The Impact of Liquidity on Profitability of Commercial Banks: *A Study conducted on selected Private Commercial Banks in Ethiopia.*

A Thesis Submitted to the School of Graduate Studies of Jimma University in Partial Fulfillment of the Requirements for the Award of the Degree of Master of Science in Banking & Finance (MSC)

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JIMMA UNIVERSITY

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DECLARATION

I hereby declare that this thesis entitled "*The Impact of Liquidity on Profitability of Commercial Banks: A Study conducted on selected Private Commercial Banks in Ethiopia",* has been carried out by me under the guidance and supervision of Mr. Ganfure Tarekegn (MSC) and Yosef Worku (MSc).

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

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CERTIFICATE

This is to certify that the thesis entitles "*The Impact of Liquidity on Profitability of Commercial Banks: A Study conducted on selected Private Commercial Banks in Ethiopia",* submitted to Jimma University for the award of the Degree of Master of *Science in Banking & Finance (MSC)* and is a record of bona fide research work carried out by Mr. *Wegenie Bekele Demissie* under our guidance and supervision.

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

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List of Acronyms

AIB= AWASH INTERNATIONAL BANK S.C

BAS=BANK SIZE

BOA= BANK OF ABSYINA S.C

CDR = CASH TO DEPOSIT RATIO

CLRM= CLASSICAL LINEAR REGRESSION MODEL

CBO= COOPERATIVE BANK OF OROMIA

DB= DASHEN BANK S.C

DTA= DEPOSIT TO ASSET RATIO

FEM =FIXED EFFECTS MODEL

LDR = LOAN TO DEPOSIT RATIO

NIB= NIB INTERNATIONAL BANK S.C

NBE = NATIONAL BANK OF ETHIOPIA

NPLS= NON-PERFORMING LOANS

OLS= ORDINARY LEAST SQUARE

OEGR= OPERATING EXPENSE TO GROSS EARNING

OIVTD= OTHER INVESTMENT TO DEPOSIT

PCBS= PRIVATE COMMERCIAL BANKS

REM= RANDOM EFFECTS MODEL

ROA = RETURN ON ASSETS

ROE = RETURN ON EQUITY

TL=TOTAL LOANS AND ADVANCES

UB= UNITED BANK S.C

VIF=VARIANCE INFLATION FACTOR

WB=WEGAGENBANKS.C

Abstract

The concept for Liquidity has been frequently used by financial institutions including the National Banks of many countries and researchers. Furthermore, as the optimum level of liquidity has a vital contribution towards development of economy, the opposite also leads to incidence of huge loss on banks in particular and country in general. Hence this study is conducted to examine the impact of liquidity on profitability of selected private commercial banks in Ethiopia. This research is explanatory research, which identifies the cause and effect relationships between the variables found in secondary data. The explanatory variables in this study are Deposit to Asset Ratio, Loan to Deposit ratio, Cash to Deposit ratio, Other Investment ratio, operational Expenses and Bank size which all measure liquidity while Return on Asset is the explained Variable. To this end, the researcher has selected seven senior private commercial banks in Ethiopia judgmentally. The study used panel data over the period 2005-2019 and secondary data was collected from National Bank of Ethiopia and selected private commercial Banks. The analysis was made using secondary panel data collected from national bank supervision department for seven banks as representatives. The study was made using STATA version 14 software. The fixed effect model was used for the analysis. The result shows that among explanatory variables included in the study Loan to Deposit ratio, Deposit to Asset ratio, Operational expense ratio and Banks size have been found significant at 5% significance level. Among the statistically significant factors affecting banks profitability, Deposit to Asset ratio and Bank size has had a positive impact on profitability of private commercial banks whereas Loan to Deposit ratio & Operational expense ratio has had negative effect on profitability of Private Commercial Banks.

The finding of this study is significant since once the impacts of Liquidity on ROA have been known; it might enable to make appropriate decisions to balance the amount of liquidity to prevent the occurrence of loss due to liquidity risk in the future. Thus; it is better for NBE and PCBs to put a clear policy framework that would addresses the issues of conflict of interest for those involved in decision making process.

Key words: *Liquidity, ROA, private commercial banks, dependent and independent variables*

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The basic principles of banking performance are principle of safety, of liquidity and of profitability. The application of these principles is obligatory for the banks in relation to their influence for stable and efficient banking performance (Slavica and Grozdana, 2001).

Liquidity is the ability of bank to fund increases in assets and meet 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 (Basel, 2008).

Bank's liquidity indicates the ability to finance its transactions efficiently. If the bank is unable to do this it is known as the liquidity risk. As this risk increases the bank is considered unable to meet its obligations such as deposits withdrawal, debt maturity and funds for loan portfolio and Investment (Ezirim F. as cited in liza,2018) which means, liquidity indicates the ability of the banks' to meet its financial obligations in a timely and effective manner.

Furthermore, according to (Peter & Eddie, 2006), liquidity is vital to the survival of a business that sufficient liquid resources should be available to meet maturing obligations (that is, debts that must be paid in the relatively near future). Some liquidity ratios examine the relationship between liquid resources held and payables (creditors) due for payment in the near future. Liquidity ratios are concerned with the ability of the business to meet its short-term financial obligations.

According to (Jan et.al, 2012) financial statements are designed primarily to meet the needs of creditors and investors. Two factors of particular concern to creditors and investors are the liquidity and profitability of a business organization. Creditors are interested in liquidity-the ability of the business to pay its debts as they come due. Liquidity is critical to the very survival of a business organization a business that is not liquid may be forced into bankruptcy by its creditors. Once bankrupt, a business may be forced by the courts to stop its operations, sell its assets (for the purpose of paying its creditors), and eventually go out of existence. Investors also are interested in the liquidity of a business organization, but often they are even more interested

in its profitability. Profitable operations increase the value of the owners' equity in the business. A company that continually operates unprofitably will eventually exhaust its resources and be forced out of existence. Therefore, most users of financial statements study these statements carefully for clues to the company's liquidity and future profitability.

Liquidity is a bank's capacity to fund increase in assets and meet both expected and unexpected cash and collateral obligations at reasonable cost and without incurring unacceptable losses (Manish Kumar, 2013). Liquidity is available cash at hand or an asset that can readily to convertible in to cash without any cost losing the value of convertible items or things or the firm's business. According to (Anyanwu, 1993) Liquidity simply means the ability to convert an asset to cash with minimum delay and minimum loss/cost. Liquidity can arise by different and complex factors, according to (Drehmann & Nikolaou, 2010 cited in Paul, 2018). First, Banks borrow large amount of short term deposits and reserves from individuals and businesses and from other lending institutions and then turn around and make long term credit available to their liabilities. Rarely would incoming cash flow from assets exactly balance the cash flowing out to cover liabilities. A problem related to the maturity mismatched situation is that banks hold an unusual high proportion of liabilities subject to immediate payment such as demand deposits now accounts and money markets borrowings. Thus, banks must always stand ready to meet immediate cash demands that can be substantial at times, especially near the end of the week, the first of each month, during certain seasons of the year.

As per NBE Directive No.SBB/44/2008 banks liquidity requirement defined "liquid assets" for the purpose of liquidity requirement, in addition to what has been provided for under 16(2) of Proclamation No. 84/1994

According to bank supervision guideline of NBE (2010), Liquidity risk is Volatility and mismatch between the current resources and current obligation of the company. Economists identify two related but distinct basic functions of banks in the economy. First, banks help direct capital to productive investments by identifying and monitoring suitable borrowers. Second, banks provide liquidity for both borrowers and depositors. Without minimizing the importance of the first function, the researcher would like to focus on banks' role in creating liquidity

1.2 Statement of the Problem

The banking sector has a pivotal role in the development of an economy, particularly in emerging economy countries like Ethiopia. It is the key driver of economic growth of the country and has a dynamic role to play in converting the idle capital resources for their optimum utilisation so as to attain maximum productivity (Sharma, 2003), which means the basic principles of banking performance are principle of safety, of liquidity and of profitability. The application of these principles is obligatory for the banks in relation to their influence for stable and efficient banking performance (Slavica and Grozdana, 2001).

However, inadequate liquidity will result to liquidity risk within which it is very detrimental to the health of any financial institution as it might lead to bankruptcy and eventually collapse of the institution (Cecchetti.et.al cited in Paul, 2018). Hence, keeping optimal level of liquidity position is a prudential way to sustain and to continue in profitable business operation.

In Ethiopia for the last two decades, the banking sector has shown an increment in growth and plays a crucial role in the economic growth of country. In this regard, for smoothing and keeping healthy of commercial banks operation has been regulated by National bank of Ethiopia. One of NBE devised directive for commercial banks that a policy that enforce banks to hold a cash reserve (liquid assets) of 15% net current liabilities (Directives No. SBB/57/2014).

Whereas, many studies conducted by different developing nation scholars the issue related to impact of liquidity and its effect on banks profitability reached different conclusion. Some studies conducted by (Adebaye.et.al, 2011) & (Dr Radhe.et al, 2008) suggested a positive relationship between liquidity and profitability. In addition, Said (2015) found a negative relation between liquidity and profitability. But, (Mohammed & Nusrat, 2014) and (Godwin, 2015) concluded as there were no relation between liquidity and profitability.

Few studies were conducted on the issue of liquidity and profitability in the case of Ethiopian commercial banks and few scholars suggested that there were both negative and positive effect of liquidity on profitability (ROA). (Tseganesh, 2012), (Birhanu, 2015), (Mekibib, 2015), (Wokneh, 2016), (Eyob, 2019), (Samuel, 2016), (Dawit, 2016) and (Tsige, 2017) were a scholars who tries to investigate the effect of liquidity on profitability of Commercial Banks in Ethiopia.

In view of previous studies, the researcher interested to examine the impact of liquidity on financial performance of private commercial banks by incorporating a new variable that is called other investment to deposit (OIVTD) which is not yet addressed by other Ethiopian scholars. Since 2011, commercial banks in Ethiopian were obligated to invest a 27% of advanced loan for NBE bill or bond. As a result, the banks' receive 3% interest return however; the banks collect the deposit from the depositors` at 5%. This may hamper liquidity and profitability of the banks.

This is, therefore the aim of this study is to fill the above gap and to find out the impacts of bank specific liquidity factors on the banks' performance and to realize which variables have impact on financial performance of ROA (dependent variables).

- Gap identified

- Inconsistence results found by previous researchers (Eyob, 2019; Samuel, 2016; Dawit, 2016; and Tsige, 2017; Mujuru, 2017).
- No or few studies conducted on the impact of OIVTD (NBE bill purchase) on ROA
- Knowledge gap among PCBs as to how the level of liquidity affects the performance of Banks.
- Area of study (Private Commercial Banks in Ethiopia)

1.3 Objective of the Study

1.3.1 General Objective

The general objective of the study is to assess the impact of liquidity on financial performance of commercial banks in Ethiopia

1.3.2 Specific Objectives

In addition to the above general objective the study would have the following specific objectives

1) To examine the impact of Loan to Deposit ratio on profitability of commercial banks
2) To investigate the impact Deposit to Asset ratio on profitability of commercial banks
3) To investigate the impact of Cash to Deposit ratio on profitability of commercial banks
4) To examine the impact of other Investment (NBE Bills purchase) on profitability of commercial banks
5) To investigate the impact of operational expense on profitability of commercial banks.
6) To check the impact of Bank size (total asset) on profitability of commercial banks.

1.4 Hypothesis of the Study

Based upon dissimilar studies that has been conducted by different scholars on the issue of related to the impact liquidity on profitability banks the following hypothesis were developed

H1: Loan deposit ratio (LDR) has significance and negative effect on banks profitability.

H2: Deposit to asset ratio (DTA) has a significance and positive effect on banks profitability.

H3: Cash to deposit ratio (CDR) has positive and significant impact on banks profitability.

H4: Other Investment (NBE bill) ratio has significant and negative influence on banks profitability.

H5: Operational expense ratio has significance negative impact on banks profitability.

H6: Bank size (BAS) has a significant positive effect on Banks profitability

1.5 Scope of the study

It is essential to describe the boundaries of the study that the readers would easily aware of the focuses area of study and the expected points to be addressed. Thus, the scope of study was limited to investigating the impact of liquidity on profitability of seven (7) privately owned commercial banks in Ethiopia operating from (2005 - 2019) period. The chosen banks are (Awash International Bank, Dashen Bank, Bank of Abyssinia, Wegagen Bank, United Bank, Nib International Bank and Cooperative Bank of Oromia) and the rational for selecting those listed banks were their operational history in banking industry for the last 15 years.

