also the knowledge gap. The purpose of this chapter is to present the research approach adopted by the study. The chapter is organized as follows. Section 3.1 presents the research design adopted by the study. Section 3.2 presents the research approach adopted by the study. The population and sampling design for the study explained in section 3.3. Then, data collection, analysis and presentation techniques were explained under section 3.4. The regression model (model specification) for the study was discussed under section 3.5 and finally variable Description, measurements and research hypotheses was discussed under section 3.6

3.1. Research Design

The research design sets the conceptual structure with in which a study is conducted. It constitutes the blue print for collection, measuring, presentation and analysis of data collected. According to Samuel, (2016) research design helps the researcher organize his ideas in a form whereby it will be possible for him to look for flaws and inadequacies.

The impact level of liquidity on profitability can be measured by assessing important variables between two or more points at a time. This can be accomplished by collecting data from more than one point in time and study the relationships between dependent & independent variables (Saunders, Cornett, & Marcia, 2004). Thus, the design that best fits this study was found to be an explanatory design and was used by the researcher.

3.2. Research Approach Adopted

In the investigative study there are three common approaches to business and social research namely, quantitative, qualitative and mixed methods approach (Creswell, 2009). Quantitative research is a means for testing objective theories by examining the relationship among variables (Creswell, 2009). It involves counting and measuring of events and performing the statistical analysis of a body of numerical data. On the other hand, qualitative research approach is a means for exploring and understanding the meaning of individuals or groups ascribe to a social or human problem with intent of developing a theory or pattern inductively (Creswell, 2009).

Finally, mixed methods approach is an approach in which the researchers emphasize the research problem and use all approaches available to understand the problem (Creswell, 2009).

Therefore, based on the above discussions in order to achieve the objective of the study this study used quantitative research approach. This approach will allow examining the relationship among the dependent and independent variables and these variables in turn can be measured on instruments and analyzed using statistical procedures (Creswell, 2009).

3.2.1. Quantitative Research Method:

Quantitative research is the systematic empirical investigation of observable phenomena via statistical, mathematical or computational techniques (Creswell, 2009). The objective of quantitative research is to develop and employ mathematical models, theories and/or hypotheses pertaining to phenomena. The process of measurement is central to quantitative research because it provides the fundamental connection between empirical observation and mathematical expression of quantitative relationships. Quantitative data is any data that is in numerical form such as statistics, percentages, etc. The researcher analyzes the data with the help of statistics. The researcher is hoping the numbers will yield an unbiased result that can be generalized to some larger population. Quantitative research is generally made using scientific methods, which can include: The generation of models, theories and hypotheses, the development of instruments and methods for measurement, Experimental control and manipulation of variables, Collection of empirical data and Modeling and analysis of data.

A quantitative strategy is best suited as the research has a large focus on numbers and the use of hypothesis and statistical tools to analyze them. The knowledge that is sought-after has to be measured in order to answer the research problem and the knowledge gap. In this study, this approach enabled to see the relationships between liquidity and profitability of selected private commercial banks in Ethiopia.

A panel data is stand for information across both time and space, and it measures some quantity about them over time (Brooks C. , 2014). One of the merits of using panel data is addressing a broader range of the subject and tackles more complex problems that would be possible with either of pure time-series or pure cross-sectional data. Giving more informative data as it consists of both the cross-sectional information, which captures individual variability, and the time series information, which captures dynamic adjustment is the other advantage (Brooks C. , 2014).

3.3.Population and Sampling Procedure

3.3.1. Target Population and Sample

The target population of this study are; all private commercial banks that are operating in the country during the study period i.e. 2008-2017. In Ethiopia, currently there are sixteen privately owned commercial banks. Eight of them have more than ten years of operation and has a financial statement on the study period stated above.

The sampling technique used in this research to select banks having a longer period so as to get sufficient information was purposive sampling from non-probabilistic sampling methods. As stated by Kothari, (2004), purposive sampling is more desirable when the total population is small and a known characteristic of them is to be studied. The numbers of banks in the country are few; however, adopted balanced panel data needs a large number of observations; thus eight private commercial banks were selected due to the availability of full data for the selected time period. These banks are; NIB International Bank, Awash International Bank, Dashen Bank, Wegagen Bank, United Bank, Lion Bank, Bank of Abyssinia, and Cooperative Bank of Oromia. But the remaining nine banks: Birehan International Bank, Buna International Bank, Addis International Bank, Debub Global Bank, Oromia International Bank, Abay Bank and Enat Bank are not selected as a sample; because they were less than ten years in operation. Thus; it is possible to draw a relationship among variables using 80 observations (8 banks x 10 year's data).

3.4.Data Collection and Analysis Techniques

The study was conducted based on secondary data. The paper used a dataset that was assembled from annual financial reports of the sampled banks and NBE reports. When using secondary data sources the study must to lookout mainly for the quality and reliability of the data's. Therefore, the sources used in the study are audited annual financial reports of the sampled commercial banks and different reports of NBE within the time period of the study to examine the relationship between the dependent and independent variables.

As stated above, purposive sampling method is employed to select the private commercial banks from the overall banks operating in the country by taking establishment date of the bank and its data availability minimum of 10 years as selection criteria.

Data Analysis

Data analysis is a systematic process which applies statistical techniques to evaluate data through inspecting, transforming and modeling data to draw useful information or decision making. This research adopted ROA as a proxy for profitability. Different ratios are calculated for ROA and explanatory variables of eight banks using ten years period from 2008 to 2017 with the aid of Microsoft Excel. Then these data were analyzed using descriptive statistics, correlations coefficient and FE regression analysis to see the relationship of explanatory or independent variables on the dependent variable.

The descriptive statistics of both dependent and independent variables were calculated over the sampled periods. This helps to convert the raw data into a more meaning full form which enables the researcher to understand the ideas clearly. And then interpret with a statistical description including standard deviation, mean, minimum & maximum. Then, correlation analyses between dependent and independent variables were made to see the degree of linear association between them. Multiple linear regression analysis was used at the end to determine the relative importance of each independent variable in influencing the dependent variable (profitability) of Ethiopian private commercial banks. To conduct this, the researcher used statistical tools E-views 10 software. The study has also performed diagnostic tests to ensure whether the OLS assumptions are violated or not and other related tests¹. According to (Petra, 2007) OLS outperforms the other estimators when the following holds; the cross section is small and the time dimension is short. Therefore, as far as both the above facts hold true in this study it was found reasonable to use OLS in this study.

3.5.Model specification

The general model for this study, as is mostly found in the existing literature is represented by;

$$y_{i,t} = \alpha + \beta x_{i,t} + \varepsilon_{i,t}$$

The subscript i representing the cross-sectional dimension and t denote the time-series dimension. The left-hand variable represents the dependent variable in the model, which is the firm's ROA. $x_{i,t}$ Contains the set of independent variables in the estimation model, is taken to be constant over time and specific to the individual cross-sectional unit. If it is taken to be the same across units, then OLS provides a consistent and efficient estimate of α and β .

