ST.MARY'S UNIVERSITY
SCHOOL OF GRADUATE STUDIES

FACTORS AFFECTING TIME DEPOSIT: THE CASE OF COMMERCIAL BANKS IN ETHIOPIA

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ID.NO. MBAAF/0455/2008A

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A THESIS SUBMITTED TO ST.MARY'S UNIVERSITY, SCHOOL OF GRADUATE STUDIES IN PARTIAL FULFILMENT OF THE REQUIRMENTS FOR THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION IN ACCOUNTING AND FINANCE

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DECLARATION

I, the undersigned, declare that this thesis is my original work, prepared under the guidance of Dr. Zenegnaw Abiy Hailu. All sources of materials used for the thesis have been duly acknowledged. I further confirm that the thesis has not been submitted either in part or in full to any other higher learning institution for the purpose of earning any degree.

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ENDORSMENT

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ABSTRACT

The aim of this study is to examine the factors that affect time deposit of commercial banks in Ethiopia. The study is an explanatory type of research which adopted quantitative methods of research approach using secondary panel data of six commercial banks from year 2002 to 2016. The study population is the seventeen commercial banks and one development bank that are currently operating in Ethiopia. The research adopted a non-probability sampling which is purposive sampling by considering the year of establishment and availability of data of banks to select sample from the total population. Accordingly, Commercial Bank of Ethiopia, Awash International Bank, Dashen Bank, Bank of Abyssinia, Wegagen Bank and United Bank were selected. As a main analysis technique, descriptive statistics, correlation and regression were used to come up to the research report. Hence, the dependent variable, time deposit of commercial banks and the independent variables; inflation rate, Gross Domestic Product, liquidity, profitability, lending rate, reserve requirement, and National Bank of Ethiopia Bill were regressed. The results from the regression analysis estimated by pooled panel regression model showed that liquidity and National Bank of Ethiopia bill have positive and statistically significant effect on time deposit. On the other hand, lending rate is found to have negative and statistically significant effect on time deposit of commercial banks whereas Gross Domestic Product, inflation, profitability and reserve requirement have positive but insignificant effect on time deposit of commercial banks. The study concluded that fulfilling the National Bank of Ethiopia bills requirement creates liquidity and maturity mismatch (disparity) for the banks as the National Bank of Ethiopia bill is bought for five years and there is a 40% cap for short term loans. Hence, time deposit is a good option for banks as it makes them safe from withdrawal of money by depositors for a fixed period of time and minimizes liquidity and maturity mismatch. Finally, the study recommended that the banks should study on asset-liability match and maturity match and should lend out their liquidity while mobilizing more time deposit.

Key words: Time deposit, Liquidity, National Bank of Ethiopia Bill

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LIST OF ACRONYMS

AIB Awash International Bank

ALR Average Lending Rate

BOA Bank of Abyssinia

DB Dashen Bank

CBE Commercial Bank of Ethiopia

GDP Gross Domestic Product

IMF International Monetary Fund

INF Inflation

LRR Legal Reserve Requirement

LIQ Liquidity

NBE National Bank of Ethiopia

NBEB National Bank of Ethiopia Bill

NIB Nib International Bank

ROE Return on Equity

UB United Bank

WB Wegagen Bank

CHAPTER ONE

INTRODUCTION

1.1. Background of the Study

A commercial bank is a financial institution that is authorized by law to receive money from surplus units and channel to deficit unit. Banks raise funds by collecting deposits from businesses and consumers via checkable deposits, savings deposits, and time or term deposits and make loans to businesses and consumers. They also buy corporate bonds and government bonds. Banks primary liabilities are deposits and primary assets are loans and advances (Dodoo, 2007).

As to Hana and Petr (2016), banks are financial intermediaries that are engaged in a financial process focused on a maturity transformation from short-term funding to long-term financing. Banks usually collect money from retail customers through standard channels: sight deposits (current accounts), time deposits, and a new channel: savings accounts.

One of the types of accounts of commercial banks is time deposit which is an investment account and a type of savings account in which money is deposited for a stated period of time and a fixed interest rate usually higher than the going rates is paid at the end of that period. Time deposit account offers the customers the opportunity to invest a fixed amount for a fixed period at a fixed rate of interest. Hence, the funds placed in a time deposit cannot be withdrawn during the term before maturity but can be pre-terminated subject to penalty fees (Jakia, 2015). Moreover, the author stated that time deposit accounts are best suited for individuals and business entities, particularly those with risk-averse profile who are looking for investments that are customized according to their financial and liquidity needs. These are depositors who want to enjoy high returns but would also want to have some flexibility in terms of withdrawing the funds.

Jakia (2015) pointed out the importance of time deposit from customer and bankers perspective. From customers' perspective, he stated that time deposit encourages savings habit for a longer period of time and enables the depositors to earn a high interest rate which can be used for the purchases of assets at the time of maturity. Moreover, time deposit will help the depositors to get loan facility from the banks. The author also tried to see the importance of time deposit from the banks' perspective and indicated that banks can get the funds for a longer period of time and they can lend such funds for short term loans to businessmen. Moreover he stated that time deposit is important for banks as they invest such funds in profitable areas. Time deposits indirectly boost economic development of the country.

Banson et al (2012) defined deposit mobilization as the collection of cash or funds by a financial institution from the public through its current, savings, time, recurring accounts and other banks' specialized schemes. It is a very difficult task and depends up on various exogenous as well as endogenous factors that affect it directly. The exogenous factors are factors that cannot be controlled by the banking system and are further divided into country specific factors and bank specific factors for clarification purpose. The endogenous factors are factors that can be controlled by the banking system (Dasigna, 1975).

In Ethiopia, the manner in which deposit works is guided by the NBE bill purchase regulation of 2011, which was later amended in 2013 (NBE, 2013). The regulation requires all commercial banks owned by private investors to purchase government treasury bonds amounting to 27% of their loan disbursement each time at a maturity period of 5 years. As per the NBEs' directive number NBE/INT/11/2010, these bonds pay 3% annual rate while the banks pay 5% on saving deposit. Thus, owing to this NBE bills purchase policy, banks are in need of maximizing their deposits, especially time deposits, as it makes them safe from withdrawal of money by the depositors for a fixed period of time. Time deposit helps banks to freeze their resources for one to five years which would help them minimize the problem of liquidity and maturity mismatch (disparity). This warrants the need for examining the factors that affect time deposit of commercial banks in Ethiopia since it has become an important issue with regard to the NBE bill purchase policy.

1.2. Commercial Banking in Ethiopia

The history of banking in Ethiopia dates back to the turn of the century, when, in1905, the Bank of Abyssinia was established in Addis Ababa, under the reign of Menelek II. As Mauri (2003) stated, this event marked the introduction of banking in the country. The Bank of Abyssinia was given a 50-years concession and was engaged in issuing notes, collecting deposits and granting loans, but its clients were mostly foreign businessmen and wealthy Ethiopians. "A few years later, disappointed by the behavior of this bank, which was mainly devoted to profit-making rather than promoting economic development, the Emperor supported the establishment of a wholly Ethiopian bank, the Société Nationale d'Ethiopie pour le Dévéloppement de l'Agriculture et du Commerce" (Mauri 2003; 15). Thus, 1931 marked the establishment of a new bank, the Bank of Ethiopia, under Government control and the Italian occupation of 1936 brought the liquidation of the Bank.

In 1994, as per the Proclamation of Licensing and Supervision of Banking Business Proclamation No. 84/1994, Awash International Bank S.C was registered as the first private commercial bank in modern Ethiopia banking business by 486 shareholders and by 1998, the authorized capital of the Bank reached Birr 50.0 million. Currently, there are 17 commercial banks and one Development Bank that are operating in the country (See Annex 1).

The banking sector, being the dominant segment within the financial sector, is strictly monitored by the National Bank of Ethiopia and different regulations have been issued at different times in order to guide and monitor the commercial banks. Thus, on April 1,2011, the National Bank of Ethiopia (NBE) issued NBE bills purchase directives subsequent to a lifting of lending caps which has been applied for about two consecutive years (from year 2009-2011) and was revised in 2013. It mainly pertains to purchase of bonds only by privately owned commercial banks from NBE equivalent to 27% of new loan disbursement issued at a concessionary rate of three-percent (NBE, 2011).

The directives state that each bank shall calculate its own allotment based on the monthly plan of loan and advances disbursement. The applicable ratio for the allotment is 27 percent of such disbursement. Thus, all private banks are obliged to allocate the 27 percent of the total loan disbursed during the month for the purchase of the Bill.

As per the NBEs' annual report of 2015/16, simple average minimum savings rate stood at 5.38 percent while average time deposit rate slightly declined to 5.59 percent from 5.77 percent a year earlier. At the same time, simple average lending rate rose to 12.75 percent from 11.88 percent last year (NBE, 2015/16).

1.3. Statement of the Problem

In Ethiopia, privately owned commercial banks are being affected by the provision to buy a 27% National Bank of Ethiopia's Bills based on the amount of loans to be disbursed. Due to this, banks' liquidities positions have been adversely affected. The directive requires private commercial banks to hold 27 percent of the gross loan extension (irrespective of the tenor) in a 5 year NBE bill at an interest rate of 3 percent per annum while deposit rates are around 5 percent (NBE, 2011).