1.6 Limitation of the study

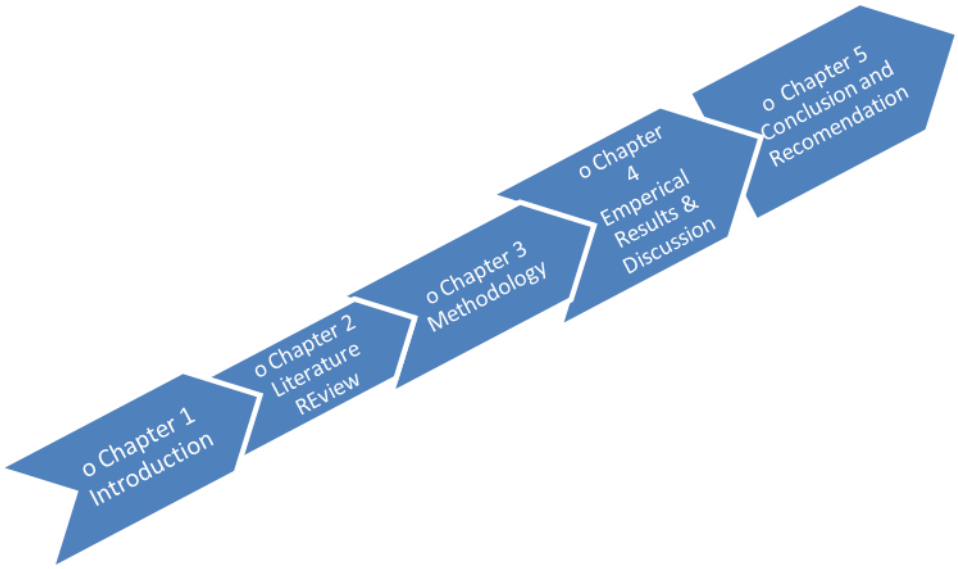
As depicts in the previous sub section the study were limited to undertake the impact of liquidity on the profitability seven (7) private commercial banks. Thus, the study has failed to consider the remaining nine (9) privately owned commercial banks which are fully engaged in banking activity. The study focused only on examining the impact of liquidity on profitability using independent variables like i.e. (LDR, DTA, CDR, OIVTD, OEGR & BAS) and dependent variable i.e. ROA. Thus, the study ignores exogenous factors like inflation or GDP & other variables.

1.7 Significance of the study

The issue of maintaining optimal liquidity is the concern of all commercial banks operating in worldwide and in our country. In this regard, this study attempts to provide potential impacts of liquidity on profitability of commercial Banks. The findings and recommendations of the study may help as a reference for top management of the banks, central banks' policy makers and for others who need to carry out further studies on the related issue. Meaning, the study will benefit parties such as banks, future researchers, and the economy of the country as a whole.

1.8 Organization of the Paper

This section gives a structure of every chapter with in this paper. The paper consists five chapters. Chapter one introduction, it presents background of the study, statement of the problem, objective of the study, significance and limitation of the study. Chapter two presents literature review. Chapter three presents the methodology employed, target population and sampling, data used in the research, and research hypothesis Chapter four discusses the result collected from the regression output. Chapter five presents conclusions of the results and the recommendations suggested by the researcher.



CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 The Concept of Liquidity

According to (Amengor, 2010 cited in Tsige, 2017) Bank liquidity is the ability to meet financial obligations as they come due. Liquidity in Commercial Bank means the bank's ability to finance all its contractual obligations when due, and these obligations can include lending, investment and withdrawal of deposits and maturity of liabilities, which happen in the normal course of the Bank actions.

Liquidity is a bank's capacity to fund increase in assets and meet both expected and unexpected cash and collateral obligations at reasonable cost and without incurring unacceptable losses (Manish Kumar, 2013). Liquidity is available cash at hand or an asset that can readily to convertible in to cash without any cost losing the value of convertible items or things or the firm's business. According to (Anyanwu, 1993) Liquidity simply means the ability to convert an asset to cash with minimum delay and minimum loss/cost. Liquidity can arise by different and complex factors, according to (Drehmann & Nikolaou, 2010 cited in Paul, 2018). First, Banks borrow large amount of short term deposits and reserves from individuals and businesses and from other lending institutions and then turn around and make long term credit available to their liabilities. Rarely would incoming cash flow from assets exactly balance the cash flowing out to cover liabilities. A problem related to the maturity mismatched situation is that banks hold an unusual high proportion of liabilities subject to immediate payment such as demand deposits now accounts and money markets borrowings. Thus, banks must always stand ready to meet immediate cash demands that can be substantial at times, especially near the end of the week, the first of each month, during certain seasons of the year.

Another source or cause of liquidity problems is the banks sensitivity to changes in an increase in interest rate in other Banks; some depositors will withdraw their funds in search of high returns elsewhere. The other sources of illiquidity arise when banks declare new interest rate (if lower) & accordingly depositors withdraw the deposits and search for other better interest rate providers. Similarly, when loan borrowers apply for new/additional loan so as to be competent

with competitors in the market and raise extra liquidity, the bank may face liquidity problem (Paul, 2018)

2.2 Concepts of profitability

Profit is one of the most important measurements in determining the health and success of a business. Profit is defined as the difference between revenue generated from the sale of output and the full opportunity cost of factor used in the production of that output (Aburime,2008) Profitability maximization is the ultimate goal for banks because of their for-profit essence, through previous definition, two aspects are concerned with profitability, the revenues generated and the cost. Thus, the ways of improving profitability includes enhancing revenues and managing cost. In general, there is several ways of improving profitability, like breakeven analysis, cost control, ratio analysis (Ibe, 2013 cited in Chembe et.al, 2018).

2.2.1 Banks Performance and Its Measurement

Banks, as the most important financial institutions, have a determinant role in circulating currency and wealth of the society and enjoy a special position in financial system. Therefore, the desired and effective performance of banks can create important effects on the development of different economic sectors and increase in the quantitative levels of the output (Naser,et al, 2013). Banks performance has many meaning its measurement technique deployed. However, most of the time banks performance is measured by returns the banks generated from its investment of an asset, the retained earnings (return on equity) and the return on assets the widely used measure of bank performance (profitability).

According to (Stephen Muthi, et.al, 2017) defined the Financial performance as measure of bank's policy and operations in monetary form. It also shows a bank's overall financial health over a period of time, and it helps to compare different banks across the banking industry at the same time

In order to assess the financial performance of commercial banks there are variety of indicators which may be used. Some of the major financial performance indicators include Return on Asset (ROA), Return on Equity (ROE) and net interest margin (NIM). In this study the researcher consider Return on Asset as a proxy for profitability measures.

2.3 Theoretical Review

2.3.1 Shift ability Theory

Shift ability is an approach to keep banks liquid by supporting the shifting of assets. When a bank is short of ready money, it is able to sell its assets to a more liquid bank. This theory posits that a bank's liquidity is maintained if it holds assets that could be shifted or sold to other lenders or investors for cash. This point of view contends that a bank's liquidity could be enhanced if it always has assets to sell and provided the Central Bank and the discount Market stands ready to purchase the asset offered for discount. Thus this theory recognizes and contends that shiftability, marketability or transferability of a bank's assets is a basis for ensuring liquidity.

2.3.2 Liability Management Theory

This theory states that there is no need to follow old liquidity norms like maintaining liquid assets, liquid investments etc., banks have focused on liabilities side of the balance sheet (**scribd.com**). According to this theory, banks can satisfy liquidity needs by borrowing in the money and capital markets. The fundamental contribution of this theory was to consider both sides of a bank's balance sheet as sources of liquidity (Emmanuel, 1997).

Today, banks use both assets and liabilities to meet liquidity needs. Available sources of liquidity are identified and compared to expected needs by a bank's Asset and liability management committee. Key considerations include maintaining high asset quality and a strong capital base that both reduces liquidity needs and improves a bank's access to funds at low cost. There is a short-run trade-off between liquidity and profitability. In the long-run, if management is successful in managing liquidity, then, long-term earnings will exceed other banks earnings, as will the capital and overall liquidity (Koch and McDonald, 2003).

2.3.3 Keynes -Liquidity preference Theory

According to (Keynes, 1936 cited in Berhanu, 2015) identified three motives on why people demand and prefer liquidity. The transaction motive, here firms hold cash in order to satisfy the cash inflow and cash outflow needs that they have. Cash is held to carry out transactions and demand for liquidity is for transactional motive. The demand for cash is affected by the size of the income, time gaps between the receipts of the income, and the spending patterns of the cash

available. The precautionary motive of holding cash serves as an emergency fund for a firm. If expected cash inflows are not received as expected cash held on a precautionary basis could be used to satisfy short-term obligations that the cash inflow may have been bench marked for. Speculative reason for holding cash is creating the ability for a firm to take advantage of special opportunities that if acted upon quickly will favor the firm.

2.3.4 Financial Intermediation Theory

The creation of liquidity is a key reason why banks exist. Banks create liquidity on the balance sheet by financing relatively illiquid assets such as business loans with relatively liquid liabilities such as transactions deposits (Allen & Christa, 2010). Current financial intermediation theory builds on the notion that intermediaries serve to reduce transaction costs and informational asymmetries (Diamond, 1984 cited in Okua, 2012)

According to the theory of financial intermediation, an important role of banks in the economy is to provide liquidity by funding long term, illiquid assets with short term, liquid liabilities (Wang, 2002 cited in Berhanu, 2015). Through this function of liquidity providers, banks create liquidity as they hold illiquid assets and provide cash and demand deposits to the rest of the economy. Intermediaries can promote growth by increasing the fraction of resources society saves and/or by improving the ways in which society allocates savings. Consider investments in firms. There are large research, legal, and organizational costs associated with such investment. These costs can include evaluating the firm, coordinating financing for the firm if more than one investor is involved, and monitoring managers (Bert &Dick, 2003).

2.4 Review of Empirical Studies

In this section we are going to present previous studies conducted by different scholars on the issue of the liquidity and profitability of commercial banks in international and local evidence

2.4.1 International Evidence

The liquidity in the commercial bank represents the ability to fund its obligations by the contractor at the time of maturity, which includes lending and investment commitments, withdrawals, deposits, and accrued liabilities (Amengor, 2010). Banks are often evaluated on their liquidity, or their ability to meet cash and collateral obligations without incurring substantial losses and with the capacity of its generating profit. Liquidity and profitability are very closely related. When one increases, the other one will decrease. Apparently liquidity and profitability goals conflict in most of decisions which the finance manager makes.

A study titled "Liquidity Management and Commercial Banks' Profitability in Nigeria" by (Adebayo et.al, 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.

According to (Naser and Mohammad, 2013) attempts to examine the effect of liquidity risk on the performance of commercial banks using of panel data related to commercial banks of Iran during the years 2003 to 2010. In the estimated research model, two groups of bank-specific variables and macroeconomic variables are used. The results of research show that the variables of bank's size, bank's asset, gross domestic product and inflation will cause to improve the performance of banks while credit risk and liquidity risk will cause to weaken the performance of bank.

According to (Mohammad & Nusrat, 2014) the study focuses on two important issues of main stakeholders of bank which are liquidity and profitability. The shareholders desire maximum profitability as a return on their investment, while the depositors opt for a maximum liquidity as a guarantee for safety and ability to pay their money on demand. Statistical significance of liquidity on profitability can be a great factor for existing and potential stakeholders. Therefore,

this study had attempted to investigate the impact of liquidity on profitability of the private commercial banks of CSE-30 in Bangladesh by focusing on certain ratios over a period of five years. Five private commercial banks have been selected to undertake the research. Profitability measures - ROA and ROE are dependent variables and liquidity measures - Loan Deposit Ratio, Deposit Asset Ratio and Cash Deposit Ratio are selected as independent variables. The research carried out simple regression analysis to test the hypotheses. However, the null hypothesis is accepted in this study indicating that there is no significant relationship between liquidity and profitability.

According to (Godwin, 2015) the study carried out to examine the liquidity-profitability trade off of deposit money banks in Nigeria on fifteen banks and covered a panel data of 2010 to 2012 using Ordinary Least Squares (OLS) technique revealed that there is a statistically significant relationship between bank liquidity measures-current ratio, liquid ratio, cash ratio, loans to deposit ratio, loans to asset ratio- and return on equity. However, when return on asset was used as proxy for profitability, the relationship became statistically insignificant.