¹Housman test to identify balanced panel data and pooled data, and to know the type of balanced panel respectively

In light of the above model, the balanced panel data constructed by taking eight commercial banks was analyzed by using the following multivariate regression models.

$$ROA_{i,t} = \beta_0 + \beta_1 LA_TA_{i,t} + \beta_2 LA_TD_{i,t} + \beta_3 L_TD_{i,t} + \beta_4 L_TA_{i,t} + \varepsilon_{i,t}$$

Where:

$$ROA = \text{Return On Assets} = \left[\frac{\text{Net Income After Tax and Provisions}}{(\text{Total Assets}_t + \text{Total Assets}_{t-1})} \right] * 100\%$$

$$LA_TA = \text{Liquid Asset/Total Asset}$$

$$LA_TD = \text{Liquid Asset/Total Deposit}$$

$$L_TD = \text{Loan/Total Deposit}$$

$$L_TA = \text{Loan/Total Asset}$$

$$\text{Liquid Asset} = \text{Cash on Hand} + \text{Cash at Bank} + \text{Reserve Account with NBE} \\ + \text{Deposit with Foreign banks} + \text{Treasury Bills}$$

$$\text{Deposit} = \text{Demand Deposit} + \text{saving Deposit} + \text{Fixed Deposit}$$

ε is an error term

In this study, as it is described above, liquidity indicators are selected as the independent variables which are those variables in which the banks' management can exert control over.

These are Liquid Asset to Total Asset (LA_TA), Liquid Asset to Total Deposit Ratio (LA_TD), Loan to Total Deposit Ratio (L_TD) and Loan to Total Asset Ratio (L_TA). On the other side, bank profitability ratio is dependent variable which is measured by Return on Asset (ROA).

3.6. Research Hypotheses

As stated in the first chapter the objectives of the study are to answer the question does liquidity determine the profitability of selected private commercial banks in Ethiopia, by considering and measuring the impact of different liquidity ratios on the banks profitability.

The dependent and independent variables taken for the study based on liquidity and profitability measurements are discussed as follows:

3.6.1. Dependent Variables

Profitability of the sample banks are the dependent variable. This study uses ROA as a measurement of bank profitability. ROA reflects the ability of a bank's management to generate profits from the bank's assets. It shows the profits earned per birr of assets and indicates how effectively the bank's assets are managed to generate revenues. ROA is used to evaluate the

competence and operational performance of banks as it examines the profits generated from the assets invested by the bank (Golin, 2001) .

Basically, the higher ROA means better performance and vice-versa of the company's asset. Technically ROA can be raised by bank from either profit margin or assets turnover but not at the same time due to their trade-off.

Alternative measures of profitability are ROE and NIM. ROE is defined as the ratio between net profits and equity capital expressed as a percentage. Shareholders of bank more concern with how much bank earned for their investment to equity measured by ROE, which shows the net income after tax per Birr from equity capital. But in the literature this is not the best measure of profitability (Dietrich & Wanzenried, 2011). On the other hand, NIM variable is defined as the net interest income divided by total assets. It focused on the profit earned by on interest activities. This is because, banks with a high level of equity shows a higher ROA but a lower ROE. Therefore, in this study ROA is used as the main dependent variable.

3.6.2. Independent Variables

Liquidity of the sample banks are the independent variable and it is measured by liquidity ratios. Liquidity ratio shows the ability of a bank to match its financial obligations within period to avoid default risk or financial distress in the future (Ross, Westerfield, & Jaffe, 2005). Ratios will be applied to measure banks' ability to meet its short term obligations, keep its cash position and collect interest receivables. With general perspective, the higher the liquidity position is, the greater its ability to cover periodical obligations and guarantee safety for both its customers and depositors.

The dependent variable of the study is liquidity of private commercial banks in Ethiopia. As described in the literature part, the two most widely used approaches to measure liquidity of banks are liquidity gap approach (flow approach) and liquidity ratio approach (stock approach). Though both approaches are intuitively applying, the flow approach is more data intensive and there is no standard technique to forecast liquidity inflows and outflows. As a result, the stock approaches are more popular in practice and in the academic literature due to the availability of a more standardized method. The most popular stock ratios which are used in this study are liquid asset-to- deposits and short term borrowing ratio, liquid asset-to-total asset ratio and total loans and advances-to- deposit and short term borrowing ratio Accordingly approaches used to liquidity ratio in this study which are considered as independent variables include:

H0₁: Liquid Assets to Total Assets (LA_TA) has a significant positive effect on ROA of banks

The liquid asset to total asset ratio gives information about the general liquidity shock absorption capacity of a bank. In general when the ratio is high, it tells us that the bank has a capacity to absorb liquidity shock and that the bank is in a better position to meet its withdrawals. While, the higher this ratio may indicate inefficiency since liquid assets, most of the time non-earning assets, yield lower income. As a result maintaining optimum level of liquidity is required to optimize the trade-off between liquidity and profitability by investing excess liquid asset to generate higher return.

$$L1(LA_TA) = \frac{\text{Liquid Asset}}{\text{Total Asset}}$$

H0₂: Liquid Assets to Total Deposit (LA_TD) has a significant positive effect on ROA of banks

Liquidity ratio (LA_TD) measures the liquidity of a bank assuming that the bank cannot borrow from other banks in case of liquidity need. This is relatively strict measure of liquidity but it enables the researcher to capture at least the part of the market liquidity risk. This ascertains 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 related to 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).

It is the composition of the balance sheet relating liquid (short term) assets to volatile liabilities where the difference between the two is the net liquidity position of the bank (deficit or surplus) and is a measure of its exposure to liquidity risk. As it is stated earlier in the literature part, this measure is being used as controlling mechanism or measure of liquidity for commercial banks by the central bank (NBE) enforcing them to maintain a certain level of liquid assets. It is calculated as;

$$L2(LA_TD) = \frac{\text{Liquid Asset}}{\text{Total Deposit}}$$

HO₃: *Loan to Total Deposit (L_TD) has a significant negative effect on ROA of banks*

It is a commonly used for assessing a bank's liquidity by dividing the banks total loan to its total deposits. It indicates the percentage of bank's loans funded through deposit, in other words it relates illiquid assets with liquid liabilities. If the ratio is too high, it means that banks might not have enough liquidity to cover any unforeseen fund requirements; if the ratio is too low, banks may not be earning as much as they could be.

$$IL1(L_TD) = \frac{\text{Loan}}{\text{Total Deposit}}$$

HO₄: *Loan to Total Asset(L_TA) has a significant negative effect on ROA of banks*

It is a measure of the illiquidity of the asset portfolio that can reflect excessive illiquidity and higher exposure to default risk (Arena, 2005). This ratio measures the share of loans in total assets. It indicates what percentage of the assets of the bank is tied up in illiquid loans. Therefore the higher this ratio the less liquid the bank is.