The National Bank of Ethiopia (NBE) imposed another regulation in 2013 on private commercial banks regarding limit on portfolio share of short term loans. Thus, private commercial banks are prohibited from extending medium/long term loans above 60% of their total outstanding loans. In other words, of the total outstanding loans and advances, private banks are expected to maintain a minimum of 40% short term loans and advances. This requirement is directly related to the 27% bill purchase requirement, aimed at keeping the frequency of loan disbursement from going down (NBE, 2013).

As per the IMF (2012), private banks collect savings mostly at two to three-year maturity and even shorter in some cases. When banks issue short-term loans (up to 1 year), they may end up with liquidity problem since they will be required to purchase more bonds as per the number of loans disbursed. Thus, as the frequency of loan disbursement is increased, the frequency and amount of resource flow towards the bill purchase will also increase. Moreover, there is a risk that the deposit may be withdrawn by the depositors anytime during the year. However, in case of long-term loans, there is less risk of liquidity since the money is lent for a longer period of time and there is less frequency of purchasing bills.

Fulfilling the NBE bills requirement creates liquidity and maturity mismatch (disparity) for the banks as the bill is bought for five years and there is a 40% cap for short term loans. Thus, in order to create a win-win situation for the stakeholders involved, banks started to maximize their deposit, especially time deposit since there is a need to freeze bank resources for 5 years. As per the data from the NBE, time deposit of commercial banks has increased from 918 million to 18,965.06 million from the year 2002 to 2016. The NBEs' annual report of 2015/16 stated that simple average minimum savings rate stood at 5.38 percent while average time deposit rate slightly declined to 5.59 percent from 5.77 percent a year earlier. As a result, banks will be more advantageous if they shift to maximizing more time deposits rather than savings, as it makes them safe from withdrawal of money by depositors for a fixed period of time. Moreover, from depositors' perspective, time deposit provides with a higher rate of interest than a regular saving account, until the given maturity date. Thus, as deposit is the most useful liability of the bank, time deposit is a good option for banks with regard to the 27% bill purchase requirement of the NBE.

Even though there are some researches done on banks' deposit practices (Gemedu, 2012; Madebo, 2013; Geleta, 2014; Ayalew et al, 2014; Adem, 2015; Garo, 2015; Tesfahunegn, 2015; Lemma, 2015; Jembere, 2016; Awol, 2016; Alemu, 2016; Amene, 2017, Bayiley and Belay, n.a) and on bill purchase requirement of NBE by (Wolde, 2013; Kebede, 2014; Temesgen, 2015; G/Yohanes, 2015), as to the knowledge of the researcher, it seems that no study appears to have been made in Ethiopia that exclusively investigates the factors affecting time deposit of banking sector in Ethiopia. Hence, filling the knowledge gap, this study attempted to examine the factors that affect time deposit of commercial banks in Ethiopia and tried to suggest the possible ways out. The study is intended to identify and evaluate the bank specific, industry and macro factors that affect time deposit of commercial banks in Ethiopia including the NBE 27% bill requirement.

1.4. Research Questions

Generally the study was conducted to determine the factors affecting time deposit in Commercial Banks in Ethiopia. It addresses the broader research questions of:

- How do bank specific factors like liquidity and profitability affect time deposit of commercial banks in Ethiopia?
- How do industry factors including lending rate and reserve requirement affect time deposit of commercial banks in Ethiopia?
- How do macro factors of inflation and GDP affect time deposit of commercial banks in Ethiopia?
- How does the implementation of the 27% purchase of government bill at lower interest rate affect time deposit?

1.5. Objectives

1.5.1. General Objective

The general objective of the study is to examine the factors that affect time deposit of commercial banks in Ethiopia from the year 2002 to 2016.

1.5.2. Specific Objectives

The specific objectives of the study are to:

- To examine the impact of inflation on time deposit of commercial banks.
- To analyze effects of real GDP on time deposit commercial banks
- To see the impact of liquidity on time deposit in commercial banks.
- To examine the impact of profitability on time deposit in commercial banks.
- To determine effects of lending rate on time deposit of commercial banks.
- To examine the effect of reserve requirement on time deposit of commercial banks.
- To determine the impact of NBE bill purchase policy on time deposit.

1.6. Significance of the Study

This study is important to examine the factors that affect time deposit in commercial banks in Ethiopia. The study will provide information for all stakeholders involved, especially for National

Bank of Ethiopia (NBE) and for all commercial banks in Ethiopia, in order to make informed decisions by minimizing the impact of factors affecting time deposit. It will help them in designing effective strategies since there is a tendency of commercial banks to shift to maximizing time deposit. The study will help the regulatory bodies by providing insight to examine the policy measures in banking supervision pertaining to commercial banks. Additionally, the paper will serve as a spring board for other researchers as well as initiate them to conduct further study on this and related issues.

1.7. Scope and Limitations of the Study

The number of banks engaged in operation in Ethiopia has reached 18 which include 17 commercial banks and 1 development bank. Among these, the study was only limited to the selected six commercial banks in Ethiopia since it requires a lot of time and resource to assess all the existing banks. CBE was selected as it is one of the oldest and highly progressed state owned commercial bank and the experience of the private banks was considered as selection criteria. Hence, the financial statements of the selected banks starting from 2002 to 2016 fiscal years were analyzed. The researcher selected this consecutive 15 years due to the availability of data of all the selected banks during this period.

Banks raise funds by collecting deposits from businesses and consumers via checkable deposits, savings deposits, and time or term deposits and make loans to businesses and consumers. Among the three types of deposits, this research only focused on time deposit as it is currently important for banks to comply with the NBE bill requirement. Moreover, the study was only limited to the selected seven factors that were expected to have a significant impact on time deposit of commercial banks in Ethiopia.

In addition, absence of published literatures on time deposit was one of the major limitations of the study. There are also no written documents or procedures regarding time deposit in the selected commercial banks. However, the researcher used different studies on deposit as time deposit is one of the deposit types.

1.8. Organization of the Paper

The study is organized into five chapters. The first chapter is the introduction part which gives a general introduction about the research issue. It includes background of the study, commercial banking in Ethiopia, statement of the problem, significance, scope, limitations of the study and finally organization of the paper. The second chapter presents the review of related literature. It deals with the theoretical and empirical literatures on time deposit and deposit mobilization respectively and also shows the summary and literature gap. The third chapter deals with research design and methodologies adopted during the course of the study. The fourth chapter is concerned with the findings and discussions of the study. Finally, chapter five offers the summary, conclusion and relevant recommendations based on the research findings.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

The literature review consists of three parts; the theoretical review, the empirical review and summary and the literature gap. The theoretical review part discusses about the role of banks in the financial system, types of deposit by commercial banks and also discusses the variables that are claimed to affect time deposit. The empirical literature part discusses about past studies that

were conducted on the area of factors determining commercial banks deposits since there are no studies conducted on time deposit. The last part shows the summary and literature gap.

2.1.Theoretical Review

2.1.1. Role of banks in the Financial System

The financial system is complex in both structure and function throughout the world. Mishkin and Eakins (2012) stated that the financial system includes many different types of institutions: banks, insurance companies, mutual funds, stock and bond markets. It consist of a set of markets, individuals and institutions which trade in those markets and the supervisory bodies responsible for their regulation and the end-users of the system are people and firms whose desire is to lend and to borrow. (Howells and Bain, 2007)

Madura (2011) grouped financial system into financial market and financial institutions and defines financial markets as a market (commodity market, money market and capital market) in which financial assets (securities) such as stocks and bonds can be purchased or sold and facilitate the flow of funds and thereby allow financing and investing by households, firms and government agencies. Financial institutions are institutions that provide financial services for their customers. It includes banks, insurance, micro finances and others. As stated by Kunt et al (2011), financial institutions provide different financial services from those provided by financial markets.

The term ‘bank’ covers a wide variety of institutions whose principal function is to accept deposits and make loans. Howells and Bain (2007) state that not all deposit-taking institutions are ‘banks’ because insurance companies often hold deposits on behalf of their clients in the course of arranging cover and settling claims and other organizations like building societies, credit unions and friendly societies also hold deposits.

Banks act as delegated monitors and ensure that firms use the resources allocated to them effectively. They also play an important role in sharing risk in the economy by diversifying and smoothing fluctuations over time. However, Franklin and Elena (2008) state that the fixed nature of the claims they issue can cause fragility in the financial system. Banks are often at the center of

financial crisis if there is contagion and small shocks can have a large effect on the financial system and the economy. Banks play an important role in providing fund for firms and helping them and the economy grow.

Banks perform an important role in terms of maturity transformation. They collect demandable deposit and raise funds in the sort-term capital markets and invest them in long-term assets. This maturity mismatch allows them to offer risk sharing to depositors but also exposes them to the possibility that all depositors withdraw their money early. Runs can involve the withdrawals of funds by depositors (retail runs) or drying up of liquidity in the short-term capital markets (wholesale runs). Their roles include the role of banks in the underwriting securities. Other roles include the interaction of banks with financial markets of various types (Franklin and Elena, 2008).