A study of (Prof. Dr. Radhe, et.al, 2015) examines the effect of liquidity on the performance of Nepalese commercial banks. Investment ratio, liquidity ratio, capital ratio and quick ratio are the independent variables used in this study. The dependent variables are return on equity (ROE) and return on assets (ROA), while one year lagged variables for independent variables are also used to determine the more specific result of the previous year's effect on the current years ROE and ROA. The secondary sources of data have been used from annual reports of the banks and supervision report of Nepal Rastra Bank. The regression models are estimated to test the significance and effect of bank liquidity on performance of Nepalese commercial banks. Correlation between capital ratio and return on equity found to be positive indicating higher the capital ratio higher would be the return on equity. However, the correlation between return on equity and liquidity ratio is found to be negative indicating higher the liquidity in the bank lower would be the return on equity. Further, the correlation is found to be negative for quick ratio with return on equity. Beta coefficients for investment ratio and capital adequacy are positively significant with bank performance, which indicate that increase in investment ratio and capital ratio leads to increase the performance of the banks. However, beta coefficients for liquidity ratio and quick ratio are negative with return on assets and return on equity indicating increased liquidity ratio and quick ratio decreases the return on assets and return on equity of the bank.

A study on the Impact of Liquidity Risk on Banks (A Case Study of Punjab, Pakistan) was conducted by (Sadia and mohammed, 2015). The study finds negatively and significant influence of Capital Adequacy Ratio and Return on Equity to liquidity risk, while Return on Asset and Current Ratio have positively and significant effect. Return on Asset and Current Ratio influences to liquidity risk is positive and in same direction (upward) while Return on Equity and, Capital Adequacy Ratio influences to the liquidity risk is negatively and in opposite direction (downward).Return on Equity and Capital Adequacy Ratio Increases the Liquidity Risk will decreases, while Return on Asset and Current Ratio increases then Liquidity Risk will also increases.

The study of (Arnold, 2008 cited in Chembe et.al, 2018) indicates the positive impact of liquidity on profitability, it lists benefit of liquidity could bring for the companies, first of all, liquidity assets can cover the ordinary operation cost like salaries, administration expenses and so on; secondly, holding liquidity assets enables company to seize promising investment opportunities which requires rapid payments; Thirdly, liquidity helps maintenance of normal business operation in circumstances of emergency situations.

2.4.2 Related Empirical Evidence In The case of Ethiopia

There are a very limited number of studies that were specifically carried out to investigate the impact of liquidity on bank performance. Surprising studies in our countries were done focusing determinants and effect of liquidity and only counted researches were conducted on the impact of liquidity on profitability.

The research of (Tseganesh, 2012) studied the determinants of banks liquidity and their impact on financial performance on commercial banks in Ethiopia including both public and private banks. The data was analyzed by using balanced fixed effect panel regression model for eight commercial banks in the sample covered the period from 2000 to 2011 and the result of study shows that capital adequacy, bank size, share of non-performing loans in the total volume of loans, interest rate margin, inflation rate and short term interest rate had positive and statistically significant impact on banks liquidity. Whereas, Real GDP growth rate and loan growth had statistically insignificant impact on banks liquidity.

The work of (Lily, 2014) 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 (workineh, 2015) on the impact of bank liquidity on financial Performance of private commercial banks in Ethiopia results show the performance (profitability) measure, NIM, has significant relationship with liquidity measures of LDR, LAR and LADR. The other performance measure, ROE has positive and significant relationship with LADR; but ROA has positive and significant relationship with LADR.

Similarly (Berhanu, 2015) researches on the determinates of Ethiopian commercial banks liquidity and its impact on profitability using secondary data sources collected from NBEs covering a period from 2002/3-2013/14 applying panel data regression analysis. The results of regression analysis showed that Bank size and Loan growth had negative and statistically significant impact on banks liquidity measured by Liquid asset to total Asset. Real growth rate of gross domestic product on the basis price level, Interest rate on lending, Non-performing loans in the total volume of loans, Bank size, Actual reserve ratio and short term interest rate had statistically positive relationship. Among the statistically significant factors affecting banks liquidity, bank size had positive and statistically significant impact on Profitability whereas growth rate of gross domestic product on the basis price level, Actual reserve rate and Non-performing loans in the total volume of loans had negative impact on profitability. Finally he concluded that the impact of bank liquidity on commercial bank profitability was non-linear.

A study of (Dawit, 2016) study on the effect of liquidity management on profitability of commercial banks in Ethiopia using panel data of 15 commercial banks from year 2011 to 2015and the empirical results shows that the bank specific variable like **loan and advance, capital adequacy, deposit ratio, and cash &cash equivalent ratio** have weak influence on the profitability measure ROA. Finally the result indicates the impact of liquidity on profitability of commercial banks in Ethiopia is both positively & negatively related and the significant relationship varies from measure to measure.

A study was also conducted by (Sirak , 2016) on the Impact of liquidity on profitability of private commercial banks in the case of NIB International Bank Sc. 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 .Results of 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

The study of (Samuel, 2016) examine the effect of liquidity on profitability of all private commercial Banks in Ethiopia through the significant variables explaining liquidity and profitability Unbalanced panel regression model was used for data covered from 1994 -2015. The regression results showed that loan to total asset, loan to total deposit and liquid asset to total deposit had statistically significant effect on banks profitability. Among these significant variables affecting banks profitability loan to total asset had positive effect whereas, loan to total deposit and liquid asset to total deposit had negative effect on profitability. This implies that liquidity has both significant positive and negative impact on profitability and finally the researcher suggests that; the banks in order to maintain optimal level of liquidity to maximize its profit and to enhance the banks competitiveness in the industry.

The work of (Tsige, 2017) also examined the effect of liquidity on profitability of commercial banks using profitability measure of Return on Assets (ROA) and the unbalanced random effect panel regression was used for the period covering from 2005 to 2015. Five liquidity explanatory's that are affecting banks profitability were selected and analyzed. The results of panel data regression analysis showed that Cash to Deposit ratio and capital ratio had statistically significant effect on banks profitability. Liquidity ratio, deposit asset ratio and loan deposit ratio had statistically insignificant effect on banks profitability. Among the statistically significant factors affecting banks profitability cash deposit ratio had positive effect on profitability of commercial banks whereas, capital ratio had negative effect on profitability of commercial banks. Deposit asset ratio and loan deposit ratio had positive but statistically insignificant effect on financial performance but Liquidity ratio had negative but statistically insignificant effect on financial performance.

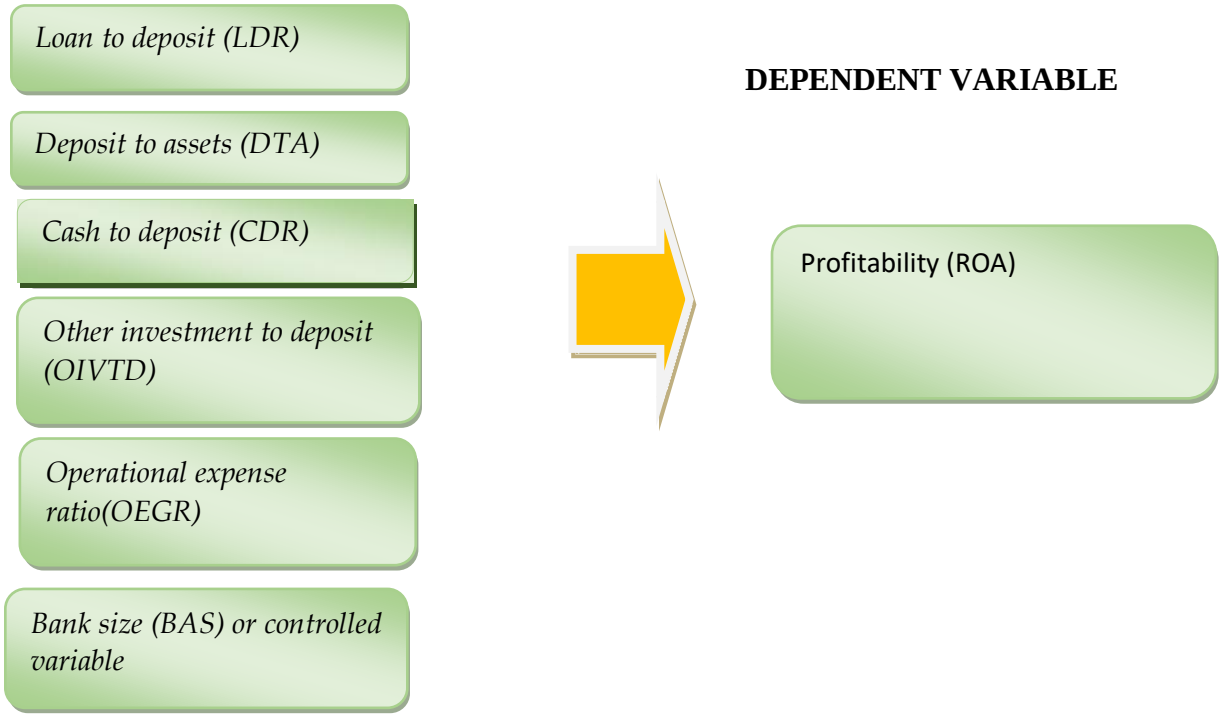
The purpose of the study of (Seblewongel, 2017) was to investigate the impact of asset liability management on profitability of banks in Ethiopia by using panel data of seven commercial banks from year 2005 to 2016. The study used quantitative research approach and analyzed by using regression models Moreover, ROA, were used to measure profitability, fixed effect regression model was applied to investigate the impact of capital adequacy, asset quality, operational efficiency, liquidity, income diversification and bank size. The finding of the study showed that income diversification, liquidity, bank size statistically significant and positive effect on banks profitability. On the other hand, variables like asset quality and operational efficiency has a negative and statistically significant effect on banks profitability. However, the relationship for capital adequacy is found to be statistically insignificant. The study revealed that asset quality ratio, operational efficiency, income diversification, liquidity, bank size is the key driver of return on asset of banks, Therefore, Bank managers are advised to give due attention to the significant variables to Improve profitability.

According to (Moges, 2017) a study conducted on the determinants of commercial banks profitability in Ethiopia using panel data of thirteen sample commercial banks out of seventeen commercial banks currently operated in Ethiopia over the period 2010-2015. Since the data is secondary in nature, the quantitative research approach was used. Besides, the fixed effect model was used. The factors used in this study include bank size, loan, expense management, revenue diversification, liquidity, capital adequacy and interest income and Return on Asset (ROA) were used to measure the bank's profitability. The findings of the study showed that bank size, loan, revenue diversification, capital adequacy and interest income have statistically significant and positive relationship with profitability. On the other hand, expense management (operating expense) has a negative and statistically significant relationship with banks' profitability. However, the relationship between liquidity management and profitability is found to be statistically insignificant. The study suggests management bodies of commercial bank should strive to strengthen the identified significant factor banks size, loan, revenue diversification, capital adequacy and interest income as this will enhance the performance of the banks. Moreover, commercial banks need to invest in recent technologies and management skills which minimize operational expense as this will affect positively on their performance.

2.5 Conceptual Framework

From the theoretical and empirical literature the following conceptual framework of the study is developed by the researcher which describes the relationship between bank liquidity with profitability (ROA)

INDEPENDENT VARIABLES



Source: Researcher own construction based on different related review literature including the work of (Tsige, 2017), (Murirury, 2017) and others

CHAPTER THREE

MATERIALS AND METHODS

3.1 Method of the study

The chapter of the research outlines the overall research methodology that is used in the study. It includes the research design, population (sample size determination), data collection; model specification, variable definition and explaining the methodology used to achieve the research objectives.

3.2 Research Design

Research design is an instrument which help researcher to draw a plan for data collection, decide the nature of data and also provide insight & information the way to analysis.

There are three basic research approaches; these are quantitative, qualitative and mixed research approaches (Creswell, 2009). In this study, the researcher used quantitative research method to examine the impact of liquidity on profitability of privately owned commercial banks in Ethiopia from a period of 2005 to 2019 via consolidated secondary data gathered from National Banks of Ethiopia (NBEs) Bank Supervision Department. Consequently, the collected panel data has been processed and filtered in excel sheet and analyzed using STATA software version 14.0.

The advantage of using panel data is to address a broader range of issues and tackle more complex problems than would be possible with pure time-series or pure cross-sectional data alone. Panel data has also the advantage of giving more informative data as it consists of both the cross sectional information, which captures individual variability, and the time series information, which captures dynamic adjustment (Brooks, 2008 cited in Tsige, 2017).