$$IL2(L_TA) = \frac{\text{Loan}}{\text{Total Asset}}$$

Table 3.1 Description of the variables and their expected relationship

Variable	Measure	Notation	Sign
Dependent variables (Profitability)			
Return On Assets	<i>Net Income Befor Tax/Total Assets</i>	ROA	
Independent variables(Liquidity)			
Liquid Assets to Total Assets Ratio	$\frac{\text{Liquid Asset}}{\text{Total Asset}}$	LA_TA	+
Liquid Assets to Deposit Ratio	$\frac{\text{Liquid Asset}}{\text{Total Deposit}}$	LA_D	+
Loan to Deposit Ratio	$\frac{\text{Loan}}{\text{Total Deposit}}$	L_D	-
Loan to Total Asset Ratio	$\frac{\text{Loan}}{\text{Total Asset}}$	L_TA	-

CHAPTER FOUR

4. DATA ANALYSIS AND DISCUSSION

In this chapter the data collected through secondary sources were presented and important correlation and regression analysis findings were discussed. The current chapter has five sections. Under the first section 4.1 the descriptive statistics of the dependent and independent variables are presented followed by correlation analysis under section 4.2. Section 4.3 presents the test for the classical linear regression model (CLRM). Then, Choosing Fixed Versus Random Effect Model are presented under section 4.4. Finally, discussions for the results of the regression analysis are made under section 4.5.

As was stated in the first chapter, the main objective of the study was to answer the question “Does liquidity determine profitability of Ethiopian private Commercial banks”. In order to achieve this objective the model presented below was used.

$$ROA_{i,t} = \beta_0 + \beta_1 LA_TA_{i,t} + \beta_2 LA_TD_{i,t} + \beta_3 L_TD_{i,t} + \beta_4 L_TA_{i,t} + \varepsilon_{i,t}$$

Where:

ROA = Net Income / Total Asset

LA_TA = Liquid Asset / Total Asset

LA_TD = Liquid Asset / Total Deposit

L_TD = Loan / Total Deposit

L_TA = Loan / Total Asset

ε = is an error term

The dependent variable in the model is Return on Asset (ROA) while the explanatory variable is liquidity which is measured by four variables; liquid asset to total asset (LA_TA), liquid asset to total deposit (LA_TD), loan to total deposit (L_TD) and loan to total asset ratios (L_TA).

4.1.Descriptive Statistics

‘Common sample’ use only the part of the sample that is available for all the series selected, whereas ‘Individual sample’ will use all available observations for each individual series. If the number of observations is the same for all series; similar to this study, the result would be identical for both options (Brooks, 2014 PP 88).

The distribution of dataset for dependent and independent variables used in the study is explained by descriptive statistics. The central idea of descriptive statistics is for a given study is a measurement of location and variability. The central value of the variables denoted by location is measured mean whereas the spread of the data from mean denoted by variability is measured by standard deviation.

If the observations for a given set of data follow a normal distribution, then the mean and variance (standard deviation) are sufficient to entirely describe the series (Brooks, 2014 PP 66). But the researcher additionally discussed the minimum and maximum value of each variable as illustrated in table 4.1 below.

Table 4.1: Descriptive Statistics of the Variables

	Mean	Median	Maximum	Minimum	Std. Dev.
ROA_N	0.028922	0.029373	0.049412	-0.001973	0.009950
L_TA	0.469411	0.463945	0.659764	0.317816	0.064842
L_TD	0.615493	0.611876	0.891170	0.404914	0.088104
LA_TD	0.444259	0.417665	0.972020	0.149541	0.189332
LA_TA	0.336001	0.327695	0.635265	0.122237	0.135130

The mean value of ROA for the private commercial banks is 2.89% with the standard deviation of 0.99%. This shows that most of the selected commercial banks have reached a profitability rate of 2.89% in the period taken and the standard deviation shows that there is little variance on the reported profitability of selected banks. Even if there are banks that reported a high ROA 4.9%, there are also banks with low profitability (loss) that reported at -0.19%. Profitability for the sample period has ranged from -0.19 to 4.9% with a standard deviation of 0.99%. Even if the standard deviation shows the existence of low level of variation in the group profitability, the range between the maximum and minimum shows the existence of great variation in profit among the selected commercial banks.

The descriptive result for one of the most widely used measures of liquidity (liquid asset to total deposit ratio) shows that on average of private banks for the sampled period is 44.44%. According to NBE directive, “any licensed commercial bank shall maintain liquid asset of not less than 15% of its net current liabilities”. In doing so, the average performance result of the banks taken under the study is by far above the statutory requirement of the central bank which

indicates safe liquidity position of the banks to liquidity risk. The maximum value of LA_TD for the banks is found to be at 97% while the minimum is low to 14%. The result of the maximum and minimum range shows that, even if there are some banks with strict liquidity management policies, the maximum value is also an indicator that there exist banks with soft liquidity policies (surplus of liquid asset).

The other variable taken as an indicator of liquidity risk is loan to Total deposit ratio (L_TD). The mean value of this ratio shows 61% which is considerably lower than the international standard for loans to deposit ratio i.e. 75% (CBRC 2012), whereas its standard deviation of this ratio shows 8.8%. This indicates that on average a rational amount of volatile deposits were tied up with illiquid loans and there is high dispersion of L_TD towards its mean among banks respectively. The maximum and minimum values of L_TD are 89% and 40% which is far above and far below the standard respectively. This indicates that there are some private banks having surplus of liquidity (banks having < 75pc L_TD) and others facing liquidity stress (banks having > 75pc L_TD).

The third variable included in the study is Liquid Asset to Total Asset (LA_TA). On which the mean value of the variable is 33.6%. This implies that on average private banks in Ethiopia has 33.6% LA_TA ratio. The maximum and the minimum is 63% and 12%; the minimum recorded by BOA in the year 2017; while the maximum was seen in the year of 2008 by LIB. The standard deviation of the variable was 19%, which clearly demonstrate the variation between sampled banks is very small.

The last variable considered as an indicator for liquidity risk is loan to total asset ratio (L_TA). The standard deviation and mean of L_TA shows 6.48% & 4.7% respectively. The minimum value for LA_TA is low to 32% while the maximum is about 66%. This implies that there are banks which are illiquid because of the amount/level of investment of their assets.

4.2. Correlation Analysis

One of the measures used to identify the degree of linear association between variables is correlation. Values of the correlation coefficient are always ranged between +1 and -1. A correlation coefficient of +1 indicates that the existence of a perfect positive association between the two variables; while a correlation coefficient of -1 indicates perfect negative association. A correlation coefficient of zero, on the other hand, indicates the absence of relationship (association) between two variables (Brooks C. , 2008). In this study, the researcher working to

test the correlation coefficient in order to find the association of the independent variables with the profitability of selected private commercial banks.