2.1.2. Types of Deposit by Commercial Banks

Commercial Bank deposits are major liabilities for commercial banks. As to Kelvin (2001), deposits of commercial banks account for about 75% of commercial banks' liabilities. Bank deposits serve different purposes for different people. Some people cannot save regularly and instead they deposit money in the bank only when they have extra income. The purpose of deposit then is to keep money safe for future needs. Some may want to deposit money in a bank for as long as possible to earn interest or to accumulate savings with interest so as to buy a flat, or to meet hospital expenses in old age, etc. Some, mostly businessmen, deposit all their income from sales in a bank account and pay all business expenses out of the deposits. Keeping in view these differences, banks offer the facility of opening different types of deposit accounts by people to suit their purpose and convenience. According to Islam & Ghosh (2014), a deposit account is a current account, savings account, time deposit account or other type of bank account, at a banking institution that allows money to be deposited and withdrawn by the account holder. These transactions are recorded on the bank's books, and the resulting balance is recorded as a liability for the bank and represents the amount owed by the bank to the customer.

2.1.2.1.Savings Bank Account

Hana and Petr (2016) defined savings accounts as a deposit on demand characterized by unlimited disposability, high deposit rates and low fees for maintenance and account operations. Savings accounts are non-maturing liabilities that combine the common features of current accounts (withdrawal on a notice) with the common features of long-term deposits (higher deposit rates).

Saving account can be opened with a minimum initial deposit that varies from bank to bank. Money can be deposited any time in this account and withdrawals can be made either by signing a withdrawal form or by issuing a cheque or by using ATM card. Normally banks put some restriction on the number of withdrawal from this account. Interest is allowed on the balance of deposit in the account. A minimum balance has to be maintained in the account as prescribed by the bank. Thus, if a person has limited income and wants to save money for future needs, the saving bank account is most suited for his purpose. Most people as a form of savings maintain these deposits so as to earn interest from the banks. The saving deposits are not only held to meet the needs of the present or the near future but are also kept by individuals as part of their total stock of wealth. (Venkatesan, 2012)

Saving account is a kind of demand deposit with limited number of withdrawals during any specific period. Savings accounts provide principal security and a modest interest rate. Now banks also put some restriction on the minimum balance. If customer don't maintain the minimum balance customer has to pay a penalty. Now saving account comes with many features like ATM and Debit Card, Cheque Book, Free Internet Banking with Bill Pay, Fund Transfer, Prepaid mobile charging, Free Telephone Banking etc (Hana and Petr, 2016).

2.1.2.2.Current Deposit Account

Jhingan (1995) defined current account as a non-interest bearing deposit account that is operated by checks. Depositors in this account can withdraw any account standing to their credit by checks without notice and the bank does not pay any interest on these accounts.

Current accounts are used for day-to-day dealing with money. Big businessmen, companies and institutions such as schools, colleges, and hospitals make payments through their bank accounts. Since there are restrictions on number of withdrawals from savings bank account, that type of account is not suitable for them. They need to have an account from which withdrawal can be made any number of times and banks open current account for them. Like savings bank account, this account also requires certain minimum amount of deposit while opening the account. On this deposit bank does not pay any interest on the balances. Rather the account holder pays certain amount each year as operational charge. For the convenience of the account holders banks also allow withdrawal of amounts in excess of the balance of deposit. This facility is known as overdraft facility. It is allowed to some specific customers and up to a certain limit subject to previous agreement with the bank concerned.

2.1.2.3.Time Deposit Account

Time deposits are savings accounts that are locked in for a specified amount of time. They provide the lowest liquidity and the highest returns (Ledgerwood, 2000). Investors/depositors can withdraw the money only after the time period. Premature withdrawals are also allowed by paying a penalty. Interest is calculated on monthly, quarterly or yearly depends on the bank and scheme. Many banks offer loan or overdraft facility as added features with time deposits. Time deposits are a safe investment and it is therefore a very good option for conservative, low-risk investors.

Time deposits are short-term or long-term liabilities. As to Ismail (2010), period of time deposits varies; it could be less or more than one year. Time deposits with maturities up to one year will be recognized as current liabilities, and deposits with maturities of more than one year are recognized as long-term liabilities

2.1.3. Factors Affecting Time Deposit in Commercial Banks

As to Desinga (1975), an important indicator of the success and efficiency of any banking institution is the extent to which it is able to mobilize the savings of the community in the form of

deposit. A time deposit, as one of the deposit types, is an interest-bearing bank deposit account that has a specified date of maturity. The funds in these accounts must be held for a fixed term and include the understanding that the depositor can make a withdrawal only by giving notice.

Time deposit could be affected by many factors. Dasigna (1975) classified these factors into exogenous and endogenous. The exogenous factors are factors that cannot be controlled by the banking system and are further divided into country specific factors and bank specific/micro/industry factors for clarification purpose. The bank specific factors are factors that are specific to the banking system and the country specific factors are factors that are beyond the banking system. On the other hand, endogenous factors are factors that can be controlled by the banking system which include awareness of the society, convenience of banks' office, services in the bank, location, type of building and window dressing (furniture, cheque books, vouchers, pay slips etc), which assure the customers about the physical fitness of a bank (ibid).

2.1.3.1. Bank-specific Factors

Bank specific factors are factors which can be controlled by the banking system. The bank specific factors in this study include liquidity and profitability measured by return on equity.

Liquidity

Liquidity is a financial term that means the amount of capital that is available for investment. (Ibe, 2013). According to Anyanwu (1993), liquidity simply means the ability to convert an asset to cash with minimum delay and minimum loss/cost. In the portfolio of commercial banks, liquidity assets play a very crucial role because banks operate largely with the funds borrowed from depositors in form of demand and time deposits. These liquidity assets are the essential balance sheet items which have the capacity to maintain the confidence of depositors which is the most valuable intangible asset of the commercial banking business.

Liquidity represents the capacity to fulfill all payment obligations as and when they fall due to their full extent and in the currency required. Nwaezeaku (2006) also defined liquidity as the

degree of convertibility to cash or the ease with which any asset can be converted to cash (sold at a fair market price). Hence, bankers are always sensitive to the issue of liquidity and liquidity risk and the central bank is also there to monitor that banks are liquid enough to meet their respective obligations when the public demands. Liquidity risk is the risk that a given security or asset cannot be traded quickly enough in the market to prevent a loss (or make the required profit). It represent the danger of not being able to fulfill payment obligations, whereby the failure to perform is followed by undesirable consequences. Thus, the more liquid the banks are, the better they attract deposits. As to Finger and Hesse (2009), higher liquidity buffers tend to signal greater bank soundness, which could be a factor favoring deposit demand.

Profitability

Studies show that there is a long run relationship between commercial banks deposits and the profitability of the banks (Erna and Ekki, 2004). As to Finger and Hesse (2009), the increase in profit of banks implies an increased banks deposit. One of the reason as to why people deposit in banks is to ensure a feeling of security of their money. Larger banks in terms of total assets or capital attract better deposit amounts than smaller ones in absolute terms (Finger and Hesse, 2009). This is largely because of the bigger banks have many branches, huge capital and or assets and provide a better sense of security to savers apart from their low transaction costs due to economies of scale.

2.1.3.2. Industry Factors

Industry factors are factors which again cannot be controlled by the banking system. The industry factors in this study include lending rate, reserve requirement and NBE bill purchase requirement all set by the central bank, the National Bank of Ethiopia.

Average Lending Rate

According to Salloum and Hayek (2012), due to competition in the banking industry in the global market, financial institutions are necessitated to offer attractive lending rates to their customers in order to survive. Interest rates offered by commercial banks globally and locally attract customers

to purchase products and services of financial institutions. Commercial banks play a vital role in the economic resource allocation of countries. They channel funds from depositors to investors continuously (Siddiqui, 2012).

Banks issue loans with the money that individuals and institutions have deposited in their different savings, checking, or time deposit accounts (Nyamwange, 2009). Financial institutions give depositors an incentive to leave their money in these accounts, allowing the institution to use it for loans, by paying interest on the money in these accounts. Commercial bank interest rates for these accounts are higher overall when the bank is in greater need of money to lend (Entrop et al, 2012). Banks will also pay higher interest rates for accounts from which customers are less likely to withdraw their money (Nampewo, 2013). This is the reason time deposit, from which depositors cannot withdraw money before a certain date without paying a penalty, pay higher interest rates than regular savings accounts. Hence, Folawewo and Tennant (2008) stated that when the number of borrowers applying for loans increases, bank will charge higher interest rates and vice versa.