3.3 Model Specification

The study reviewed the previous findings in empirical literature and adopted the model in the context of bank specifics factors for commercial bank profitability. Thus, panel model, in a functional or econometrics form of the model, is stated as follows:

$$\mathbf{Y = \alpha + \beta 1(LDR) + \beta 2(DTA) + \beta 3(CDR) + \beta 4(OIVTD) + \beta 5(OEGR) + \beta 6(BAS) + e}$$

Where; **Y** denotes the dependent variable (profitability (**ROA**)) –

- **α** is the value of the intercept.
- **βi** is the coefficient of the explanatory x variables.
- e is the error term assumed to have zero mean & independent across time period.
- LDR- loan to deposit ratio
- DTA- deposit to asset ratio
- CDR- cash to deposit ratio
- OIVTD- other investment to total deposit
- OEGR- operational expense ratio
- BAS- natural logarithms of total asset of the bank

3.4 Sampling Size and Determination

The researcher employed purposive sampling technique to draw the sample from the population to meet the study objective. Purposive sampling techniques made in the course of the time horizon elapsed in banking industry served at least fifteen (15) years from 2005 to 2019 fiscal years. Out of the total 16 private commercial banks operating currently in Ethiopia, only seven commercial banks were selected based on seniority namely Awash Bank(AB), Dashen Bank(DB), Bank of Abyssinia, Wegagen Bank(WB), United Bank(UB), Nib International Bank(NIB) and Cooperative Bank of Oromia(CBO) and generally the study covers a period of 15 years from 2005-2019.

3.5 Data Collection Instrument

The study has used secondary data which have panel in nature from the banking supervision department of National Bank of Ethiopia. The selected period is from year 2005 to year 2019 (15 years). It was a period that the banking sector is in rapid growth and highly profitable.

3.6 Nature of data

The study used panel data. According to (Baltagi, 2005) thoughts the advantage of using panel data is that it assists to controls individual heterogeneity, reduced correlation among variables and tracks trends in the data something which simple time-series and cross-sectional data cannot provide.

3.7 Methods of Data Analysis

The collected panel data was analyzed by using STATA software version 14. Consequently, different diagnostic test were made and interpreted through descriptive statistical analysis, correlation and mean values and standard deviations were used to analyze the general trends of the data from 2005 to 2019. In addition to this, inferential statistics is applied by using a linear regression model in order to determine the relative importance of each independent variable in influencing profitability through t-statistics value. According to (Gujarati, 2004), fixed effect model is appropriate when p-value is less than 5% whereas random effect is appropriate when p-value is greater than 5%.

3.8 Operational Variables and Definition

3.8.1 Dependent variable

Return on Asset (ROA)

Return on asset is the ability of the bank management to generate income by utilizing company asset at their disposal and it also indicate the efficiency of the management of the bank net income from the resource of the banks that sourced either of the customer or the owner equity (Khrawish, 2011).

Accordingly, most scholars have tried to examine the impact of liquidity on the financial performance of banks using return on asset as a dependent variable. This ratio is defined as the

net profit after tax divided by the average total assets. It reflects the ability of any bank's management to generate profits from the value of assets. In the literature, many researchers have used ROA in their models, like (Amedemikael, 2012), (Tsige, 2017), (Berhanu, 2015), (Biruk, 2015), (Dawit, 2016) and many others.

The 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. Basically, the higher ROA means better performance and vice-versa. 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.

3.8.2 Explanatory Variables

1. **Loan to Deposit ratio (LDR)**

Loans in the numerator of the formula are investments or assets for a bank. Deposits in the denominator of the formula can be considered the same as debt as the individual depositors are essentially granting monies to the bank with a return equal to the deposit rates and that can be called upon at any time. In these respects, the loan to deposit ratio is similar to a liquidity ratio and debt ratio.

The loan-to-deposit ratio, as its name suggests, is the ratio of a bank's total outstanding loans for a period to its total deposit balance over the same period. Loan to deposit ratio is the most commonly used liquidity ratio by both banks and analysts. The loan-to-deposit ratio (LDR) is used to assess a bank's liquidity by comparing a bank's total loans to its total deposits for the same period. If the ratio is too high, it tells that the bank may not have enough liquidity to cover any unforeseen fund requirements.

Bank of Canada working paper on the title "The impact of liquidity on Bank profitability" @ 2010 described LTD ratio as ―the ratio measures the coverage of loans with stable funding, usually deposits from households and non -financial companies‖. High loans to deposits ratio means that the bank is issuing out more of its deposits in the form of interest-bearing loans, which, in turn, means it will generate more income (cited in Eyob Kindu, 2019). The problem is that the bank's loans aren't always repaid. Then the bank has to repay deposits on request, so having a ratio that's too high puts the bank at high risk which might force the bank to get

expensive deposits with higher interest rate from NBE or other Bank so as to repay for their depositors and keep the minimum NBE liquidity requirement. On the other side, a very low ratio implies that the bank is at low risk, but it isn‘t using its asset to generate more income and this end up with low profit. LTD ratio, expressed as a percentage, has varying relationship with profitability of private commercial Banks.

The impact of liquidity on profitability has been studied by different researchers in different countries and they come up with different results such as (Chember and Jing, 2018) discovered that positive correlation exists between the level of liquidity and profitability. The study of (Tsige, 2017) found that loan to deposit ratio has positive & statistically insignificant effect on profitability. Moreover, for some other studies there exists a negative relationship between liquidity and profitability (Molyneux et.al., 1992 and Guru et.al., 1999) while for some others (Adebayo et.al. 2011), there exists a positive relationship between liquidity and profitability. There are also other studies who found out a non-linear relationship between level of liquidity and banks profitability (Tseganesh, 2012 and Lily, 2014).

Though some research papers stated that loan to deposit ratio will have a positive relationship up to the optimum level 80% per (Disalvo and Johanson, 2017) & 75% per International standard for loans to deposit ratio (CBRC 2012) & negative relationship beyond the optimum level with financial performance of private commercial banks, the researcher has used LTD ratio as a variable to measure liquidity and expected that a negative effect on profitability of Commercial Banks as most LTD ratios of many Banks are more than 70%.

H1: Loan to Deposit Ratio (LDR) has significance and negative effect on banks profitability

2. Deposit to Total Asset Ratio (DTA)

Deposits to Assets are a ratio that tells to what extent bank's assets have been funded from a stable source. Deposit to asset ratio had positive but statistically insignificant effect on financial performance by many researchers. According to the empirical evidence provided by (Husni, 2011) customer deposits impact banking performance positively as long as there is a sufficient demand for loans in the market. (Okun, 2012), (Muiruri, 2017), indicated that there is a positive and significant relationship between Deposits Ratio and ROA.

H2: Deposit to asset ratio (DTA) has a significance and positive effect on banks profitability.

3. Cash to deposit ratio (CDR)

Cash to deposit ratio is defined as a percentage of the available amount of money a bank has to the total amount of money its customers have deposited into the bank. This amount is calculated so that customers can be sure that they will be able to take their money out of the bank.(Cambridge Dic, 2019)

This variable is absolute term of addition of bank cash asset (CA), bank balances and Treasury bill and certificate. Cash and cash equivalents are most liquid assets within the asset portion of company balance sheet, which are readily convertible into cash.

H3: Cash to deposit ratio (CDR) has positive and significant impact on banks profitability.

4. Other Investment (Bond /NBE Bills)

Represent the amount of bill purchased by a bank, which is measured as other investment to deposit.

The researcher used the measure of other investment(NBE-bill) adopting (Rasul's, 2013) work and expects that it may have a negative effect on profitability on selected private commercial banks because each banks is expected to buy NBE bill from 27% loan disbursement made with 3% return on investment. However, the banks pay 5% for the deposit collected from the public. Thus, it shows banks are losing 2% for every investment on NBE bill (bond). This hamper banks profitability and liquidity position.

H4: NBE-Bills have a negative and significant effect on profitability

5. Operational Expense (OEGR)

Cost to income ratio shows the overheads or costs of running the bank, including staff salaries and benefits, occupancy expenses and other expenses such as office supplies. It is used as an indicator of management's ability to control costs and is expected to have a negative relation with profits, since improved management of these expenses will increase efficiency and therefore raise profits. It is also one of the key drivers of profitability that is examined.

Operating Efficiency: measure of how the bank is managing its operating costs; it is measured as the ratio of operating expenses to total asset. This ratio qualifies management quality on

efficiency which plays a big role in determining banks sustainability in liquidity, profitability and managerial perusal. The management has an overview of bank's operations, manages the quality of loans and has to ensure that the bank is profitable.

H5: Operational expense ratio has significance negative impact on banks profitability.

6. **Banks size (BAS) controlled variable**

Banks have good reason to believe profitability and size are related. Increasing bank size can increase profitability by allowing banks to realize economies of scale. For example, increasing size allows banks to spread fixed costs over a greater asset base, thereby reducing their average cost. Bank size is also broadly defined as the bank's net total asset. It measures the general capacity to undertake intermediary function of Banks. This variable is included to capture the economies or diseconomies of scale. There are two opposing arguments both theoretically as well as empirically regarding the relationship between bank liquidity and size. The first view fail which considers negative relationship between size and liquidity while; the traditional transformation view suggests positive relationship. The proxy for bank size was the natural logarithm of total assets. (Berhanu, 2015) found that the bank size has a positive effect on profitability of a bank. This study also expected positive impact of bank size on profitability of commercial banks.

H6: Bank size (BAS) has a significant positive effect on Banks profitability

Table 1:- Summarized Description of variables and their expected relationship

	Variable Name	Measure/Description	Expected sign (+/-)	Source
Dependent	(ROA)	Interest income after/total asset		*Tseganesh(2012),Birhanu(2015),Biruk(2015),Workneh(2016),Samuel(2015),Dawit(2016),Tsige(2017) & many more*
Explanatory variables	Other investment(Bond)	Other investment /Deposit	(-)	*Yosef(2013),Mesfin(2018),*
	Loan ratio(LDR)	Net loan and advance /total Deposit	(-)	AHMED,(2009) Rahdhe et.al(2016),Samuel(2015) ,Chember and Jing (2018), Eyob(2019) Sirak(2016)
	Deposit ratio(DTA)	Deposit /Total Asset	(+)	Tsige(2017),Muiruri(2017),
	Cash to deposit	Cash / total deposit	(+)	Tsige (2017)
	Operational expense(OEGR)	operational expense /gross earning	(-)	Habtamu(2012), Birhanu Tsehay(2012), Seblewongel, Moges & Dawit Belete (all 2017)
	Bank size(BAS)	Natural Logarithm of total asset	(+)	Almost all studies

CHAPTER FOUR

RESULT AND DISCUSSION

As was stated in the first chapter, the main objective of the study was to examine the impact of liquidity on profitability of selected private commercial banks in Ethiopia. The study was conducted on sample of seven (7) Private commercial banks from 2005 to 2019. First, it gives the descriptive statistics of the Variables used in the research. Second, it presents the results of correlation analysis, tests for the classical Linear Regression Model (CLRM) Assumptions and Diagnostic Test presented along with figures and tabular forms. Furthermore, the overall findings of this study have been justified with previous various empirical studies done by different authors with help of assumptions respectively. Finally, results of the regression output have been done with justifying the formulated hypothesis.

4.1 Descriptive Statistics of the Variables

Table 2 Descriptive Statistics

Descriptive Statistics				
Variable	**Mean**	**Std. Dev.**	**Min**	**Max**
ROA	2.607714	0.8980387	-1.87	4.67
LDR	68.6961	7.78688	47.86	86.02
DTA	74.9921	11.18958	11.63	92.25
BAS	11.58857	1.83227	7.23	16.15
OEGR	24.6999	4.711166	10.55	41.97
OIVTD	3.888571	3.385501	0	10.36
CDR	26.93314	2.511492	20.24	35.29
OBS	105	105	105	105

Source: own computation through STATA 14

Profitability (ROA)

As stated in the above table all variables comprised 105 observations of panel data of seven private commercial banks for 15 years and the profitability measure(ROA) indicates that the selected banks declared , a positive mean profit after tax of 2.61% with a minimum of -1.87% and a maximum of 4.67%. Thus, most profitable banks among the sampled banks in the study

earns a maximum of 4.67 cents of profit from a single birr invested and a minimum loss of 1.87 cents from a single birr invested. On average all selected banks in the study has achieved a profit of 2.61 cents from a single birr investment and a standard deviation of (0.898%) from the mean/ average profit which implies the profitability variation between the selected banks in the study was very minimal.

Loan to Deposit ratio

The study analyzed research data for descriptive statistics for independent variable LDR was found to have (68.70%) mean with minimum of 47.86%, a maximum of 86.02% with standard deviation of 7.79% for the studied period. The mean values of 68.70% denote that on average banks financed their deposit almost 68.70% for loan during the 15-years period. In another way the result shows that banks on average have fulfilled the minimum NBE regulatory requirement of 20% of the Total Deposit including the 5% Statutory Reserve (NBE Directives No.SBB/57/2014) as a liquidity (i.e. 100%-68.7% > 20%). However, the standard deviation is very high and stood at 7.79%, it means that the variation among the selected PCBs is almost equal to half of the minimum liquidity regulatory requirement.