As it can be seen from the result of the correlation matrix in Table-4.2, profitability (dependent variable) was negatively correlated with loan to total deposit ratio (L_TD) & loan to total Asset (L_TA), while positively correlated with liquid asset to total deposit (LA_TD) & liquid asset to total asset (LA_TA).

This indicates that banks profitability has a significant negative correlation with loan to total deposit ratio (L_TD) and loan to total asset ratio (L_TA). In contrast profitability has positive and significant correlation with liquid asset to total deposit (LA_TD) & liquid asset to total asset (LA_TA).

This indicates that banks profitability has a significant negative correlation with loan to total deposit ratio (L_TD) and loan to total asset ratio (L_TA). Therefore we can disclose that L_TD and L_TA are inversely correlated with the profitability of private comical banks in Ethiopia. In contrast profitability has positive correlation with LA_TD and LA_TA. This indicates that profitability has the positive association with those two liquidity variables and it is true when a bank holds high level of liquid asset; they can mobilize deposit or invest it on income generating activities to become profitable.

Table 4.2: Correlation Matrix

	ROA_N	L_TA	L_TD	LA_TD	LA_TA
ROA_N	1	-0.25905	-0.12431	0.124501	0.106369

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

In order to make the data ready for analysis and to get reliable results from the research, the model stated previously is tested for five CLRM assumptions. Among them the major ones are: test for heteroscedasticity, autocorrelation, multicollinearity and normality. Accordingly, the following sub-section presents the tests made.

▪ **Assumption one: the errors have zero mean ($E(\varepsilon) = 0$)**

The first assumption states that the average value of the errors should be zero. According to (Brooks C. , 2008) if the regression equation contains a constant term, this presumption will never be breached. Therefore, since the constant term (i.e. β_0) was included in the regression equation; this assumption holds good for the model.

- **Assumption two: homoscedasticity (variance of the errors is constant ($VAR \cup \tau = \sigma^2 < \infty$))**

Heteroscedasticity is a systematic pattern in the errors where the variances of the errors are not constant. When the variance of the residuals is constant it is referred as homoscedasticity, which is desirable. To test for the absence of heteroscedasticity White-Test was used in this study. In this test, if the p-value is very small, less than 0.05, it is an indicator for the presence of heteroscedasticity (Gujarat, 2004). Accordingly, based on the result of White-Test the P-value of both F-stat and x^2 is found to be greater than the level of significance (i.e., 0.18 and 0.17 respectively > 0.05). Hence, the variance of the residuals is constant and referred as homoscedasticity.

Table 4.3: Heteroskedasticity Test: White – Test

Heteroskedasticity Test: White			
F-statistic	1.608079	Prob. F(4,75)	0.1811
Obs*R-squared	6.319179	Prob. Chi-Square(4)	0.1765
Scaled explained SS	3.791838	Prob. Chi-Square(4)	0.4349

- **Assumption three: covariance between the error terms over time is zero ($cov u_i u_j = 0$)**

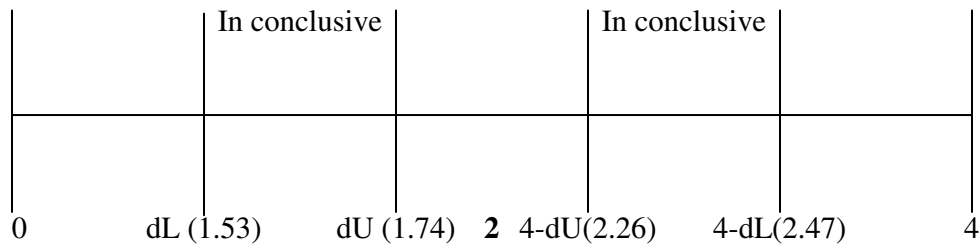
This assumption states that covariance between the error terms over time or cross-sectional, for that type of data is zero. That is, the errors should be uncorrelated with one another. If the errors are correlated with one another it is an indicator for the presence of autocorrelation or serial correlation (Brooks C. , 2008).

Accordingly, two tests were made in order to figure out the presence of autocorrelation. These are the Durbin-Watson (DW) and Breusch–Godfrey serial correlation LM test.

According to (Brooks C. , 2008), DW has two (2) critical values: an upper critical value and a lower critical value, and there is also an intermediate inconclusive region where the null hypothesis of no autocorrelation can neither be rejected nor not rejected. The rejection, non-rejection, and inconclusive regions are shown on the number line in Figure 4.1. So, the null hypothesis is rejected and the existence of positive autocorrelation presumed if DW is less than the lower critical value; the null hypothesis is rejected and an existence of negative autocorrelation is presumed if DW is greater than 4 minus the lower critical value; the null hypothesis is not rejected and no significant residual autocorrelation is presumed if DW is between the upper critical value and 4 minus the upper limits; the null hypothesis is neither

rejected nor not rejected if DW is between the lower and the upper limits, and between 4 minus the upper and 4 minus the lower limits.(1.53 - 1.74)

Figure 4.1 Rejection and Non-Rejection Regions for DW Test



Where, dU is an upper critical value and dL is a lower critical value.

Since the Durbin-Watson statistic can be difficult to interpret and it is difficult to judge the presence of autocorrelation if the value lies in the inconclusive region. Another way of showing the presence/absence of autocorrelation is by using the Breusch–Godfrey test (shown in table 4.4). The result of the statistic labeled to both F-stat and obs*R-squared (which is the LM test statistic for the null hypothesis of no serial correlation) shows a p-value of 0.17 and 0.14 respectively are greater than 0.05; which strongly indicates the absence of autocorrelation.

The result of Breusch-Godfrey LM Test after the inclusion of these lagged variables in the model is given in the Table 4.4.

Table 4.4: Autocorrelation test

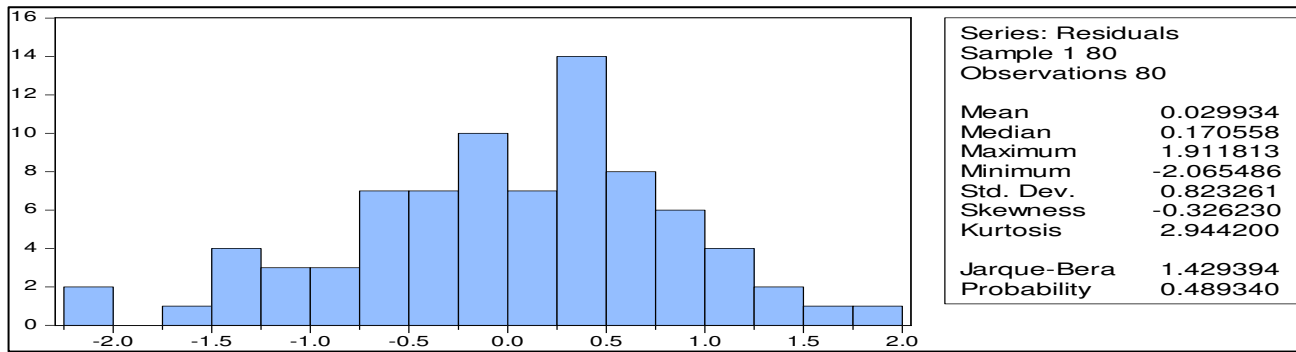
Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	1.369156	Prob. F(2,73)	0.1783
Obs *R-squared	26.59100	Prob. Chi-Square(2)	0.1472

▪ **Assumption four: Normality (errors are normally distributed)** $(u_t \sim N(0, \sigma^2))$

A normal distribution is not skewed and is defined to have a coefficient of kurtosis-3. Jarque-Bera formalizes this by testing the residuals for normality and testing whether the coefficient of both skeweness and excess kurtosis are together zero. Normality assumption of the regression model can be tested with the Jarque- Bera measure. If the Jarque-Bera value is greater than 0.05, it's an indicator for the presence of normality (Brooks C. , 2008).