Reserve Requirement

A proportion out of the total deposit of commercial banks is reserved at the central bank in accordance with the central bank directives. This reserve neither forms part of the loan able funds nor earns interest and serves as a form of liability to the commercial banks. The central bank uses this reserve amount to facilitate interbank clearance as well as bailing out banks in time of crises. Reserve requirements limit the total expansion of bank deposits that can occur on the basis of any primary increase in deposits. Reserve requirements also have the effect of limiting the reduction in bank credit and deposits that is forced up on the banking system by a primary decrease in deposits. Reserves that are fixed legally can influence the deposits that banks can hold. They also pointed out that reserve requirements determine the maximum amount of loans and investments that each commercial banks and the banking system as a whole may maintain in relation to deposits. Thus, if the reserve requirement is 20 percent of deposits, loans and investment (of the bank's own choosing) may not exceed 80 percent of deposits. As to Diamond and Dybvig (1986), a drastic change like 100% reserve banking would affect even borrowers who currently do not appear to be dependent on banks for liquidity.

NBE Bill

The National bank of Ethiopia (NBE) had issued a directive on April 2011, on the establishment and operation of National Bank of Ethiopia bills Market Directive No.MFA/ NBEBILLS/001/2011 with the aim of increasing the participation of banks in the financing of priority sector projects which is believed to bring sustainable economic development. This NBE bill purchase directive forced all banks except Commercial Bank of Ethiopia and Development Bank of Ethiopia to purchase bond equivalent to 27% of new loan disbursement at interest rate of 3% per annum and a maturity period of five years. The purpose of the directive to draw financial resource from commercial banks to finance and channeling the fund for government priority areas through Development Banks of Ethiopia(DBE). The calculation of the disbursement did not exclude the pre-shipment facility, advance on import bills, merchandise loans which exhibit short term and revolving nature. Following this directive implementation, the private commercial banks are claiming that the directive is negatively affecting the loans and advance position as it create tight liquidity position and reducing earning and profit thereof. Considering this claim, the Ethiopian Bankers' Association (EBA) had appealed to National Bank of Ethiopia (NBE) to revise this directive.

In March 2013, the directive was amended (MFA/NBEBILLS/002/2013). Though the spirit of the directive is the same with the former directive, the NBE tried to address the private banks concern regarding the impacts associated with short maturing loans like pre-shipment export facility, merchandise loan facility and advance on import credit facilities. Yet, the banks are still claiming that it is a bottle neck to the credit process of the banks as the directive dictates the short term loan shall not be less than 40% of the total outstanding loans and advance of the respective bank excluding NBE bills outstanding balance at any given time.

2.1.3.3. Macro Factors

Macro factors are factors that cannot be controlled by the banking system. These are country specific factors which include country's economic, social and political factors. According to Finger and Hesse (2009), country specific risks such as political, economic and financial risks may affect the propensity for depositors to place funds in the banking system. Generally, the success of banks' operation mainly depends on the environment where the business is undertaken. Hence, among the macro factors, the following variables were used in this study.

Inflation

As to Finger and Hesse (2009), inflation is one of the factors that determine commercial banks deposits and also time deposit, as it is one of the deposit types. The rate of inflation determines how much purchasing power, and real value, each unit of currency loses every year. If the annual inflation rate is 5%, then the same amount of money this year is 5% less valuable than it was last year (Kadri, 2012). The classical belief is that, because bank assets and liabilities are expressed in monetary terms and because these assets will normally grow in line with growth in money supply, banks are relatively immune from the effects of inflation (Devinaga, 2010).

The monetary policy works by controlling the cost and availability of credit. When inflation increases, the central bank raises the cost of borrowing and reduce the credit creating capacity of commercial banks which make borrowing more costly than before and thereby the demand for funds will be reduced and the reverse is also true (Devinga, 2010). Namazi and Salehi (2010) also pointed out that the banking system is affected by inflation in terms of deposit absorption and facilities grant and hence, as to Baqui et al (1987), high inflation rates reduce the real value of deposits. Moreover Baqui et al (1987) noted that inflation technically did not decrease deposit however it decreases the value of deposits.

Gross Domestic Product (GDP)

Goossens et al (2007) defined Gross Domestic Product (GDP) as the market value of all final goods and services produced within a geographical entity within a given period of time. It measures the economic performance of a country and is universally applied according to common standards, and has some undeniable benefits mainly due to its simplicity. According to Finger and Hesse (2009), Gross Domestic Product (GDP) is calculated by adding up the value-added at each stage of production and deducting the cost of produced inputs and materials purchased from an industry's suppliers. The authors also stated that growth is one of the determining factors for commercial banks deposits.

2.2.Empirical Review

Literatures on the factors affecting time deposit are relatively scarce or it can be said that there are no literatures or studies regarding the research issue. However, there are many researches on determinants of deposit and deposit mobilization of commercial banks in Ethiopia. Thus, as time deposit is one of the deposit types, the researcher chose to review researches related to deposit and NBE bill policy mostly in Ethiopia.

Mondschean and Opiela (1998) tried to see bank time deposit rates and market discipline in Poland from 1992 to 1996. The researcher examined the impact of ownership structure and changes in the deposit insurance system on the market for bank time deposits in Poland and also examined the degree of the market discipline that depositors impose on banks. Hence, the researchers found out that in an environment of less restrictive bank supervision and a deposit insurance policy that favored state banks, depositors exacted a price for risk taking. They also noted that after a new law increasing coverage for private banks went into effect, bank specific variables became less important in explaining differences in deposit interest rates and reported that the three fully guaranteed state banks pay significantly lower rates than private banks. However, other state-owned banks, with the same de jure guarantee as private banks, pay significantly lower rates than private banks, so depositors treat these state-owned banks as if they have a larger de facto guarantee. The researchers finally recommended that opportunities for private monitoring should be included when designing deposit insurance systems.

Tvalodze and Tchaidze (2011) tried to study deposit formation in Georgia by analyzing the behavior of the real deposits in Georgia in1996–2009 and by modeling demand for the real broad money balances and the cash-deposit ratio. The researchers tried to analyze the deposit formation using a three-step procedure: the money demand, the currency-deposit ratio, and the real deposits which were modeled using the two functional forms. The specification used by the researchers includes variables among the determinants of the M3 demand which were the real GDP, the interest rate on deposits, and CPI inflation. The results revealed that the main factors that affected deposits over those years were income, development of the financial sector, and changes in the tax burden, while changes in the interest rate and inflation played only a minor role. The researchers demonstrate importance of the geopolitical events as they affect confidence in the banking sector.

Finger and Hesse (2009) tried to see the determinants of commercial banks deposit in regional financial sector in Lebanon at the macro and micro level. The researchers estimated a number of macroeconomic models including domestic factors such as economic activity, prices and interest rates, as well as external factors including the business cycle in advanced countries, the availability of funds from the GCC, and global financial market conditions. Thus they found out that both domestic and external variables are significant, and impulse response functions and variance decomposition analysis attach a relatively higher weight to the external factors. In addition, they used a series of panel regressions which pointed to the significance of a number of bank-specific factors, including the banks' perceived riskiness, liquidity buffers, loan exposure and interest margins, in explaining deposit demand at the bank level while macroeconomic factors also play a role.

Boadi et al (2015) tried to examine the effect of interest rate liberalization on bank deposits in a developing country, Ghana. A deposit function model was specified with long term deposit as the main dependent variable with real savings rate, real treasury bill rate, exchange rate movement and gross domestic product as independent variables while controlling for inflation. The researchers used Ordinary Least Squares (OLS) method to estimate the specified model which covered seasonally adjusted quarterly data drawn from Bank of Ghana and Ghana Statistical Service. Thus, the result of this study revealed that the interest rate liberalization and gross domestic product jointly accounted for about 78% of the variation in the level of bank savings deposits in Ghana. The study has also shown that the liberalization of the interest rates has made

it attractive for people with idle funds to save with financial institutions especially the banks. Moreover, the study also revealed a negative relationship between real savings rate and the real treasury bill rate expected in a high inflationary environment. The researchers also found out that both interest rate liberalization and gross domestic product are important determinants of bank deposits though other factors may also counts and gross domestic product proxy by income was a major significant factor of bank deposits determinants with a high coefficient value. Moreover, the study revealed that high inflation and deteriorating foreign exchange rate could keep interest rates high without necessarily impacting on the level of savings. The researchers found all the independent variables of the study to be significant.

Madebo (2013) tried to investigate the determinants of deposit mobilization in the case of Awash International Bank. The researcher used five variables as the determinant factors affecting deposit mobilization. These include reconstruction of Addis Ababa roads, aggressive branch expansion of CBE, the current condominium house construction program, peoples attitude towards using private banks and poor parking area and the result showed that these factors have a strong influence in the deposit mobilization process of Awash International Bank S.C. Furthermore, the researcher indicated that opening of additional branches, aggressive promotion and upgrading service deliverance can boost the deposit balance of a bank positively.

Another researcher Geleta (2014), also tried to investigate the determinants of deposit mobilization in private commercial banks of Ethiopia. Hence, the researcher tried to investigate the impact of five factors namely, bank branches, exchange rate, real gross domestic product, capital adequacy and liquidity on private commercial banks deposits. The empirical results from regression analysis showed that the first three factors have a positive effect on the deposit of private banks whereas the last two factors have a negative effect on deposit of the private banks. The researcher further concluded that better capitalized banks tend to create less liquidity that leads to mobilize little deposit amount. Moreover, the study revealed that endogenous factors like managerial efficiency, government policy, convenience of bank office, technology, bank size and awareness of savings by society have a significant effect on deposit level of the banks.