Deposit to Asset Ratio (DTA)

Deposit ratio is a well known indicator of liquidity and a measure of profitability of a given Bank using the customers funding sources. The mean value for deposit ratio measured by deposit to total asset was 75%, with minimum and maximum of 11.63% and 92.25% respectively. However, the standard deviation was 11.19% which indicated that there was a slightly low dispersion from the mean and the mean values denote that on average banks financed their asset almost 75% deposit during the 15-years period.

Cash to deposit ratio (CDR)

Cash ratio is a measure of cash which readily available at bank account at the time of request by the depositors and it is calculated as cash at hand to customer deposit. The mean value in table shows 26.9% and a standard deviation of 2.5% a minimum and maximum of 20.24% and 35.29% respectively which implies for a single birr deposited at banks by depositors 26.9 cents were readily available to pay out for depositors. Thus, banks are not under serious liquidity problem which in turn will positively affect the profitability and sustainability of the banks.

Furthermore, the value indicates most of operating banks are in the position of meeting a minimum liquidity requirement reserve ratio which is 15%.

Other investment to deposit ratio (NBE BILLS)

The average value of other investment measured by other investment (i.e. bond investment, equity investment and other related investment) to the total deposit shows mean value of 3.89% and a standard deviation of 3.39% from the mean with a minimum and a maximum of 0.0% and 10.36%. The mean values of 3.89% denote that on average banks financed 3.89% of their deposit to other investment for purchase of NBE bills for the past 10 years.

Bank Operational expense

The mean value of operational expense measured by operating cost to total income was found 24.70% and standard deviation of 4.71%; with minimum and maximum of 10.55% and 41.97% respectively. The mean values of 24.70% denote that on average banks expense 24.70% of their gross earning for operational expense.

Bank Size

Bank size measured by logarithm of total asset is used as a proxy of size in which the mean of the logarithm of total assets during the period was (11.59). Having the minimum and maximum values of (7.23) and (16.15) respectively and also there is relatively some variation in the size of the private commercial banks in Ethiopia as the standard deviation is (1.83).

4.2 Correlation Analysis

Correlation is one of the measures used to identify the degree of linear association between dependent and independent variables. Values of the correlation coefficient are always ranged between (+1 to-1) and 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, 2008). In this study the Pearson`s product moment of correlation coefficient were used in order to find the association or strength of linear relationship between explanatory and explained variables.

Table 3 correlation analysis

	LDR	DTA	CDR	OIVTD	OEGR	BAS
ROA	**-0.2706**	0.6238	0.3069	0.0962	**-0.2995**	0.6363
P-Value	0.000	0.000	0.228	0.418	0.000	0.000

Source: own computation through STATA 14

As can be seen from the above table, there is a negative correlation between Banks' profitability (ROA) and explanatory variables of loan to deposit(LDR) & operational expense ratio (OEGR) with a correlation coefficient of **(-0.27)** & (**-0.30)** respectively even at 1% level of significance. In contrast to this, the explanatory variables like deposit to total asset(DTA), Cash to Deposit ratio(CDR), Other Investment ratio (OIVTD) and natural logarithms of total asset(BAS) have registered positive correlation of (0.62), (0.31), (0.10) & (0.64) respectively with a profitability(ROA) though CDR & OIVTD have insignificant effect on profitability of Commercial Banks in Ethiopia.

The negative relation between LDR & ROA entails the more the loan to deposit ratio of banks, the less the ROA of private commercial banks in Ethiopia. This relationship support the statement given by (Hempel et al, 1994) a high liquidity ratio indicates a less risky and less profitable bank.

4.3 Fixed effect model and Random effects model (Model selection)

The study specifies study model through applying alternative panel regression approaches by using the two most important panel data techniques including the Fixed Effects (FEM) and Random Effects Model (REM) is used in the specification of model of the study. (Gujarati,2004 cited in Biruk, 2015) stated that the advantage of using panel data is to address a broader range of issues and tackle more complex problems than time series or using cross-sectional data alone. Similarly (Oscar, 2007) emphasis that using Panel data allows to control variables that change over time but not across entities and accounts for individual heterogeneity. With panel data one can include variables at different levels of analysis

One can use fixed effects regression model whenever the researcher wants to control omitted variables that ***differ between*** cases but are constant over time. It allows using the changes in the variables over time to estimate the effects of the independent variables on dependent variable. Otherwise random effect estimation model is used and it is the models to use when researchers

want to control for omitted variables that change over time but are ***constant between*** cases. It allows using the variation between cases to estimate the effect of the omitted independent variables on dependent variable (Gujirati, 2004). Having in mind the stated facts, in order to select appropriate model for the study a Hausman test were conducted. As a rule of thumb if the Hausman test result is less than five percent (0.05) or alpha, we will be forced to reject the null hypothesis that state random effect is not appropriate and we proceed with the alternative hypothesis which states fixed effect model is appropriate. (Please see, Appendix 8)

Table 4 Hausman test

Hausman Test				
	------Coefficients----			
	(b) Fixed	(B) Random	(b-B) Difference	Strt (diag(v_b-V_B) S.E.
LDR	-0.0324823	0.0009964	-0.0334787	0.0009337
DTA	0.041032	0.055276	-0.014244	.000
BAS	0.1236758	0.0671901	0.0564858	.000
OEGR	-0.0695344	-0.0557489	-0.0137855	.000
OIVTD	-0.0093969	0.0289	-0.0382968	.000
CDR	-0.0256315	0.1009013	-0.1265328	.000

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(6) = (b-B)'[(V_b-V_B)^(-1)](b-B)

= 48.13

Prob>chi2 = 0.0000

(V_b-V_B is not positive definite)

Source: own computation through STATA 14

Thus, based up on above facts, the researcher examined whether individual effects are fixed or random model. As shown in table, the hausman test reveals the difference between the coefficients FE and RE is systematic, providing evidence in favour of a FE model. The p-value =(0.000) means the test is less than 5%, indicating that the random effects model is not appropriate and that the fixed effects specification is preferred, thus, the analysis of this study is based on fixed effects estimations.

4.4 Classical Linear Regression Model (CLRM) Assumptions and Diagnostic Test

Before proceeding to any panel data, econometric procedures is a must to know whether the assumption of classical linear regression model (CLRM) violated or not. Thus, the following test has been done accordingly.

4.4.1 Test for Average Value of the Error Term is Zero

According to (Brooks, 2008), the first assumption in CLRM Diagnostic test is that the average value of the errors needs to be zero. In fact, if a constant term is included in the regression equation, this assumption will never be violated. Therefore, since from the regression result table the constant term (i.e. β0) was included in the regression equation; this assumption holds good for the model.

4.4.2 Test for Multicollinearity Problem

Multicollinearity is a state of very high intercorrelations or inter-associations among the independent variables. It is therefore a type of disturbance in the data, and if present in the data the statistical inferences made about the data may not be reliable.

It is phenomenon in which two or more predictor variables in a multiple regression model are highly correlated, meaning that one can be linearly predicted from the others with a substantial degree of accuracy. Multicollinearity originally meant the existence of a "perfect," or exact, linear relationship among some or all explanatory variables of a regression model (Biruk, 2015). According to (Brooks, 2008), multicollinearity will occur when some or all of the independent variables are highly correlated with one another. If the multicollinearity occurs, the regression model is not fit express the relationship betwen independent variables are influencing the dependent variable.

In this regard, many authors suggest different correlation level for deciding the presence or absence of multicollinearity. Among these, (Hair.et.al, 2006) suggest a correlation coefficient below **0.9** may not cause a series problem. Contracting to this , (Malthotra, 2007) sugessted a multicollinarity problem exist whenever a cooreleation among explanatory variables is greater than **0.75. (**Kennedy, 2008) strongly argue that a correlation coefficient above **0.7** will leads to a

seroius multicollinarity problem among the independent variables and the data will be less reliable. This implies that there is no constant agreement on the level of correlation coefficient.

If the degree of correlation between variables is high enough, it can cause **problems** to fit the model and interpret the results.

Table 5 correlation matrix between explanatory variables

	LDR	DTA	BAS	OEGR	OIVTD	CDR
LDR	1					
DTA	-0.2187	1				
BAS	-0.3893	0.4697	1			
OEGR	0.2515	0.2564	-0.4083	1		
OIVTD	-0.2124	0.0623	-0.096	0.0705	1	
CDR	0.0759	-0.2101	0.2485	-0.4873	-0.0714	1

Source: own computation through STATA 14

As shown in table above, there is no evidence for the existence of multicollinearity problem as the correlations among the independent variables is less than the correlation coefficients suggested by all scholars i.e. 0.9, 0.75 and 0.7. The maximum correlation coefficient is 0.4873. Thus, it is possible to conclude that there is no multicollinearity problem in this study. Moreover, we can also check the presence of multicollinarity problem through Variance Inflation Factor (VIF). Thus, if the mean VIF is less than 10, we can conclude that there is no evidence for the existence of multicollinarity problem (see below table).

Table 6 VIF- Multicollinearity test

Variable	VIF	1/VIF
bas	2.34	0.427
oegr	2.01	0.498
dta	1.96	0.511
cdr	1.46	0.684
ldr	1.4	0.715
oivtd	1.11	0.902
Mean VIF	**1.71**	

Source: own computation through STATA 14

4.4.3 Heteroskedasticity Test

According to (Brooks, 2008), the variance of the errors is constant this is known as the assumption of homoscedasticity. If the errors do not have a constant variance, they are said to be heteroscedastic. If heteroscedasticity occur, the estimators of the ordinary least square method are inefficient and hypothesis testing is no longer reliable or valid as it will underestimate the variances and standard errors. In this study, **Breusch-Pagan / Cook-Weisberg test for heteroskedasticity** was employed to test for the presence of heteroskedasticity. The hypothesis for the Heteroscedasticity test was formulated as follow;

H0: There is no Heteroscedasticity problem in the model.

H1: There is Heteroscedasticity problem in the model.

α = 0.05

Decision Rule: Reject H0 if p-value is less than significance level. Otherwise, do not reject H0.

Table 7- Heteroskedasity Test

Heteroscedasticity
Heteroskedasticity (Breusch-Pagan / Cook-Weisberg test for fixed Effect Regression Model)
Ho: Constant variance *Variables: fitted values of ROA*
chi2 (7) = 1.15
Prob>chi2 = 0.2845

Source: own computation through STATA 14

As it is indicated above the result of heteroscedasticity test shows that (Prob>chi2) is equal to **0.2845** (28.45%) which is greater than significance level at 5%. Therefore, we accept the null hypothesis which emphasize that there were no Heteroskedasticity problem in the model and reject the alternatives which stress there is a heteroscedasctiy problem.

4.4.4 Autocorrelation Test

This assumption stated that the covariance between the error terms over time (or cross sectionals, for that type of data) is zero. In other words, it is assumed that the errors are uncorrelated with one another. If the errors are not uncorrelated with one another, it would be stated that they are

auto correlated or that they are serially correlated (Brooks, 2008). Wooldridge test were used which was mostly used to test autocorrelation existence in panel data.

H0: There is no Autocorrelation problem in the model.

H1: There is Autocorrelation problem in the model.

Decision Rule: Reject H0 if p-value is less than (0.05) significance level. Otherwise, do not reject H0.

Table 8 Levin-Lin-Chu unit-root test

	Xtunit root test	
Variable	Statistic/Adjusted t*	P-Value
ROA	-3.4264	0.0003
LDR	-2.6114	0.0045
DTA	-3.7403	0.0001
BAS	-4.053	0
OEGR	-2.062	0.0196
OIVTD	-1.7694	0.0384
CDR	-1.9382	0.0263

Source: own computation through STATA 14

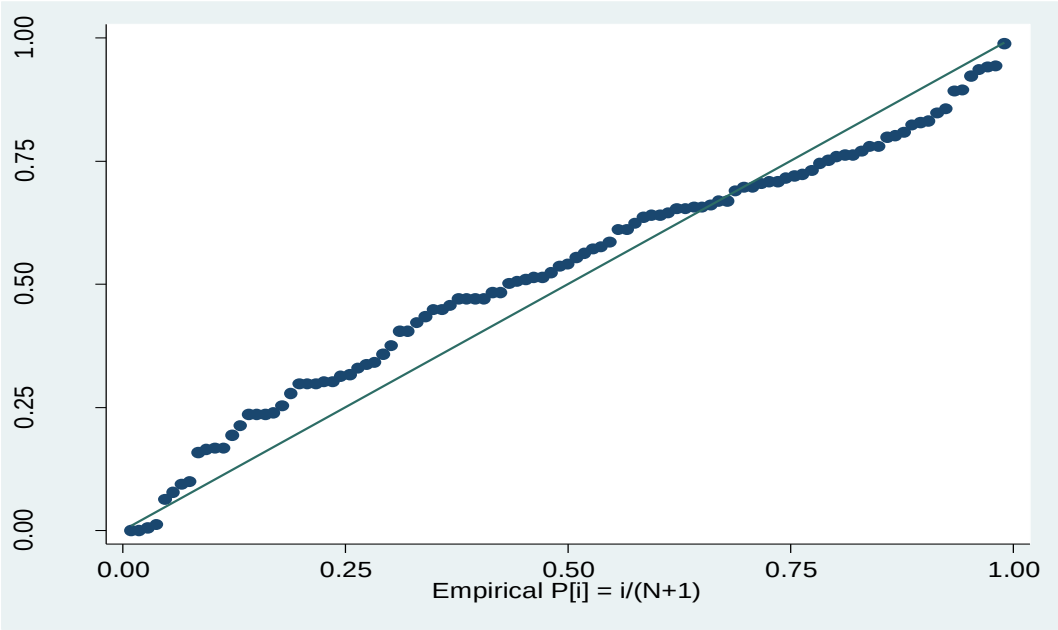
As show in the table, each **(p-values)** is less than the significance level of 5%, and failed to accept the alternative which states the there is a presence of autocorrelation. Meaning, there is no autocorrelation problem in the model.