The normality tests for this study as shown in Figure 4.2 the kurtosis is close to 3, and the Jarque-Bera statistic has a P-value of 0.49 which is greater 0.05 implying that the data were consistent with a normal distribution assumption.

Figure 4.2 Normality Test result



▪ **Assumption five: Multi-collinearity Test**

According to (Churchill & Lacobucci, 2005), multi-collinearity is concerned with the relationship which exists between explanatory variables. When the problem of multi-collinearity exists, the amount of information about the effect of explanatory variables on dependent variables decreases and as a result, many of the explanatory variables could be judged as not related to the dependent variables when in fact they are. How much correlation causes multi-collinearity, however, is not still clearly defined? Many authors have suggested different level of correlation to judge the presence of multi-collinearity. While (Hair, et al. 2006) argued that correlation coefficient below 0.9 may not cause serious multi-collinearity problem. (Malhotra, 2007) stated that multi-collinearity problem exists when the correlation coefficient among variables is greater than 0.75. (Kamoyo, 2006)suggests that any correlation coefficient above 0.7 could cause a serious multi-collinearity problem leading to inefficient estimation and less reliable results. This indicates that there is no consistent agreement on the level of correlation that causes multi-collinearity.

Table 4.5: Correlation matrix between explanatory variables

	ROA_N	L_TA	L_TD	LA_TD	LA_TA
ROA_N	1				
L_TA	-0.259054	1			
L_TD	-0.124313	0.690747	1		
LA_TD	0.124501	-0.51532	-0.33241	1	
LA_TA	0.106369	-0.50194	-0.38388	0.685671	1

Source: Output of E-Views

Thus from the above table we can conclude that; the maximum correlation between explanatory variables are 0.69 and 0.68, which is between L_TA and L_TD, and LA_TD and LA_TA respectively. But none of the above correlation is above the minimum cut off point i.e. 0.7 stated by (Kamoyo, 2006).

4.4.Choosing Fixed Versus Random Effect Model

The collected data were estimated based on the panel model, which included cross sectional and time series observations for ten private commercial banks that ranges over 2008 to 2017.

There are two classes of panel estimator approaches that can be employed in financial research: fixed effect and random effect models. Fixed effect model is more appropriate when the entities in the sample effectively constitute the entire population (Brooks C. , 2014). On the other hand, according to (Gujarati , 2009), the random effects model is more appropriate when the entities in the sample can be thought of as having been randomly selected from the population; while if the number of time series data is large and the number of cross-sectional units is small, there is likely to be little difference in the values of the parameters estimated by both fixed and random effect model.

In order to choose between them, a formal test so called hauseman test was often used. Hauseman test work based on the null hypothesis in favor of random effect model estimator. When the test is made it is important to see the p-value because the decision was made on the basis of this value, accordingly if p value is higher than 0.05 (i.e. it is insignificant) hence random effects is preferable, whereas if p value is lower than 0.05 (i.e. it is significant) fixed effect is preferable (Gujarat, 2004).Hence according to Housman test for this panel data model shown in table 4.1below, the model is better off if fixed effect model is used since the p-value for the model is 0.0030, which is less than 0.05(significant).

Table 4.6 Tests for choosing fixed versus random effect model

Correlated Random Effects - Hausman Test Equation: Untitled Test cross-section random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	16.028782	4	0.0030

4.5. Regression Results

This regression analysis has been done to know the impact of liquidity on the bank's profitability which is measured by the return on asset (ROA). The regression has been run using multiple linear regression models for ROA along with the explanatory variables. The E-Views 10 regression result is summarized and presented as shown in the table below.

Table 4.7: Regression Analysis Result between ROA and Explanatory Variables

Dependent Variable: ROA_N					
Method: Panel Least Squares					
Date: 10/18/18 Time: 21:55					
Sample: 2008 2017					
Periods included: 10					
Cross-sections included: 8					
Total panel (balanced) observations: 80					
Variable		Coefficient	Std. Error	t-Statistic	Prob.
LA_TD		-0.145714	0.064944	-2.243704	0.0281
LA_TA		0.190374	0.086360	2.204436	0.0309
L_TD		0.167301	0.056311	2.971004	0.0041
L_TA		-0.266976	0.079005	-3.379226	0.0012
C		0.052040	0.010288	5.058117	0.0000
Effects Specification					
Cross-section fixed (dummy variables)					
R-squared	0.351306	Mean dependent var		0.028922	
Adjusted R-squared	0.246370	S.D. dependent var		0.009950	
S.E. of regression	0.008638	Akaike info criterion		-6.527895	
Sum squared resid	0.005073	Schwarz criterion		-6.170591	
Log likelihood	273.1158	Hannan-Quinn criter.		-6.384641	
F-statistic	3.347817	Durbin-Watson stat		1.753736	
Prob(F-statistic)	0.000995				

The regression model arising from the above data is of the form;

$$ROA = 0.052 + 0.1904LA_TA - 0.1457LA_TD + 0.1673L_TD - 0.2669L_TA$$

Table 4.7: Above shows the results of the regression analysis on the determinant of the dependent variable (profitability) which was measured by the ROA and the independent variables for the sample of eight Ethiopian private commercial banks. The coefficient of determination in this model is given by R-squared of 0.35 and Adjusted R-squared of 0.24, which means 35% of the variation of Ethiopian private commercial bank's profitability can be explained by the variables included in the regression. The remaining 65% of changes were explained by other determinants which are not included in this model. Other variables not included like: asset quality, management efficiency, earning ability, capital adequacy, and other

macro variables are take the remaining part of ROA explanation excluding other variables that cannot be measured. Thus overall the explanatory power of the model is high since, 35% of ROA is explained only by those liquidity ratios included in the regression or liquidity as a whole. The value of F-statistics is 3.34 with a p-value of 0.000995 which is used to measure the overall significance of the model. Thus, the p-value of F-statistics is zero at three digits, the null hypothesis is rejected and the model is significant even at 1% significant level. The t-statistic of individual variables also indicates that two main factors, such as LA_TA and LA_TD were statistically significant at 1% confidence level. On the other hand L_TA and L_TD are significant even at 5% of significant level. Hence, in general, we can conclude that factors have a significant effect on the level of profitability of private commercial banks in Ethiopia.