Garo (2015), have tried to explore the theoretical as well as empirical analysis on the factors that have an impact on deposit volume in banks. The study revealed that the branch expansion, the

money supply, the exchange rate of Birr to USD and general inflation are the most significant factors of deposit mobilization activity. Moreover, the researcher stated that deposit rate and real per capita GDP growth rate have insignificant power to influence deposit volume in banks and that deposit rate have negative relation against the deposit volume.

Alemu (2016) also tried to examine the factors influencing deposit mobilization in private commercial banks in Ethiopia. The study used one dependent variable (total deposit) and seven independent variables namely, number of bank branches, deposit interest rate, liquid asset to deposit ratio, lagged value of bank deposits, net interest margin, inflation rate and economic growth (GDP), which were regressed with the dependent variable. Thus, from regression analysis, the researcher have found out that number of bank branches, deposit interest rate, net interest margin and GDP were significantly and positively correlated with the total deposit. Lagged value of bank deposit was significantly and negatively correlated with total deposit. However, liquid asset to deposit ratio and inflation rate were insignificantly negatively correlated with bank deposit.

Awol (2016), used eight banks to study the determinants of commercial banks' deposit growth. The researcher included seven explanatory variables inflation, deposit interest rate, loan-to-deposit ratio, bank branches, money supply growth, per capita income growth, and lagged bank deposit to see their effect on banks deposit growth. Hence, the researcher have found out that bank branches and per-capita-income growth influence is positively and statistically significant on bank deposit growth; whereas, lagged bank deposit and loan-to-deposit ratio influence is negatively and statistically significant on bank deposit growth. Moreover, the researcher indicated that money supply growth had insignificant negative influence on bank deposit growth; whereas deposit interest rate and inflation had insignificant positive influence on bank deposit growth. He further concluded that stimulation of economic growth, banks presence and financial intermediation are most important factors that affect bank deposit growth.

Bayiley and Belay (n.a) tried to determine the short and long run impacts of endogenous and exogenous factors on deposit growth of Commercial Bank of Ethiopia by using the variables economic growth, inflation, interest rate, exchange rate, population growth and branch expansion. Thus, the result stated that interest rate has positive but insignificant impact on deposit growth both in the long-run and short-run while exchange rate and branch expansion significantly

increases bank deposit contemporaneously both in the short run and long-run. Moreover, the researchers have found out that population and economic growth have a positive relationship with deposit growth but significant only in the long-run. The result also stated that inflation maintains positive and significant impact on deposit in the long-run and negative in the short-run. The researchers further indicated that there is unidirectional causal flow from economic growth to deposit without any feedback response while deposit has a bi-directional causality with branch expansion and economic growth implicating inflation can affect economic growth through investment.

Adem (2015) tried to identify and evaluate those factors affecting bank deposit in general by taking Commercial Bank of Ethiopia by using explanatory variables such as deposit interest rate, overall inflation rate, number of branch opening, gross domestic product, individual foreign remittance and dummy variable. Thus, the researcher has found out that all the explanatory variables were positively correlated with the explained variable. He also indicated that among the variables, branch opening is an important strategy for deposit mobilization and is highly significant than others. Moreover, the researcher indicted that CBE's deposit is also significantly affected by individual remittances from Diasporas.

Gemedu (2012) tried to look at the potential of the country regarding deposit mobilization by taking CBE as an evidence. The secondary data for the study were the values of dependent and independent variables. Three variables were regressed with the dependent variable (total deposit) which include deposit rate, inflation rate and bank branches. As a result of the hypothesis testing, the researcher found that all the three variables can affect total deposit. Branch expansion had positive and significant effect on total deposit whereas deposit rate and inflation rate had positive and insignificant effect on total deposit.

Amene (2017) examined the determinants of savings in private commercial banks of Ethiopia for the 2001-2015 periods and selected six banks based on the historical time formation of banks. The researcher adopted quantitative research approach and analyzed bank specific and macroeconomic variables using the balanced panel fixed effect regression model. The results revealed that disposable income, real GDP growth, branch expansion, are positively and statistically significant on bank deposit growth; whereas, loan to deposit ratio (bank's liquidity) influence is negatively

and statistically significant on bank deposit growth. Deposit rate and profitability had insignificant positive influence on bank deposit growth whereas population growth and capital to loan ratio (capital adequacy) had insignificant negative influence on bank deposit growth. The study implies that stimulation of economic growth is most important factors that affect bank deposit growth.

Jembere (2016) tried to determine factors that affect deposit mobilization, the associated costs of deposit mobilization in private banks by using qualitative and quantitative methods of research. The study used time series data from 2000-2014 for analysis made using classical linear regression method. The study result shows that, age dependency ratio, investment and money supply, are the most significant factors of deposit mobilization activity. The other variable such as per capita income has insignificant power to influence the dependent variable.

The National Bank of Ethiopia (NBE), as the Central Bank of the country, monitors and controls commercial banks in the view of protecting depositors (public) interest. In line with this objective, National Bank issues different proclamation and directives as part of the government monetary policy. The NBE issued a directive on March 2011 which forced commercial banks to allot 27% of the total fund held for loan and advances to purchase government bonds with five years maturity time. Owing to this directive, banks claim that the bill is taking a huge amount of fund that could otherwise have been forwarded as a loan. Thus, some researchers tried to assess the impact of the NBE bill purchase policy on the performance of commercial banks. For instance, Wolde (2013), tried to see the impact of the NBE bill purchase policy on liquidity, profitability & lending capacity of commercial banks in Ethiopia. The result of his study showed that lending capacity and liquidity are significantly affected by the NBE bill purchase policy whereas profitability of banks is affected but the impact is not significant. Moreover, he stated that since banks don't solely relay on income generated from loan and advances, the magnitude of its impact is relatively higher on lending capacity and liquidity.

Another researcher, Temesgen (2015), attempted to assess NBE bill purchase directive and credit performance of new entrant private banks and took a sample of six banks. He tried to assess the relation of the NBE bill purchase directive with liquidity, credit portfolio, asset- liability matching position and credit decision of these banks. It's a type of descriptive research design where the researcher used structured questionnaires to a sample size of 100 respondents and also analyzed

the financial data of these banks effective from the issuance of the directive. Thus, the result of the research indicated that the NBE- bill purchase directive affects the liquidity position of the new entrant private banks as the bill shows steady growth whereas slow pace is exhibited in deposit growth on the other side. The researcher stated that it raises the stiff competition of banks for mobilizing loanable and that the banks are facing challenges as they couldn't satisfy the customers demand. Moreover, the researcher indicated that the NBE bill purchase policy has the effect of increasing the banks short-term portion which in effect raises the frequency and amount of resource flow towards bill purchase.

G/Yohanes (2015) analyzed the relationship between regulations and the performance of private banks in Ethiopia. The researcher assessed the impact of the captioned regulatory measure on the profitability and liquidity of private commercial banks using panel data from 2007-2014 of eight private banks using primary and secondary data source. Multiple linear regression method, correlation, mean and standard deviation was used to analyze secondary data and accordingly, the finding indicated that exposure to government bills has weak negative association with performance and the magnitude is not severe. Moreover, the pre and post policy periods comparison revealed a relatively better profitability record for private banks during times of policy restrictions. In general, the researcher concluded that the effect of the policy measure is mitigated by the excess liquidity standing of banks during the policy formulation, the likely possibility to expand to other fee generating services, stable liability prices and banks discretion to adjust their asset prices. Nevertheless, the researcher stated that the decline trend in the share of loans from the total asset could have negative effect on the long run which in fact to some extent will be moderated by the maturity of part (but significant sum) of the bills in few years' time.

The impact of NBE regulations on private banks performance was also researched by Kebede in 2014. The researcher used bank-specific and macroeconomic variables as control variables and adopted a balanced fixed effect panel regression for the data of six private commercial banks in the sample covered the period from 2004 to 2013. Moreover, the researcher analyzed three regulatory factors affecting banks performance in terms of return on asset and net interest margin and came up with the results which showed that NBE Bill and credit cap have negative and statistically significant impact on banks profitability but reserve requirement has negative and insignificant impact on profitability. Moreover, the NBE Bills, reserve requirement and credit cap

were found to have a negative and statistically significant effect on net interest margin. However, bank size has positive and statistically significant effect on both performance measures, which means ROA & NIM. The researcher also concluded that operating efficiency and GDP have a positive and statistically insignificant effect on ROA but both were statistically significant on NIM and equity has a positive and significant effect on ROA but has negative and statistically insignificant on NIM. Inflation was also found to have a positive and insignificant effect on ROA but had positive and significant effect on NIM.

During Oct 2014, the International Monitory Fund (IMF), commented that the NBE Bill purchase requirement continues to severely constrain private commercial bank operation. The report further noted that in the presence of the reserve requirement, the liquidity requirement and an additional requirement for banks to hold 40 percent of their loans in short term credit will be a major distortion in the financial intermediation. Thus, assessing and understanding the implication of specific and relevant monetary policy instrument on bank performance and timely addressing the issues become important to reduce any unforeseen systemic risk (IMF, 2014).