4.4.5 Normality Test

One assumption of classical linear regression model (CLRM) is the normal distribution of the residuals part of the model. According to Guajarati (2004), before going to regression analysis, it should be noted that the normality of data should be tested.

All of the results from the examined command suggest that the residual or the error terms are normally distributed & bell-shaped. The mean and standard deviation values are near to 0 and 1 respectively. For this study, distributional graphical plot tests are used in examining the normality of distribution of the residual (ROA).

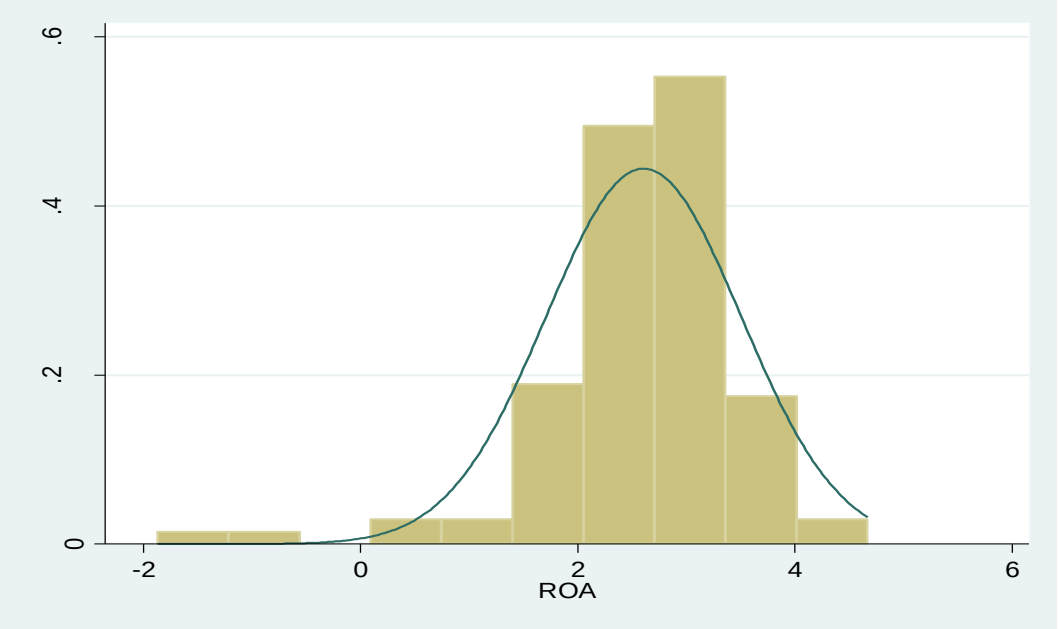
Figure 4.1 normal distribution of residual plot (ROA)



Source: NBE & financial records of selected PCBs

Generated from STATA 14.0 version

Figure 4.2: Histogram (ROA-bell shaped curve)



Source: NBE & financial records of selected PCBs

Generated from STATA 14.0 version

4.5 Results of the Fixed Effect Regression Model

Table 9 Fixed Effect Regression Model

ROA Model: Fixed Effects Regression				
ROA DETERMINANTS	**Coef.**	**Std. Err.**	**T**	**P>|t|**
LDR	-0.032482	0.007614	-4.27	0.000
DTA	0.041032	0.004862	8.44	0.000
BAS	0.123676	0.030262	4.09	0.000
OEGR	-0.069534	0.010269	-6.77	0.000
OIVTD	-0.009397	0.011545	-0.81	0.418
CDR	-0.025632	0.021132	-1.21	0.228
Cons.	2.773194	1.185991	2.34	0.022
F-statistic= 25.51	**Prob. (F-statistic) = 0.0000**			
Adjusted R2 =84.92% Notes: The P-Value=0.000 denotes significance level is even at less than 1% Source: NBE & financial statement of sample of private commercial banks & own computation through STATA 14.0 Version				

As Indicated in the table above, the loan deposit ratio (LDR) were found to be statistically significant with P-value of 0.00 at 5% level of significance. Similarly, deposit to total asset ratio (DTA), total asset of the banks (BAS), banks efficiency (OEGR) ratio also found statistically significant (all P-value=0.00) at 5% level.

On the other side, Banks profitability was statically insignificant in relation with other investment ratio (OIVTD) and cash to Deposit ratio having a probability value of 0.418 & 0.228 respectively.

Thus, the study indicates that the profitability of the banks is highly affected by the independent variables to the extent of 84.92%.

Therefore, the following formula was used for analysis purpose of the study:

$$Y = \alpha + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4X4 + \beta 5X5 + \beta 6X6 + e$$

ROA model= 2.7732-0.0325LTD+0.041DTA+0.1237BAS-0.0695OEGR-0.0094OIVTD-0.0256CDR

The constant coefficient is 2.7732, suggesting that if all explanatory variables becomes zero the return on asset would increase (declare a profit) by 2.7732 Birr.

As shown in the table, the fixed effect regression model result, R2 within, has the value of 84.92% which shows the explanatory variables power of explaining total variability of return on asset and remaining 15.08% of the variation in the profitability of private commercial banks explained by other variables which are not included in this model. The Overall significant test of (prob> F) is equal to **0.000** which implies that the selected model was statistically fitted at 1% level of significance.

4.6 Discussion of the Regression Results

Loan to Deposit Ratio (LDR)

The findings indicated that, the Loan to Deposit Ratio and the financial performance of Private Commercial Banks have a negative correlation coefficient of **0. 032482 (3.25%)** which has been found to be statistically significant ($t<0.05$, $p<0.05$), holding other variables constant. Thus, it implies a one birr increase in Loan to Deposit ratio, the profitability of private commercial banks decline approximately by 0.0325 cents or 3.25%. Besides to this, descriptive result of the study suggested that Ethiopian private commercial banks have provided an average of 68.70% of their deposit for loan which is less than the International standard for loans to deposit ratio of 75% (CBRC, 2012). Moreover, Private Banks in Ethiopia have declared a minimum and a maximum of 47.86% & 86.02% respectively which implies that there were Private Banks in Ethiopia having good liquidity position (i.e. Banks liquidity position exceeds statuary requirements of NBEs of 20%) and also there were some Banks that faced liquidity shortages from the standard (i.e. Bank with 86.02% LDR couldn't fulfilled the minimum liquidity requirement, it lefts this Bank only 100%-86.02%=13.98% which entail the Bank for unnecessary penalty & buy deposits with expensive interest rate from NBE or other Banks).

According to the result of the study, Private Commercial Banks in Ethiopia have balanced liquidity level but they might be inefficient of collecting disbursed loan in line with the repayment schedule, which increases a non performing loan rate and Banks are forced to hold high provision for doubtful debt which might lower banks' profit after tax due to high provision

and other related factors. Moreover, the result of the study suggested that Ethiopian commercial banks disburse on average 68.70% of their deposit as loan which was yet to reach the standard since (Disalvo and Johanson, 2017) infers that the standard of loan to deposit ratio was 80%. This indicates that the Ethiopian private commercial banks have not efficiently used their asset to generate income and loans that commercial banks deliver to customers are not growing at the same pace as deposits which forced them to end up with low profit. For example, Cooperative Banks of Oromia (CBO) have declared losses for three consecutive operational years.

The finding is consistent with the previous studies conducted by (Habtamu, 2012), (Dawit, 2016) & (Eyob, 2019) which stress negative correlation for Loan to Deposit Ratio against profitability of Private Commercial Banks. This result is also consistent with (Badawi, 2017) which conclude that the loan disbursed by the bank to bad debts will actually cause the bank's income decreased, it means LDR increases but the ROA decreased due to the decrease in income due to bad debts so that bank profits will drop. However this result is inconsistent with (Yunanto, 2018) and (Sirak, 2015) both cited in (Eyob, 2019) who concluded that as the value of loan to deposit ratio in the bank increases, the amount of loan disbursed to the public also increases. When the amount of loan disbursed to the community increases, the bank profit also goes up.

Therefore, the study succeed to accept the null hypothesis which stated loan to deposit ratio (LDR) has negative and significant effect on Profitability of commercial banks' in Ethiopia.

Deposit Asset Ratio (DTA)

The findings indicated that, the deposit asset ratio and the financial performance of commercial banks have a positive correlation coefficient of **0.041 (4.1%)** which has been found to be statistically significant ($t= 8.44$, $p<0.05$), holding other variables constant. It implies that the banks are more profitable and they have chances to enjoy the economies of scale due highest asset base.

Thus, the hypothesis stated that there is positive relationship between deposit to total asset ratio and profitability is accepted which is consistent with the result of (Tsige, 2017) and (Mujuru, 2017)

Cash to deposit ratio (CDR)

As stated by (Rasual, 2013) cash in a bank is the most liquid asset of a bank. A higher cash-deposit ratio indicates that a bank is relatively more liquid than a bank which has lower cash-deposit ratio. Thus, Depositors' trust to bank is enhanced when a bank maintains a higher cash-deposit ratio. It has to be noted that, the banks will face liquidity problem especially when withdrawals exceed deposit significantly over a short period of time.

The findings indicated that, the cash to deposit ratio and the financial performance of private commercial banks has a negative correlation coefficient of **0.0256(2.56%)** which has been found to be statistically insignificant ($t>0.05$, $p>0.05$), holding other variables constant. The finding implies, a unit increase in cash to deposit ratio leads to a decrease in the profitability of the private commercial banks in Ethiopia by 2.56%. However this result is inconsistent with (Tsige, 2017) who concluded that as the value of cash to deposit ratio in the bank increases, the profitability of Banks also increases.

Other Investment Ratio (NBE Bill)

According to the regression result, investing in NBE-Bills is negatively related with profitability (ROA) with a coefficient estimate of -0.009397 which implies investing one birr in other investment (bond) ratio leads a loss of 0.9397 cents or a Bank loss of 0.94% and the p value of 0.418 reveals that it is statistically insignificant at 5% level of significance. Though the result of the study revealed that the impact of purchasing NBE Bills is presently insignificance, this will have a huge impact on the performance of PCBs for the future as Banks were obligated to invest 27% on the loans they provided to their own borrowers to buy Government bonds (NBE bills) by an interest of 3% which is a very low interest amount collected from this investment, even below the interest paid for depositors. Keeping other variable being constant, other investment ratio leads to liquidity shortage for the bank and subsequently leads to a huge negative impact of customers/public trust on the banking sector.

The finding is consistent with the previous studies conducted by (Yosef , 2013) & (Mesfin, 2018) who stressed a negative correlation & statistically insignificance for Other Investment to Deposit Ratio against profitability of Private Commercial Banks. However the result is

inconsistent with (Sirak, 2016) who concluded that as the ratio of Bills purchase by the bank increases, the profitability of Banks decline.

Operational Efficiency (OEGR)

As shown in the above table, the operational efficiency ratio is negatively related with return on asset having a coefficient estimate of -0.0695 (6.95%) and a p-value of 0.000 which is statistically significant 1%. Thus**,** figure implies that a 100% increase in the operational expense leads to a decrease in bank profitability by 6.95% at 1% level of significance. Thus, the researcher concluded that as the OEGR ratio of the bank increases, the total earnings of the bank decline.

This finding is consistent with the previous studies conducted by (Seblewongel, Moges & Dawit; all 2017) & (Birhanu, 2012) who stressed a negative correlation & statistically significance for OEGR ratio against profitability of Private Commercial Banks.

Bank size (BAS)

The Bank size is computed as logarithm of total assets of banks. As the fixed effect regression estimation reveals, bank size has a positive coefficient 0.123676 and p value (0.000) related to Profitability, that means as bank size increase by one unit, profitability also increased by 0.1236766 unit considering other variables constant. Similarly, the result of the study is statistically significant at p-value of 0.000 at a 1% level of significance which implies that Banks having large amount of total asset has a significant positive impact on profitability of that Banks.