Accordingly, the regression result indicates there is a negative and highly significant relationship between profitability (ROA) and loan to total asset ratio (L_TA) and liquid asset to total deposit ratio (LA_TD) having coefficient of (-0.267 and -0.1457) respectively. These implies for every increase in loan to total asset ratio and liquid asset to total deposit it decrease by 26.7% and 14.57 % on profitability.

In contrary the regression result of loan to total deposit (L_TD) and liquid asset to total asset ratio (LA_TA) indicates there is positively and highly significant relationship with profitability (ROA) by having a coefficient of 16.73 and 19.03 respectively. This indicates that for every increase in loan to total deposit and liquid asset to total asset ratio profitability increase by 16.73% and 19.03% respectively.

4.5.1. Discussion of regression results.

1. Liquid asset to total deposit ratio (LA_TD): the result of panel data regression model as presented in Table 4.7 indicates that LA_TD has negative and statistically significant on profitability of Ethiopian commercial banks by coefficient 0.1457 and p-value 0.0281.

The result is parallel with the first hypothesis i.e. negative and significant relationship with the dependent variable ROA. Based on the beta coefficient; holding other things constant; if one unit increase in LA_TD result decrease in ROA by 0.1457 units on average and the null hypothesis is rejected since the relationship is statistically significant at 5% significance level.

This finding is consistent with previous piece of literature (Kamau, 2009) and (Samuel, 2016). According to their result; when banks hold high liquid asset, the opportunity costs of the investments will increase and on which they could generate high returns. As the result, the

negative and significant relation in this study implies Ethiopian commercial banks hold high liquid assets which could have suppose to generate high returns in the cost of their profitability. One of the reasons for this could be the enforcement of NBE regarding to 40% of their disbursement on loans to be short term which is not preferable by investors because of its high interest and shorter period. The other reason is the 27% bond purchase on every loan disbursement which ties up their disbursable funds by far less interest than the cost of acquiring the funds for 5 years which discourage banks to grant loan in an investment pool where all banks chase same target group or sectors. Thus as maintaining high liquidity at the cost of profitability dissatisfy the interest of the shareholder and vice versa the depositors, optimizing the level of liquid asset is necessary for attaining both goals (liquidity and profitability) simultaneously.

2. Loan to total deposit ratio (L_TD): is the first variable in the study having positive and significant factor affecting profitability and it is consistent with the second hypothesis. Holding other things constant; a unit increase in L_TD lead to increase in ROA or profitability of private commercial banks on average by 0.1673 units and the relationship is statistically insignificant even at 1% significant level. Because of this, the null hypothesis is rejected even at 1% significant level.

The banks profit is based on the interest charged against the deposits; it means the profit is generated through the positive difference between interest of loans and interest on deposits supported a study by (Tamkin & Towpek, 2006). A high L_TD indicates two things, firstly the bank is issuing out more of its deposits in the form of interest bearing loans; secondly the bank generates more income.

Similarly (Tadesse, 2017) stated that investment in short-term, less risky securities like government treasury bills leads banks to generate more profit since insufficient liquidity is one of the major reasons of bank failures. But in case of poor asset quality and failure in repayment or collection of granted loans (increment of NPLs), as banks are liable for the mobilized funds they are expected to repay the deposit money with its interest which by default decreases banks profit. In addition, Ethiopian commercial banks currently operate beyond the NBE regulation on their loan to deposit ratio 15%. This situation may lead those private commercial banks liquidity risk. Whereas, the study made by Samuel, (2014) and Rengasamy, (2014) found negative but non-significant effect of loan to deposit ratio on return on asset.

3. Loan to total asset ratio (L_TA): the negative and significant sign of L_TA ratio on profitability of Ethiopian private commercial banks is also stick with the third hypothesis. When interpreting the result; *ceteris paribus*; when the L_TA increase by one unit then profitability of

Ethiopian private commercial banks will decrease by 0.2669 on average and their relationship is statistically insignificant even at 1% significant level. Thus; the researcher is rejected the null hypothesis with the minimum possible tolerance level. This can also be interpreted as there is a high chance that the loan to total asset affects profitability of private commercial banks negatively. This ratio indicates how much a firm is financially leveraged and the more leverage the more the risky it is.

4. Liquid asset to total asset ratio (LA_TA):It is a measure of the maturity structure of the asset portfolio that can reflect excessive maturity unbalances Cihak and Poghosyan, (2009). Furthermore, it measures the overall liquidity position of the bank. The liquid asset includes cash in hand, balance with institutions and money at call and short notice. The total assets include the revaluation of all the assets. The higher is the ratio, the more liquid an institution is considered. The test for a significant relationship of LA_TA with ROA of Ethiopian private commercial banks is in line with the fourth hypothesis. The beta coefficient indicates that holding other things constant if the LA_TA increase by one unit then ROA is on average increase by 0.1903 units and their relationship is statistically significant even at 1% significant level. The result is consistent with the previous trials such as Workineh, (2016), Lily, (2014),and Tseganesh, (2012); they all stated that the coefficient of liquid asset to total asset was positive and directly related with ROE.

CHAPTER FIVE

5. SUMMARY, CONCLUSION AND RECOMMENDATION

5.1. Summary of Findings

The study was conducted with an aim of examining “does liquidity determine on profitability of private commercial banks in Ethiopia?” As discussed in the first three chapters; the researcher used ROA to measure profitability of banks. The study used panel data during the period 2008-2017 and selected eight banks as a sample out of sixteen commercial banks that were operating on these periods. In the fourth chapter descriptive statistics, correlation analysis and balanced FE regression analysis were performed to describe the effect of liquidity on profitability of private commercial banks. The final chapter presents a conclusion of the study by summarizing the study’s findings and provides a recommendation for stakeholders as well as for further studies.

The main objective of this study was to answer the question “does liquidity determine profitability of private commercial banks in Ethiopia?” Using 10 years data (2008-2017) and 8 private commercial banks, the study carried out by constructing balanced panel regression model based on OLS and fixed effects using secondary data obtained from the annual audited financial statements of the banks under the study.

The overall result obtained from the regression model indicates that liquidity as a determinant defines profitability of private commercial banks to an important extent. This is indicated by the R-squared of the regression result implying 35.13% of variation on ROA is explained by the variation of the included explanatory variables. The percent covered by liquidity from the total ROA is not small since the banks has a number of other income generating sources like from interest, foreign exchange, and from other related activities. The remaining 65.87% retained to those other variables that are not included in the study.

The panel fixed effect estimation regression result in table 4.7 shows that; coefficient intercept (α) is 0.052040. This means, when all explanatory variables took a value of zero, the average value ROA would be take 0.052040 unit and statistically significant at 5% level of significance.