2.3.Summary and Literature Gap

In summary, all the literatures reviewed regarding commercial banks' deposit show that most of the bank specific, industry and macro factors have an impact on deposit even though their impact is significant or not. From the bank-specific factors, profitability and number of branches were found to have positive but insignificant and significant impacts respectively. On the other hand, liquidity was found to have negative but mostly significant impact on deposit. Of the industry factors, deposit rate was found to have positive but insignificant impact on deposit in all researches. Moreover, from the macro factors, GDP and inflation were found to have positive but mostly insignificant effect on deposit.

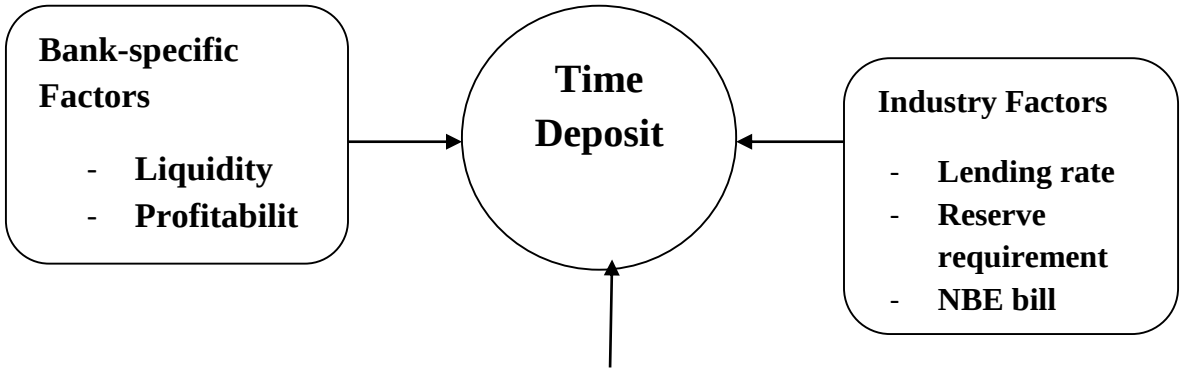
In addition, the studies on NBE bill purchase requirement also revealed that the policy has a significant impact on the profitability and liquidity of banks. This problem will make banks shift to maximizing more time deposit as it makes them safe from withdrawal of money by depositors for a fixed period of time.

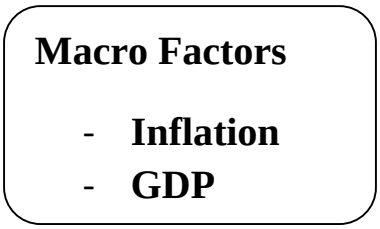
As to the knowledge of the researcher, there is no study regarding time deposit in the country or outside the country. Hence, filling the knowledge gap, this study tried to examine the factors that affect time deposit in commercial banks in Ethiopia evaluating seven factors from the bank specific, industry and macro factors which were expected to have significant effect on time deposit of commercial banks. Profitability and liquidity were selected from the bank specific factors, inflation and GDP were selected from the macro factors and lending rate, reserve requirement and NBE bill were selected from the industry factors.

2.4.Conceptual Framework

Empirical evidence showed that commercial banks deposit is affected by internal and external factors. Accordingly, the study examined the impact seven variables that were expected to have significant effect on time deposit of commercial banks through panel secondary data of 15 years from 2002-2016. Hence, the variables were selected from the bank specific, industry and macro factors where profitability and liquidity were selected from the bank specific factors, inflation and GDP were selected from the macro factors and lending rate, reserve requirement and NBE bill were selected from the industry factors. The dependent variable is time deposit (TD) and the seven independent variables are inflation (INF), average lending rate (ALR), GDP, profitability measured by return on equity (ROE), legal reserve requirement (LRR) and NBE Bills (NBEB). Hence, the conceptual schema of the relationship between the dependent variable and independent variables is depicted here below.

Figure 1: Conceptual framework of the study





Source: Developed by the researcher from different literatures.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1. Research Design

This research is an explanatory type of research aiming to see the factors affecting time deposit in case of Commercial Banks in Ethiopia. It adopted only quantitative approaches in order to reach at the results. Thus, the research was done by using one public commercial bank (CBE) and five selected private commercial banks (AIB, DB, BoA, WB, UB) through panel secondary data (comprising cross-sectional and time series data) of 15 years from 2002-2016.

3.2. Sources of Data

The study was based on secondary sources of data and used panel data to analyze the factors that affect time deposit. The required secondary data were collected from annual reports of the selected six commercial banks from 2002 to 2016 compiled by the National Bank of Ethiopia. Moreover, annual reports of Ministry of Finance and Economic Cooperation (MoFEC) and Central Statistics Agency (CSA) were used to get GDP growth and the Consumer Price Index (CPI) data respectively. Accordingly, the study had 90 observations; fifteen observations for each individual bank.

3.3. Target Population

Currently, there are seventeen commercial banks and one development bank in the Ethiopia. Among these, the Commercial Bank of Ethiopia (CBE), as one of the oldest and highly progressed state owned commercial bank in Ethiopias' banking history, and five private banks were selected from the total private commercial banks.

3.4. Sampling Design and Sample Size

The study adopted a non-probability sampling which is purposive sampling by considering the year of establishment and availability of data of banks to select sample from the total population of seventeen commercial banks and one development bank that are currently operating in the country. The study period was from 2002-2016 and therefore, banks that have started operation after the beginning of this study period were excluded in the study. This period was selected due to the availability of the longer number of observations in this period. Thus, Commercial Bank of Ethiopia, Awash International Bank, Dashen Bank, Bank of Abyssinia, Wegagen Bank, United Bank were included in this study.

3.5. Method of Data Collection

In this study, quantitative data collection method was used. The data were collected from the National Bank of Ethiopia (NBE), which regulates the banking sector of the country and from the selected 6 banks in Ethiopia. The data collection tools that were employed in this study include examination of relevant documents; review of audit reports, NBE consolidated data and publications. Moreover, reports of Ministry of Finance and Economic Cooperation (MoFEC) which regulates the macroeconomic issues of the country and also reports of Central Statistical Agency (CSA) were used as a source of data. The data of the bank-specific factors (liquidity and profitability) and industry factors (reserve requirement, lending rate and NBE bill) were obtained from complied annual report of NBE where as the data of the macroeconomic variables (GDP and inflation) were obtained from MoFEC and CSA respectively. Hence, the study period was from 2002-2016, which was 15 years data of the selected commercial banks in Ethiopia.

3.6. Method of Analysis

The study used quantitative approaches to do the analysis. Quantitative tools such as tables and figures were used. As a main analysis technique, descriptive statistics and regression was employed to identify the major factors that affect time deposit of commercial banks in Ethiopia. Hence quantitative approaches were employed in the research to come up with the thesis report. Moreover, classical linear regression model was used to analyze the relationship between the dependent and independent variables.

3.7. Model Specification and Operational Definition of Variables

3.7.1. Model Specification

This section presents a framework of analysis, and involves adopting a model that would help to demonstrate the responsiveness of certain key variables that affect time deposit of commercial banks in Ethiopia.

The model is consistent with research hypothesis that addresses the bank specific, industry and macro factors for different cross sections. Panel regression model was employed to test the relationship between commercial banks time deposit and the internal and external determinants.

To decompose the model into its actual variables to be estimated, the equation can be presented as below:

$\beta TDR = \alpha_i + \beta_1 * INF_t + \beta_2 * ALR_t + \beta_3 GDP_t * + \beta_4 * LIQ_{it} + \beta_5 * ROE_{it} + \beta_6 * LRR_{it} + \beta_7 * NBEB_{it} + E_{it}$.....

Where:

I=1, 2… N is the i-bank; t=1,2… T corresponds to the year t

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7,$ are vectors of parameters and α_i represents fixed effect.

INF_t: Inflation is measured as percentage change in consumer price index in Ethiopia on the year t.

ALR_t: Average lending rate of the commercial banks on the year t.

GDP_t: Economic growth (GDP) measured as change in the real domestic product/GDP growth of Ethiopia on the year t.

$LIQ_{it:}$ is the ratio of loans over total deposits of the bank i at time t.

ROE_{it}: is the measurement of profitability and used as the ratio of net profit after tax to total equity of the bank i at time t.

LRR_{it} : is the legal reserve requirement of commercial bank i at time t.

$NBEB_{it:}$ is the legal requirement to purchase NBE bills of the bank i at time t.

E_{it}: Is the error term

3.7.2. Operational Definition of Variables

3.7.2.1. Dependent Variable

In this study, the researcher used time deposit of the selected commercial banks as dependent variable. As the primary function of commercial banks is maximization of deposit, banks need to mobilize more deposit or time deposit. Thus, for the successful mobilization of deposit, time deposit is chosen as it gives both the depositor and the bank a better incentive. In this research, the ratio of time deposit is measured by the ratio of total time deposit to total deposit.