This finding is consistent with almost all previous studies conducted by different researchers including the research study of (Seblewongel, Moges & Dawit; all 2017) & (Birhanu, 2015), (Naser & Mohammed; 2013), (Gul, 2011), (Athanasoglou et al, 2006), (Sufian et al, 2009), (Weersainghe et.al, 2013), (YaC:ollahzadeh et al, 2013), (Sarita et al,2012), (Masood et al,2012), (Tigist, 2016) & (Dawit, 2016) who all found out a positive correlation & statistically significant for logarithm of BAS ratio against profitability of Private Commercial Banks in Ethiopia & concluded that large commercial banks perform better than smaller commercial banks due to economies of scale. In contrast; (Dietrich et al, 2009), (Birhanu, 2012) and (Ezra, 2013) found negative relationship between bank size and performance suggesting that the smaller the bank

the more efficient it will be. Therefore, the finding of this study & the studies of many other previous researches except few showed that the large bank size perform better than the smaller banks due to the existence of economies of scale in Ethiopian banking industry. Thus, this study accepted the hypothesis which stated there is a positive relationship between bank size and bank performance in Ethiopia.

Generally, the finding of this study under the fixed effect regression model has revealed both positive and negative relationship between liquidity and financial performance of private commercial banks.

The regression result has indicated that variables like Loan to Deposit ratio, Other investment ratio, Cash to Deposit ratio and Operating Efficiency have negative relationship with profitability of private commercial banks in Ethiopia while Bank Size & Deposit to Asset ratio have positive impact on the profitability of these Banks & four out of six variables have significant effect on Banks profitability. Thus, from the findings of the study we can conclude that liquidity has a huge impact on profitability of private commercial banks in Ethiopia.

Table 10 Comparisons of the result with pre stipulated Hypothesis

Explanatory Variables	Measurement or Description	Expected Relationship	Actual Relationship	Statistical Significance Test	Hypothesis status
LDR(Loan TO Deposit ratio)	Net loan and advance /total Deposit	-	-	Significant at 1%	Failed to reject
DTA(Deposit to Asset Ratio)	Deposit /Total Asset	+	+	Significant at 1%	Failed to reject
BAS (Bank Size)	Natural Logarithm of total asset	+	+	Significant at 1%	Failed to reject
OEGR(Bank Efficiency)	operational expense /gross earning	-	-	Significant at 1%	Failed to reject
OIVTD(Other Investment(bonds))	Other investment /Total Deposit	-	-	Insignificant	Reject
CDR (Cash to Deposit Ratio)	Cash / total deposit	+	-	Insignificant	Reject

Source: own computation through Stata 14.0

CHAPTER FIVE

SUMMARY, CONCLUSION AND POLICY IMPLICATIONS

5.1 SUMMARY

The basic intent of this chapter is to present the overall summery of the research by summing the main findings of the analysis part and finally put the overall impact of liquidity on profitability of PCBs in Ethiopia.

Accordingly, the major findings made from conducting the study are outlined below:

- The Loan to Deposit (LDR) Ratio and profitability of Private Commercial Banks in Ethiopia has significant & negative relationship, holding other variables constant.
- The Deposit to Asset (DTA) ratio and profitability of Private Commercial Banks in Ethiopia has indicated a positive & statistically significant relationship, holding other variables constant.
- Bank Size (BAS) positively and significantly affects the performance of Private Commercial Banks in Ethiopia, holding other thing being equal.
- The operational efficiency (OE-GR) ratio is negatively related with the performance of Private Commercial Banks in Ethiopia with statistically significant impact, holding other thing being equal.
- Both the findings for Cash to Deposits (CDR) & Other Investment to Deposits (OIVTD (NBE-Bills purchase)) ratios have negative & insignificant impact on profitability of Private Commercial Banks in Ethiopia, holding other variables constant.
- The liquidity-Profitability trade-off is a very challenging issue facing Private Commercial Banks in Ethiopia.

5.2 CONCLUSION

The main objective of undertaking this study was to specify the impact of liquidity on profitability with a focus on Private Commercial Banks in Ethiopia. According to the finding of the research, profitability of commercial banks was affected by Loan to Deposit, Deposit to Asset ratio, Banks operational ratio and Banks size.

The finding for the Loan to Deposit Ratio and the financial performance of Private Commercial Banks has a negative correlation coefficient of **0. 032482 (3.25%)** which has been found to be statistically significant ($t<0.05$, $p<0.05$), holding other variables constant. Thus, it implies a one birr increase in Loan to Deposit ratio, the profitability of private commercial banks decline approximately by 0.0325 cents or 3.25%. Besides to this, descriptive result of the study suggested that Ethiopian private commercial banks have provided an average of 68.70% of their deposit for loan which is less than the International standard for loans to deposit ratio of 75% (CBRC 2012). This result is also consistent with Badawi (2017) which conclude that the loan disbursed by the bank to bad debts will actually cause the bank's income to decline.

The finding of the deposit asset ratio and the financial performance of commercial banks have indicated a positive correlation coefficient of **0.041 (4.1%)** which has been found to be statistically significant ($t= 8.44$, $p<0.05$), holding other variables constant. It implies that the banks are more profitable and they have chances to enjoy the economies of scale due highest asset base.

Bank size positively and significantly affects the performance of the bank. This direct relationship between bank size and performance reveals that larger commercial banks perform better than smaller commercial banks because large banks benefited from economies of scale and also some of their costs can be reduced simply by increasing the size. Therefore, the finding of this study & the studies of many other previous researches except few showed that the large bank size perform better than the smaller banks due to the existence of economies of scale in Ethiopian banking industry.

The operational efficiency ratio is also negatively related with return on asset having a coefficient estimate of -0.0695 (6.95%) and a p-value of 0.000 which is statistically significant 1% as per the finding of the study.

The finding for cash to deposit ratio and the financial performance of private commercial banks has a negative correlation coefficient of **0.0256(2.56%)** which has been found to be statistically insignificant (t>0.05, p>0.05), holding other variables constant. However, this result is inconsistent with (Tsige, 2017) who concluded that as the value of cash to deposit ratio in the bank increases, the profitability of Banks also increases. According to the regression result, investing in NBE-Bills is also negatively related with profitability (ROA) with a coefficient estimate of -0.009397 and statistically insignificant at 5% level of significance.

To sum up, the regression result has indicated that Loan to Deposit ratio, Other investment ratio, Cash to Deposit ratio and Operating Efficiency have negative relationship with profitability of private commercial banks in Ethiopia while Bank Size & Deposit to Asset ratio have positive impact on the profitability of these Banks & four out of six variables have significant effect on Banks profitability at 5% level of significance. Thus, from the findings of the study we can conclude that the profitability of private commercial banks in Ethiopia were significantly affected by Loan to Deposit, Deposit to Asset, Banks Operational Efficiency and Bank Size Ratios. Thus, Banks have to give a serious concern for the depicted variables in this study. In other side, Other Investment to Deposit and Cash to Deposit ratios have insignificant impact on the Profitability of Private Commercial Banks in Ethiopia.

5.3 RECOMMENDATION

As discussed in the previous chapters on the basis of the research finding profitability of private commercial banks has been significantly affected by the liquidity indicators like Loan to Deposit ratio, Deposit to Asset ratio, Bank Operational Efficiency and Asset of the Banks. However, Other Investment to Deposit ratio and Cash to Deposit ratio have weak and insignificant impact on the profitability bank. Thus, on the basis of the finding the researcher recommends the following:-

- The managements of banks have to give a serious concern to reduce and control extra operating expense and increase the capacity of the employee through providing different trainings & other motivating factors that has a direct influence in generating profit of banks as the finding indicates that Operating Expense to Gross Earnings ratio has a huge negative impact on profitability of Commercial Banks.
- In terms of banks asset size, banks need to improve asset size because the study finding shows that firms with a highest share of total asset size had a better opportunity of generating a better profit. Thus, managements of Banks have to prepare plan for increasing the asset size of the bank.
- Management bodies of private commercial banks should focus on the bank specific factors like loan to deposit, operational efficiency, deposit to asset, and bank size since these variables have a huge impact on the performance of commercial Banks either positively or negatively which was also recommended by (Habtamu, 2012)

Room for further research & direction from the study

- As already discussed in previous chapters, liquidity Management is of importance in every business or corporation (Shivakumar & Thimmaiah, 2016 cited in Chembe et. al, 2018). However, this research was directed at analyzing liquidity effects on profitability in the banking sector only. Therefore, there is still a possibility to conduct further research on the subject of the impact of liquidity on profitability. It would be interesting if this study would be replicated with a focus on smaller banks as this study focused on

the banks with large asset size. It would also be interesting to extend this study to other sectors to capture more comprehensive causal effects of liquidity on profitability.

- There has to be further research apart from bank specific measures considered in this study on the impact of liquidity on performance of private commercial banks in Ethiopia by incorporating regulatory factors and other bank specific and macroeconomic factors like Money supply by NBE. Further research is recommended on how to achieve the optimal liquidity level in commercial banks. The result will help to solve the problem of excess liquidity and its effect on reducing profits, and arbitrary high profitability with its consequence to reducing liquidity position which was also recommended by (Workineh, 2015)
- Last but not least, it would be ideal to conduct a similar study but using a qualitative or mixed method approach in trying to specify the impact of liquidity on profitability of Commercial Banks so as to assure the correctness of the research findings of this study.

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Appendices:

Appendix I- Establishment Date of Private Commercial Banks in Ethiopia

No	Name of Banks	Ownership	Year of Establishment
1	Awash International Bank	Private	1994 E.C
2	Dashen Bank	Private	1995 E.C.
3	Wegagen Bank	Private	1997 E.C.
4	Bank of Abyssinia	Private	1996 E.C.
5	United Bank	Private	1998 E.C
6	Nib International bank	Private	1999 E.C.
7	Cooperative Bank of Oromia	Private	2004 G.C.
8	Lion International Bank	Private	2006 G.C.
9	Zemen Bank	Private	2008 G.C
10	Oromia International Bank	Private	2008 G.C.
11	Buna International Bank	Private	2009 G.C.
12	BerhanInternational bank	Private	2009 G.C
13	Abay Bank S.C	Private	2010 G.C
14	Addis International Bank S.C	Private	2011 G.C
15	Debub Global Bank S.C	Private	2012 G.C
16	Enat bank	Private	2012 G.c

Source: www.nbe.et

Appendix2: -Model Selection (Random Effect vs Fixed Effect Models)

. hausman fe re

---- Coefficients ----

| **(b)** | **(B)** | **(b-B)** | **sqrt(diag(V_b-V_B))**

| **fe** | **re** | **Difference** | **S.E.**

-------------+--

ldr | -.0324823 .0009964 -.0334787 .0009337

dta | .041032 .055276 -.014244 .

bas | .1236758 .0671901 .0564858 .

oegr | -.0695344 -.0557489 -.0137855 .

oivtd | -.0093969 .0289 -.0382968 .

cdr | -.0256315 .1009013 -.1265328 .