The finding of the regression result in table 4.7 shows LA_TA is positively and significantly affects ROA. The coefficient of LA_TA ratio is 0.190374 and its P- value is 0.0309 which indicate that where other explanatory variables remain constant LA_TA ratio have a positive

influence on ROA and implies that when LA_TA ratio increase by 1% then the ROA will increase by 19% and statistically significant at 5%.

LA_TD ratio has negative and significant relationship for ROA since the regression coefficient is -0.145714 and its P- value are 0.0281. This mean as the LA_TD ratio increase by 1% profitability would decrease by 14.57% and statically significant at 5%. This is due to very high initial investment as compared to the profit collected.

L_TD ratio has positive and significant relationship with ROA. According to table 4.7 the coefficient of L_TD ratio is 0.167302 and the P- value is 0.0041. Which means L_TD ratio increased by 1% commercial banks profit (ROA) increased by 16.73%?

L_TA ratio has negative and significant relationship for ROA since the regression coefficient is -0.266976 and its P- value is 0.0012. This mean as L_TA ratio increase by 1% profitability would decrease by 26.70% and statically significant at 1%.

5.2.Conclusion

To analyze the descriptive statistics, the researcher used mean, maximum, minimum and standard deviation to describe overall picture of private commercial banks in Ethiopia. After that, the study briefly discussed the correlation analysis of dependent and independent variables based on Pearson Product Moment of Correlation Coefficient. Finally fixed effect (FE) regression analysis made to identify the determinants of banking profitability. Therefore, by considering, if all private commercial banks are used ROA to measure their financial profitability and the above three analysis's the research reached on the following conclusions.

The study investigates the impact of liquidity factors on the dependent variable over the period of ten years from 2008 to 2017. Accordingly; Liquid Asset to Total Asset (LA_TA), Liquid Asset to Total Deposit (LA_TD), Loan to Total Deposit (L_TD) and Loan to Total Asset (L_TA) ratios are selected as explanatory variables while ROA is taken as dependent variable.

The co-relational analysis of the study shows that variables like Liquid Asset to Total Asset (LA_TA) and Liquid Asset to Total Deposit (LA_TD) are positively correlated to ROA; while Loan to Total Deposit (L_TD) and Loan to Total Asset (L_TA) are negatively correlated with ROA.

The results of FE regression analysis reveal that all variables found to have a significant impact on profitability of private commercial banks. From these, liquid asset to total deposit ratio and loan to total deposit appears to have a negative relation with profitability while, liquid asset to total asset and loan to total asset ratio is found to have a significant positive impact on the financial performance of private commercial banks. Generally from both descriptive as well as regression results we can conclude that liquidity has significant effect on the profitability of private commercial banks in Ethiopia.

As a result, it is found that government and central bank rules and regulations as well as enforcements on activities of private commercial banks have brought a serious pressure upon their liquidity. Hence, as the contingent characteristics of bank failure, it is very necessary and urgent to consider the liquidity condition of the private commercial banks and take the necessary early remedy action besides setting a minimum 15% cut-off rate before it is too late.

5.3.Recommendation

Finally, based on the critical evaluation of the above findings, the researcher make the following recommendations with the sincere conviction that they will help to reduce if not totally eradicate the problems associated with liquidity and profitability in private commercial banks.

- Since the success and survival of commercial banks depend on liquidity and profitability; commercial banks should not solely concentrate on the profit maximization concept but should also adopt measures that will ensure effective liquidity management by shortening asset maturities, improving the average liquidity of assets, lengthening liability maturities, issuing more equity, reducing contingent commitments and obtaining liquidity protection in order to satisfy their financial obligations to customers or depositors and maximize profits for the shareholders.
- The optimal liquidity level is reached if the commercial banks devotedly maintained the minimum liquidity requirement as stated by the NBE. This attempt helps to reduce cases of bank distress.
- For the fact that the monetary policies of NBE grossly affect liquidity management of the commercial banks, NBE should take the interest of the later into consideration while establishing and implementing these monetary policies in general and the liquidity ratio in particular. To achieve this fact, NBE is expected to create a forum whereby its policy

makers and the management of commercial banks interact and dialogue for acceptable monetary policies.

- The National Bank should be encourage maintaining a flexible Minimum Monetary Policy or discount rate so as to enable the commercial banks take advantage of the alternative measures of meeting the unexpected withdrawal demands, and reduce the tendency of maintaining excess idle cash at expense of profitability.
- It is finally recommended that interested researchers should dwell on the same area of this research extensively using a wider data and area of coverage.

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Appendix

Appendix 1. Regression Result

Dependent Variable: ROA_N				
Method: Panel Least Squares				
Date: 10/18/18 Time: 21:55				
Sample: 2008 2017				
Periods included: 10				
Cross-sections included: 8				
Total panel (balanced) observations: 80				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LA_TD	-0.145714	0.064944	-2.243704	0.0281
LA_TA	0.190374	0.086360	2.204436	0.0309
L_TD	0.167301	0.056311	2.971004	0.0041
L_TA	-0.266976	0.079005	-3.379226	0.0012
C	0.052040	0.010288	5.058117	0.0000
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.351306	Mean dependent var	0.028922	
Adjusted R-squared	0.246370	S.D. dependent var	0.009950	
S.E. of regression	0.008638	Akaike info criterion	-6.527895	
Sum squared resid	0.005073	Schwarz criterion	-6.170591	
Log likelihood	273.1158	Hannan-Quinn criter.	-6.384641	
F-statistic	3.347817	Durbin-Watson stat	1.753736	
Prob(F-statistic)	0.000995			

Appendix 2. Housman Test

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	16.028782	4	0.0030

** WARNING: estimated cross-section random effects variance is zero.

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
LA-TD	-0.145714	-0.163620	0.000333	0.3268
LA-TA	0.190374	0.210843	0.000585	0.3973
L-TD	-0.266976	-0.276870	0.001370	0.7892
L-TA	0.167301	0.174727	0.000685	0.7766

Cross-section random effects test equation:

Dependent Variable: ROA

Method: Panel Least Squares

Date: 10/05/18 Time: 14:21

Sample: 2008 2017

Periods included: 10

Cross-sections included: 8

Total panel (balanced) observations: 80

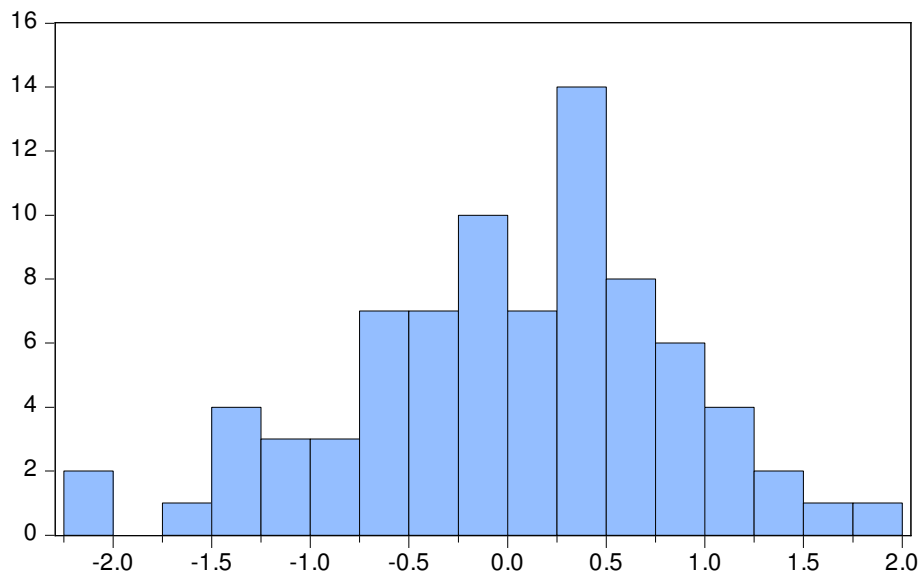
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.203991	1.028840	5.058117	0.0000
LA-TD	-0.145714	0.064944	-2.243704	0.0281
LA-TA	0.190374	0.086360	2.204436	0.0309
L-TD	-0.266976	0.079005	-3.379226	0.0012
L-TA	0.167301	0.056311	2.971004	0.0041

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.351306	Mean dependent var	2.892205
Adjusted R-squared	0.246370	S.D. dependent var	0.994983
S.E. of regression	0.863764	Akaike info criterion	2.682446
Sum squared resid	50.73395	Schwarz criterion	3.039750
Log likelihood	-95.29783	Hannan-Quinn criter.	2.825699
F-statistic	3.347817	Durbin-Watson stat	1.633736
Prob(F-statistic)	0.000995		

Appendix 3. Normality Test



Series: Residuals	
Sample 1 80	
Observations 80	
Mean	0.029934
Median	0.170558
Maximum	1.911813
Minimum	-2.065486
Std. Dev.	0.823261
Skewness	-0.326230
Kurtosis	2.944200
Jarque-Bera	1.429394
Probability	0.489340

Appendix 4. Heteroskedasticity Test: White

Heteroskedasticity Test: White

F-statistic	1.608079	Prob. F(4,75)	0.1811
Obs*R-squared	6.319179	Prob. Chi-Square(4)	0.1765
Scaled explained SS	3.791838	Prob. Chi-Square(4)	0.4349

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 10/05/18 Time: 13:26

Sample: 1 80

Included observations: 80

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.495883	0.535523	-0.925978	0.3574
LA-TA^2	0.000429	0.000321	1.335574	0.1857
LA-TA^2	-0.000579	0.000599	-0.967919	0.3362
L-TD^2	0.000754	0.000471	1.600329	0.1137
L-TA^2	-0.000199	0.000245	-0.811634	0.4196

R-squared	0.078990	Mean dependent var	0.670182
Adjusted R-squared	0.029869	S.D. dependent var	0.928809
S.E. of regression	0.914833	Akaike info criterion	2.720311
Sum squared resid	62.76892	Schwarz criterion	2.869187
Log likelihood	-103.8124	Hannan-Quinn criter.	2.779999
F-statistic	1.608079	Durbin-Watson stat	1.550860
Prob(F-statistic)	0.181069		

Appendix 5. Serial Autocorrelation Test: BG

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.369156	Prob. F(2,73)	0.1783
Obs*R-squared	26.59100	Prob. Chi-Square(2)	0.1472

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 10/26/18 Time: 15:05

Sample: 1 80

Included observations: 80

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LA_TD	0.033567	0.075169	0.446553	0.6570
LA_TA	-0.048168	0.100119	-0.481112	0.6323
L_TD	-0.042227	0.060391	-0.699231	0.4874
L_TA	0.075640	0.084422	0.895982	0.3742
C	-0.008318	0.010993	-0.756632	0.4525
RESID(-1)	0.417929	0.133224	3.137036	0.0027
RESID(-2)	-0.119877	0.143829	-0.833468	0.4082
R-squared	0.332387	Mean dependent var	2.07E-17	
Adjusted R-squared	0.041066	S.D. dependent var	0.008944	
S.E. of regression	0.008758	Akaike info criterion	-6.387395	
Sum squared resid	0.004219	Schwarz criterion	-5.643011	
Log likelihood	280.4958	Hannan-Quinn criter.	-6.088950	
F-statistic	1.140963	Durbin-Watson stat	1.866890	
Prob(F-statistic)	0.334626			

Appendix 6. Correlation Matrix

	ROA_N	L_TA	L_TD	LA_TD	LA_TA
ROA_N	1				
L_TA	-0.259054	1			
L_TD	-0.124313	0.690747	1		
LA_TD	0.124501	-0.51532	-0.33241	1	
LA_TA	0.106369	-0.50194	-0.38388	0.685671	1

Appendix 7. Descriptive Statistics

	ROA_N	L_TA	L_TD	LA_TD	LA_TA
Mean	0.028922	0.469411	0.615493	0.444259	0.336001
Median	0.029373	0.463945	0.611876	0.417665	0.327695
Maximum	0.049412	0.659764	0.89117	0.97202	0.635265
Minimum	0.001973	0.317816	0.404914	0.149541	0.122237
Std. Dev.	0.00995	0.064842	0.088104	0.189332	0.13513
Skewness	1.025933	0.127186	0.629293	0.402284	0.213994
Kurtosis	4.413816	3.233184	3.69198	2.233866	1.763188
Jarque-Bera	20.69677	0.396933	6.876249	4.114303	5.709595
Probability	0.000032	0.819987	0.032125	0.127818	0.057567
Sum	2.313764	37.55286	49.23943	35.54076	26.88005
Sum Sq. Dev.	0.007821	0.332153	0.613224	2.831879	1.442557
Observations	80	80	80	80	80

Appendix 8. Correlational ANALYSIS

	ROA_N	L_TA	L_TD	LA_TD	LA_TA
ROA_N	1	-0.25905	-0.12431	0.124501	0.106369

Appendix 9: List Of Commercial Banks In Ethiopia

No	Bank Name	Established year
1.	Abay Bank S.C.	2010
2.	Addis International Bank S.C	2011
3.	Awash International Bank	1994
4.	Bank of Abyssinia S.C	1996
5.	Berhan International Bank S.C	2010
6.	Bunna International Bank S.C	2009
7.	Commercial Bank of Ethiopia S.C	1963
8.	Cooperative Bank of Oromia S.C	2005
9.	Dashen Bank S.C	2003
10.	Debub Global Bank S.C	2012
11.	Enat Bank S.C	2013
12.	Lion International Bank S.C	2006
13.	Nib International Bank S.C	1999
14.	Oromia International Bank S.C	2008
15.	United Bank S.C	1998
16.	Wegagen Bank S.C	1997
17.	Zemen Bank S.C	2009

Source: (http://en.wikipedia.org/wiki/List_of_banks_in_Ethiopia, 2018)