3.7.2.2. Independent Variables

The study used bank specific, industry and macro factors as independent variables. Accordingly, the study used seven variables that determine time deposit (TD) which are inflation (INF), average lending rate (ALR), GDP, profitability measured by return on equity (ROE), legal reserve requirement (LRR) and NBE Bills (NBEB).

Thus, the identified variables have the under mentioned measures throughout this research report.

Table 1. Operational definition of the variables and their expected relationship

Variables		**Specification and measurement**	**Notation**	**Expected Sign**
Dependent variable				
1	Time Deposit	Ratio of total time deposit to total deposit	TDR	
Independent variables				
1	Inflation	The yearly change in consumer price index	INF	+
2	GDP	Annual growth rate of gross domestic product	GDP	+
3	Liquidity	The ratio of total loan to total deposit	LIQ	-
4	Profitability	The ratio of net profit after tax to total equity	ROE	+

5	Lending rate	The average banks lending rate of commercial banks	ALR	+
6	Reserve requirement	The ratio of reserve requirement to total deposit	LRR	+
7	NBE bill	Dummy variable, 1 for NBE bill period, o otherwise	NBEB	+

3.8. Literature Driven Hypothesis

3.8.1. Inflation

Inflation is the persistent increase in the general prices of goods and services within an economy over a given period. Finger and Hesse (2009) regarded inflation as one of the factors that determine commercial banks deposits and is seen as an economic problem in developed countries.

Several studies have been conducted to assess the effect of inflation on deposit. (Namazi and Salehi, 2010) found out that total deposit of commercial banks is significantly correlated with the rate of inflation. That is, the more the inflation, the less will be investors inclination to deposit in banks due to the reason that in stabilized conditions of interest rates of banks, investors are apt to engage in usury or purchase of coins and foreign currency rather than depositing. Moreover, they noted that negative correlation between inflation and absorbed deposits and granted facilities has been documented in developing countries and the reverse is true in developed countries.

Garo (2015) tried to see the effect of inflation on deposit. Thus, he has found out that inflation has a positive and significant effect on deposit. Another researchers, Gemedu, 2012; Adem, 2015; Awol, 2016 said that inflation has positive relationship with deposit but the impact is insignificant. Alemu, 2016 also agreed that the impact inflation is insignificant but the relationship is inverse.

However, in this study, the researcher expects to get a positive correlation between inflation and deposit. This is because the increase in inflation will result in an increase in interest rate. Thus, banks will need to mobilize more deposit which will lead to an increase in deposit. As per the NBE bill requirement, banks would want to maximize their time deposit so time deposit will also

increase. Hence, as inflation increases, time deposit will also increase. Accordingly, the following hypothesis was formulated.

H1: Inflation has positive and statistically significant effect on time deposit of commercial banks.

3.8.2. Gross Domestic Product (GDP)

Gross Domestic Product (GDP) is a variable used to measure the economic performance of a country. As per Goossens et.al (2007), GDP has also become the de facto universal metric for 'standards of living'. It also captures the market conditions that have an impact on deposit growth. When the economic performance is good, the demand for loan increases banks to provide more loans. Thus, this will lead commercial banks in mobilizing more deposit. The economic growth plays an important role in banks deposit as it is one of the main sources of banks deposit growth. As stated by Demirguc and Huizinga (1999) the increase in economic growth is an increase the income of individuals and the increase in income increases deposit.

The effect of GDP on deposit has been studied by many researchers. Geleta (2014); Adem, (2015); Garo, (2015) assessed the impact of GDP on deposit and found out that GDP has a positive and insignificant effect on deposit. However, another researcher Alemu (2016) has found out that GDP has positive and significant effect on deposit. In this research, GDP is expected to have a positive and significant effect on time deposit. This is because as GDP increases, the demand for money will increase which also increase deposit since people want to deposit their money into banks. Thus, depositors would want to have a negotiated interest rate which increases time deposit. Accordingly, the following hypothesis was formulated.

H2: GDP has a positive and statistically significant effect on time deposit of commercial banks.

3.8.3. Liquidity

Bank Liquidity simply means the ability of the bank to maintain sufficient funds to pay for its maturing obligations. It is the bank's ability to immediately meet cash, cheques, other withdrawals obligations and legitimate new loan demand while abiding by existing reserve requirements. For the purpose of this research, liquidity positions of commercial banks are used as a measure of bank performance by using the ratio of total loans to total deposit.

There are findings of previous studies that came up with a conclusion that there is negative relationship between liquidity and deposit (Jemeber, 2014; G/Yohanes, 2015; Alemu; 2016). Hence in this study, it is also expected that there is an inverse relationship between liquidity and time deposit. This is because if liquidity increases, there will be excess supply than demand. Thus, commercial banks would not need to mobilize deposit at a higher cost and therefore, time deposit will decrease. Accordingly, the following hypothesis was formulated.

H3: Liquidity has negative and statistically significant effect on time deposit of commercial banks.

3.8.4. Profitability

Profitability is one of the measures of commercial banks performance. (Bologna, 2011) stated that banks must be able to raise deposits at reasonable rates in order to lend to the customers and be profitable. Hence a bank that is able to generate more deposits cheaply will be able to supply more loans competitively and hence make more profits if all other factors are held constant.

The effect of profitability on deposit was also studied by Alemu (2016). The researcher used net interest margin as a measure of profitability and found out that profitability has positive and significance impact on deposit mobilization. Similarly in this study, it is expected that there is a positive relationship between profitability and time deposit. The researcher chose to use return on equity (ROE) as measure of profitability than return on asset (ROA) since ROE is about wealth maximization and ROA is an efficiency measure. Thus, a positive relationship is expected because more profitable banks are likely to win the confidence of depositors for relatively longer term. When investors (depositors) consider paring their fund for longer term, they consider the time variant risks and hence would deposit in profitable banks. Banking is a hugely regulated sector

and depositors are very likely to consider all banks as less risky due to the very high regulation imposed in the sector. This indicates that as profitability increases, time deposit will also increase. Accordingly, the following hypothesis was formulated.

H4: Profitability of banks has positive and statistically significant effect on time deposit of commercial banks.

3.8.5. Lending Interest Rate

Interest rate is the cost of borrowing and also the payment to a borrower of funds to the lenders of the use of money borrowed. A study by Mwangi (2014) shows that the higher interest rates discourage borrowing and encourage savings, and lower interest rate encourage borrowing and economic growth, that is the lower the interest rate, the higher the profit expectation as business are expected to pay certain percentage of the money borrowed (little) as interest for fund borrowed. Conversely, the higher the rate of interest, the lower the profit expectation. Moreover, the study concluded that high rate of interest to the borrowers on lending contributes to banks' failure in higher-risk segments of the credit market.

Hence in this study, it is expected that there is a positive relationship between lending interest rate and time deposit. This is because when lending interest rate increases, commercial banks can enjoy higher profit and this may push them to pay a higher interest rate to mobilize fund which is time deposit. Hence, as the lending interest rate increases, time deposit is expected to increase. Accordingly, the following hypothesis was formulated.

H5: Lending rate has positive and statistically significant effect on time deposit of commercial banks.

3.8.6. Reserve Requirement

Richard and Richard (1959), studied the effect of reserve requirement on deposit. Thus, they stated that reserve requirements determine the maximum amount of loans and investments that each

commercial banks and the banking system as a whole may maintain in relation to deposits. According to them, reserves that are fixed legally positively affects banks deposits. They also limit the total expansion of bank deposits that can occur on the basis of any primary increase in deposits. Moreover, the researchers pointed out that reserve requirements also have the effect of limiting the reduction in bank credit and deposits that is forced up on the banking system by a primary decrease in deposits. (Richard and Richard, 1959).

Hence in this study, it is expected that there is a positive relationship between legal reserve requirement and time deposit. This is because an increase reserve requirement will result in an increase in deposit since banks have to mobilize more deposit (time deposit) to make up for money tied up as a reserve at the central bank. Accordingly, the following hypothesis was formulated.

H6: Reserve requirement has positive and statistically significant effect on time deposit of commercial banks.

3.8.7. NBE Bills

On March 2011, the National Bank of Ethiopia (NBE) issued a directive which requires commercial banks to allot 27% of the total fund held for loan and advances to purchase government bonds with five years maturity time. Thus banks claim that the bill takes a huge amount of fund that could otherwise have been forwarded as a loan and it is affecting their performance. The major source of fund to banks is deposit where banks use this amount to make loans to investors.

Deposits can also be seen as one of the performance measurements of banks. Thus, different studies were conducted to investigate this issue. Accordingly Wolde (2013) found out that the NBE Bill purchase negatively affects liquidity and lending capacity of commercial banks and the impact on profitability is insignificant. The researcher stated that since banks don't solely relay on income generated from loan and advances, the magnitude of its impact is relatively higher on lending capacity and liquidity. G/Yohanes (2015) also indicated that exposure to government bills has weak negative association with performance. Moreover, the researcher concluded that the effect of the policy measure is mitigated by the excess liquidity standing of banks during the policy formulation and other factors. On the other hand, Temesgen (2015) indicated that the NBE- bill purchase directive affects the liquidity position of the banks and it raises the stiff competition of

banks for mobilizing loanable fund. Another researcher (Madebo, 2013) found out that the 27% government bill purchase doesn't affect directly the deposit mobilization process, it affect unconstructively the loan-able balance of the bank.