--

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(6) = (b-B)'[(V_b-V_B)^(-1)](b-B)

= 48.13

Prob>chi2 = 0.0000

(V_b-V_B is not positive definite)

Appendix3: - Fixed Effect Model

```
. xtreg roa ldr dta bas oegr oivtd cdr ,fe
Fixed-effects (within) regression               Number of obs      =       105
Group variable: bankcode                        Number of groups   =         7
R-sq:                                           Obs per group:
     within  = 0.8492                                         min =        15
     between = 0.0004                                         avg =      15.0
     overall = 0.5143                                         max =        15
                                                 F(6,92)           =     86.32
corr(u_i, Xb)  = -0.2750                         Prob > F          =     0.0000

------------------------------------------------------------------------------
         roa |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         ldr |  -.0324823   .0076136    -4.27   0.000    -.0476035   -.0173611
         dta |    .041032   .0048619     8.44   0.000     .0313757    .0506882
         bas |   .1236758   .0302618     4.09   0.000     .0635734    .1837783
        oegr |  -.0695344    .010269    -6.77   0.000    -.0899295   -.0491393
       oivtd |  -.0093969   .0115449    -0.81   0.418    -.0323259    .0135322
         cdr |  -.0256315   .0211316    -1.21   0.228    -.0676007    .0163377
       _cons |   2.773194   1.185991     2.34   0.022     .4177126    5.128675
-------------+----------------------------------------------------------------
     sigma_u |  .61301473
     sigma_e |  .32086085
         rho |  .78495226   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(6, 92) = 25.51                     Prob > F = 0.0000
```

Appendix4:- Result of Descriptive Statistics of the Variables

Summarize roa ldr dta bas oegr oivtd cdr, separator(7)

Variable	Obs	Mean	Std. Dev.	Min	Max
roa	105	2.607714	.8980387	-1.87	4.67
ldr	105	68.6961	7.78688	47.86	86.02
dta	105	74.9921	11.18958	11.63	92.25
bas	105	11.58857	1.83227	7.23	16.15
oegr	105	24.6999	4.711166	10.55	41.97
oivtd	105	3.888571	3.385501	0	10.36
cdr	105	26.93314	2.511492	20.24	35.29

Appendix 5:- Correlation between Dependent and Independent variable

. corr roa ldr dta bas oegr oivtd cdr

(obs=105)

	roa	ldr	dta	bas	oegr	oivtd	cdr
roa	1.0000						
ldr	-0.2706	1.0000					
dta	0.6238	-0.2187	1.0000				
bas	0.6363	-0.3893	0.4697	1.0000			
oegr	-0.2995	0.2515	0.2564	-0.4083	1.0000		
oivtd	0.0962	-0.2124	0.0623	-0.0960	0.0705	1.0000	
cdr	0.3069	0.0759	-0.2101	0.2485	-0.4873	-0.0714	1.0000

Appendix 6:- Correlation between Independent variables

```
. pwcorr roa ldr dta bas oegr oivtd cdr
             |      roa      ldr      dta      bas     oegr    oivtd      cdr
-------------+---------------------------------------------------------------
         roa |   1.0000
         ldr |  -0.2706   1.0000
         dta |   0.6238  -0.2187   1.0000
         bas |   0.6363  -0.3893   0.4697   1.0000
        oegr |  -0.2995   0.2515   0.2564  -0.4083   1.0000
       oivtd |   0.0962  -0.2124   0.0623  -0.0960   0.0705   1.0000
         cdr |   0.3069   0.0759  -0.2101   0.2485  -0.4873  -0.0714   1.0000
```

Appendix 7: Test for Multicollinearity

```
. estat vif
    Variable |       VIF       1/VIF
-------------+----------------------
         bas |      2.34    0.427030
        oegr |      2.01    0.498090
         dta |      1.96    0.510912
         cdr |      1.46    0.684199
         ldr |      1.40    0.715042
       oivtd |      1.11    0.902404
-------------+----------------------
    Mean VIF |      1.71
```

Appendix 8: Autocorrelation Test

	LDR	DTA	CDR	OIVTD	OEGR	BAS
ROA	**-0.2706**	0.6238	0.3069	0.0962	**-0.2995**	0.6363

Appendix:-9 Heteroskedasticity Test

. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of roa

chi2(1) = 1.15

Prob > chi2 = 0.2845

Appendix 10:- specification Test

. linktest

Source	SS	df	MS	Number of obs =	105
Model	62.2623311	2	31.1311656	Prob > F =	0.0000
Residual	21.6109212	102	.211871777	R-squared =	0.7423
Total	83.8732523	104	.80647358	Adj R-squared =	0.7373
				Root MSE =	.4603

roa	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
_hat	1.681636	.175543	9.58	0.000	1.333447	2.029824
_hatsq	-.155361	.0375919	-4.13	0.075	-.2299242	-.0807977
_cons	-.6342586	.2239163	-2.83	0.306	-1.078395	-.1901218

Appendix 11:- Financial Data

SN	BANK	YEAR	ROA	LDR	DTA	BAS	OE-GR	OIVTD	CDR
1	AIB	2005	1.71	66.49	87.15	11.52	28.86	0.15	26.65
1	AIB	2006	2.64	62.93	89.92	13.81	24.05	0.12	25.87
1	AIB	2007	3.73	58.72	92.25	15.07	20.08	0.1	26.82
1	AIB	2008	2.96	60.75	85.28	11.34	23.08	0.09	26.02
1	AIB	2009	2.23	64.67	80.27	9.58	25.22	0.08	25.64
1	AIB	2010	3.12	55.52	84.85	12.80	22.17	0.1	26.95
1	AIB	2011	3.56	51.48	86.55	13.04	21.15	5.7	30.70
1	AIB	2012	3.30	53.90	80.11	13.20	22.67	6.51	24.59
1	AIB	2013	3.16	56.46	77.19	13.42	23.12	7.18	24.82
1	AIB	2014	3.09	58.01	75.09	13.72	24.67	8.45	24.55
1	AIB	2015	2.70	60.47	77.59	11.97	27.14	9.12	24.34
1	AIB	2016	2.51	61.67	77.11	10.56	28.34	9.63	23.33
1	AIB	2017	2.39	63.80	72.88	10.46	26.79	10.04	24.01
1	AIB	2018	2.28	65.74	72.84	10.62	27.15	10.08	23.78
1	AIB	2019	2.17	67.91	71.14	10.14	28.33	10.36	23.58
2	DB	2005	2.08	78.79	82.84	11.95	27.35	0.99	23.88
2	DB	2006	2.93	75.74	86.21	12.24	23.07	0.76	24.25
2	DB	2007	3.10	72.04	87.47	12.52	21.82	0.58	24.09
2	DB	2008	3.05	71.23	78.58	12.78	22.93	0.46	24.36
2	DB	2009	2.57	76.15	81.43	10.06	24.68	0.36	23.67
2	DB	2010	2.62	73.77	82.12	11.24	24.91	4.06	29.81
2	DB	2011	3.07	62.51	84.77	13.41	21.71	4.34	24.52
2	DB	2012	3.72	57.76	88.28	14.59	24.26	3.31	25.02

2	DB	2013	3.07	59.91	80.27	10.71	27.94	3.69	24.42
2	DB	2014	3.24	56.33	80.51	12.84	26.72	3.3	25.06
2	DB	2015	2.94	58.18	80.01	10.93	27.06	4.57	28.92
2	DB	2016	2.54	60.78	79.64	10.08	28.17	5.51	24.42
2	DB	2017	2.18	62.09	80.24	10.27	30.83	6.27	24.05
2	DB	2018	2.49	60.78	79.64	12.08	28.17	5.45	26.13
2	DB	2019	2.21	62.53	80.24	12.27	29.85	5.91	26.11
3	WB	2005	2.97	77.80	79.70	11.20	27.33	0	28.07
3	WB	2006	3.14	76.98	80.71	11.54	26.09	0	28.27
3	WB	2007	3.22	75.13	78.26	11.97	25.19	0	28.13
3	WB	2008	3.37	74.11	71.91	12.14	24.04	0	28.60
3	WB	2009	3.53	71.67	72.84	12.36	23.29	0	28.54
3	WB	2010	3.89	69.06	75.32	12.47	20.91	0	28.98
3	WB	2011	4.01	68.85	77.94	12.81	18.25	5.11	29.38
3	WB	2012	4.03	67.92	78.98	12.85	17.46	6.83	34.45
3	WB	2013	3.30	70.12	72.65	10.06	21.48	6.57	28.63
3	WB	2014	2.64	74.92	70.58	8.14	22.20	7.24	27.78
3	WB	2015	2.57	76.51	71.99	8.02	24.03	7.75	26.49
3	WB	2016	2.32	77.75	68.43	8.03	25.20	7.95	26.66
3	WB	2017	2.54	74.01	66.92	10.77	23.77	7.84	26.33
3	WB	2018	2.39	76.01	65.43	10.51	25.20	8.27	29.43
3	WB	2019	2.61	72.23	66.92	11.25	23.77	7.65	25.02
4	NIB	2005	2.66	82.64	70.61	11.27	31.11	0.16	28.28
4	NIB	2006	2.86	81.58	71.63	11.43	28.06	0.14	28.64
4	NIB	2007	2.92	76.74	72.08	11.68	26.24	0.16	28.82

4	NIB	2008	3.10	75.58	67.67	12.02	25.67	0.11	30.82
4	NIB	2009	3.20	72.36	68.58	12.29	23.12	0.11	35.29
4	NIB	2010	3.36	71.69	69.13	12.51	22.09	0.09	33.08
4	NIB	2011	3.47	70.64	72.52	12.68	20.52	5.05	32.84
4	NIB	2012	3.46	71.45	70.55	12.84	20.19	6.44	30.91
4	NIB	2013	3.27	74.26	72.78	11.94	21.73	7.65	30.42
4	NIB	2014	2.77	78.15	70.72	10.31	24.74	8.73	28.77
4	NIB	2015	2.54	79.53	70.73	10.08	24.86	8.96	28.78
4	NIB	2016	2.46	79.47	68.48	10.49	25.41	9.12	27.88
4	NIB	2017	3.25	75.26	78.10	13.77	21.39	7.84	28.07
4	NIB	2018	3.44	73.47	78.48	14.49	22.41	7.57	30.09
4	NIB	2019	3.25	75.42	78.10	13.77	23.59	8.84	27.55
5	UB	2005	2.89	68.55	80.62	10.79	26.37	0	25.09
5	UB	2006	2.75	72.34	76.30	10.19	27.78	0	25.57
5	UB	2007	2.93	71.97	77.61	11.50	27.60	0	26.21
5	UB	2008	2.80	76.11	75.18	11.90	27.32	0	25.82
5	UB	2009	2.01	79.52	70.73	8.26	30.26	0.01	24.19
5	UB	2010	2.96	65.32	80.13	12.50	26.08	0.01	29.61
5	UB	2011	3.00	64.02	78.52	12.77	24.04	3.37	26.82
5	UB	2012	3.39	62.06	76.90	12.90	23.57	4.29	26.98
5	UB	2013	2.14	68.42	70.82	8.03	27.29	5.96	25.27
5	UB	2014	1.74	71.93	68.92	7.99	28.99	7.03	25.02
5	UB	2015	1.96	68.11	70.24	8.01	29.74	6.05	25.74
5	UB	2016	1.96	68.46	72.21	8.17	33.05	6.36	25.45
5	UB	2017	1.74	66.78	73.58	8.01	33.43	7.84	25.28

5	UB	2018	1.96	65.46	75.49	8.57	33.05	6.59	25.74
5	UB	2019	2.54	62.68	75.36	11.84	31.42	6.18	25.11
6	BOA	2005	2.97	75.85	79.10	11.44	21.71	0	26.76
6	BOA	2006	3.00	74.17	76.82	11.76	20.45	0	24.64
6	BOA	2007	1.97	80.71	80.12	11.95	30.07	0	24.70
6	BOA	2008	0.34	86.02	75.29	10.04	41.97	0	22.36
6	BOA	2009	1.83	80.28	82.06	12.42	33.35	0	25.62
6	BOA	2010	2.24	71.36	81.83	12.56	27.15	0	26.87
6	BOA	2011	2.49	68.58	83.47	12.71	26.56	3.45	27.05
6	BOA	2012	2.63	67.56	82.18	12.83	25.14	5.6	27.99
6	BOA	2013	2.13	70.34	83.88	10.98	22.48	6.9	26.87
6	BOA	2014	3.97	65.64	87.67	16.15	18.69	5.26	28.64
6	BOA	2015	2.13	70.26	81.35	11.34	26.72	7.24	26.24
6	BOA	2016	2.14	68.76	81.03	11.85	28.90	7.74	26.36
6	BOA	2017	2.13	67.28	81.74	11.96	25.20	7.26	26.27
6	BOA	2018	2.69	62.74	83.03	13.55	22.90	6.85	28.02
6	BOA	2019	2.86	61.28	83.74	13.96	20.22	6.42	28.75
7	CBO	2005	-0.85	60.00	11.63	8.68	12.90	0	29.50
7	CBO	2006	-1.87	79.59	23.75	7.23	26.87	0	28.37
7	CBO	2007	0.57	81.28	45.33	9.87	14.71	0	28.61
7	CBO	2008	1.73	65.79	52.24	10.33	11.39	0	29.54
7	CBO	2009	1.23	75.57	57.11	10.75	18.74	0.83	22.94
7	CBO	2010	1.42	72.61	57.58	11.29	19.21	1.71	27.79
7	CBO	2011	1.89	68.49	59.26	11.64	21.24	2.85	26.28
7	CBO	2012	2.78	60.45	66.21	13.02	20.78	4.66	28.55

7	CBO	2013	3.13	56.37	68.29	13.62	15.73	4.04	26.83
7	CBO	2014	4.67	47.86	74.14	15.74	10.55	3.68	30.76
7	CBO	2015	2.73	55.13	64.28	13.16	24.84	3.21	27.53
7	CBO	2016	1.33	64.65	79.06	10.09	32.47	3.75	20.24
7	CBO	2017	1.45	62.84	80.55	10.61	28.22	3.52	26.97
7	CBO	2018	2.43	60.67	83.06	13.26	22.47	3.12	26.80
7	CBO	2019	2.98	60.81	84.55	15.67	20.24	3.07	26.87