However in this study, it is expected that there is a positive relationship between NBE bills and time deposit. As discussed in previous chapters, banks are required to purchase NBE bills amounting to 27% every loan disbursed. To comply with this requirement, banks need to mobilize more time deposit as it makes them safe from withdrawal of money for a fixed period of time. Thus, an increase in NBE bills will result in an increase in time deposit. Accordingly, the following hypothesis was formulated.

H7: NBE-Bills have positive and statistically significant effect on time deposit of commercial banks.

3.9. Tests for Model Validity

Diagnostic tests were performed to check for the validity of the parameters. Thus, all the assumptions of the classical linear regression model: normality, multicollinearity, heteroskedasticity and autocorrelation have been checked.

3.9.1. Normality

One assumption of classical linear regression model (CLRM) is the normal distribution of the residual part of the model. As noted by (Gujarati, 2004), OLS estimators are BLUE regardless of whether the error terms are normally distributed or not. If the disturbances are independently and identically distributed with zero mean and constant variance and if the explanatory variables are constant in repeated samples, the OLS coefficient estimators are asymptotically normally distributed with means equal to the corresponding.

However, as per the central limit theorem, if the disturbances are not normally distributed, the OLS estimators are still normally distributed approximately if there are large-sample data. Thus, since the sample size for this study is large enough, it is approximately considered as normally

distributed. This implies that residuals are asymptotically normal in this study. Hence, skewness and kurtosis and Jargue-Bera test have been done.

3.9.2. Heteroskedasticity

According to (Gujarati, 2004) this is a situation whereby the error variances are not constant. This is a violation of one important assumption of the classical linear regression assumptions. Hence, heteroskedasticity was checked using a general test, white test to avoid the problem of misleading conclusions.

3.9.3. Autocorrelation

Auto-correlation assumes that for any two observations the residual terms should be uncorrelated (or independent). In this study, the residuals are not correlated with each other as can be seen on the Durbin-Watson Stat, which tests whether adjacent residuals are correlated. The test statistic can vary between 0 and 4 with a value of 2 meaning that the residuals are uncorrelated. It is also checked using the Breustch-Godfrey Serial Correlation LM test.

3.9.4. Multiplecolliniarity

As Brooks (2008), a problem of multicollinearity occurs when the explanatory variables are highly correlated with each other. If there is no relationship between the explanatory variables, they would be said to be orthogonal to one another and hence, adding or removing a variable from a regression equation would not cause the values of the coefficients on the other variables to change.

Multicolliniarity is another assumption for classical linear regression model. It refers to the existence of a "perfect," or exact, linear relationship among some or all explanatory variables of a regression model (Gujarati, 2004). If it exists the remedy is to drop a variable with a high R-square

or do nothing. Thus, in this research, the correlation matrix was used to check for the violation of this assumption.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1. Introduction

This study is aimed to identify the factors affecting time deposit of commercial banks in Ethiopia by taking the period from 2002-2016. Hence, this chapter presents the descriptive statistics and diagnostics test results of multicollinearity, heteroskedasticity, autocorrelation, normality and also results of the regression analysis.

4.2. Descriptive Statistics

This section presents the descriptive statistics of dependent and explanatory variables used in this study. The dependent variable used in this study was time deposit of commercial banks (TD) and the explanatory variables were inflation (INF), lending rate (ALR), Gross Domestic Product (GDP), liquidity (LIQ), profitability (ROE), legal reserve requirement (LRR), and NBE bill (NBEB). The descriptive statistics includes mean, median, maximum, minimum, standard deviation and others statistics value. The result of the descriptive statistics and its interpretations are presented as follows.

Table 2: Summary of descriptive statistics of study variables over the period of 2002-2016

	TDR	INF	GDP	LIQ	ROE	ALR	LRR	NBEB
Mean	8.813295	13.06085	9.185724	63.81891	26.69843	11.42500	3.041379	0.400000
Median	6.740508	10.57669	10.40000	61.40933	27.15434	11.87500	2.759800	0.000000
Maximum	32.02312	36.40000	12.64421	101.0453	77.70970	12.75000	6.505232	1.000000

Minimum	0.870854	-10.57220	-2.098517	29.75758	-44.22535	10.50000	0.631828	0.000000
Std. Dev.	6.619260	11.58373	3.951972	14.41517	15.59402	0.773236	1.448838	0.492642
Skewness	1.410254	0.386828	-1.927454	0.117038	-0.224125	-0.052722	0.607527	0.408248
Kurtosis	4.692487	3.195000	5.527895	2.554281	8.319764	1.541264	2.742183	1.166667
Jarque-Bera	40.57419	2.387137	79.68963	0.950463	106.8781	8.021356	5.785602	15.10417
Probability	0.000000	0.303138	0.000000	0.621741	0.000000	0.018121	0.055421	0.000525
Sum	793.1966	1175.477	826.7152	5743.702	2402.858	1028.250	273.7241	36.00000
Sum Sq. Dev.	3899.500	11942.27	1390.010	18493.94	21642.44	53.21250	186.8227	21.60000
Observations	90	90	90	90	90	90	90	90

Source: EViews 8 Output descriptive statistics

As shown in the table 2 above, the mean value of time deposit is around 8.8 percent which implies that on average, commercial banks achieved 8.8 percent time deposit from depositors for the period of 2002-2016. The standard deviation for time deposit was 6.62 percent which indicates that time deposit of commercial banks may deviate from the mean value by 6.62 percent ranging from 2.18 percent to 15.42 percent. From the above table, it can also be noticed that the banks time deposit have a minimum and maximum amount of 0.87 percent and 32.02 percent.

Among the bank specific factors, liquidity of commercial banks in Ethiopia on average is 64 percent. Since commercial banking is about financial intermediation, the result shows that much of the asset is held in the form of current asset so as to meet the demand by depositors. And hence, the more liquid commercial banks become, the more they would like to raise long-term finance to the public. The standard deviation shows an amount of 14.41 percent which indicates that there could be a deviation from the average by an amount ranging from 49.4 to 78.22 percent. Moreover, the minimum and maximum values of liquidity of commercial banks in Ethiopia were 29.76 and 101.05 respectively which indicates that the liquidity of banks varies over the sample period. Thus, it can be said that commercial banks with higher liquidity ratio are have more loanable fund and this may resort banks to time deposit to provide long term finance.

Another bank specific factor measured by return on equity was profitability with a mean value of 26.7 which means that the average profitability of banks is 27 percent. This is very high return compared to a risk free proxy, say having rate of 5%. Banking is a very lucrative business and depositors consider all banks as less risky since it is a highly regulated sector. The standard deviation of profitability was found to be 15.59 percent which indicates that profitability of

commercial banks may deviate from the mean value ranging from 11.11 to 42.29 percent. Moreover, the minimum and maximum amounts of profitability of commercial banks range from -44.22 and 77.71 respectively of which a negative amount indicates a loss.

One of the independent variables included in this study was an industry factor which is the lending rate of commercial banks in Ethiopia. As per the result, average lending rate is 11.43 percent which implies that the spread to commercial banks taking saving rate of 5% is 6.43 percent. This is much more than what average depositor gets; 5 percent. The standard deviation was 0.77 which implies that there is low variation of lending rate from the mean value which ranges from 10.66 to 12.20. The data from the NBE shows that the minimum lending rate was 7 percent which was for five consecutive years from 2003-2007 and the maximum lending rate was on 2016 at a rate of 8%. Hence, as per the result shown on table 2 above, the minimum and maximum amount of lending rate was 10.5 and 12.75 respectively which means that on average, banks lend at a minimum of 10.5 percent and a maximum of 12.75 percent.

Another independent variable from the industry factors was reserve requirement. Thus, the result shows that reserve requirement has a mean value of 3.04 which means that 3 percent of commercial banks reserve is at the central bank. This amount is less than the reserve requirement set by the central bank which is 5%. The standard deviation was 1.45 which implies that on average the reserve requirement of the commercial banks ranges from 1.59 and 4.49. The minimum and maximum amount of legal reserve requirement of commercial banks was 0.63 and 6.50 respectively. This however shows that some of the banks meet the requirement set by the central bank.

The last industry factor used in this study was NBE bill purchase by the commercial banks in Ethiopia. This variable however was used as a dummy variable and it has a mean value of 0.4 and minimum and maximum amount of 0 and 1 respectively and also a standard deviation of 0.49.

The mean value of general inflation in the country over the sample period was 13.06% which implies that on average, inflation was 13.06 percent during the study periods. This shows the average increase in price of goods and services within the economy during the study period. The rate of inflation was highly dispersed which exhibits higher dispersion larger than its mean value

over the periods under study towards its mean with standard deviation of 11.58%. The maximum inflation was recorded in the year 2011/2012 which was 36.4 and the minimum was in the year 2001/2002 which was 10.57% which indicates that there more variation from the mean value during the period 2002-2016 in terms of cost of living as measured by consumer price index or inflation.

The other external factor, Gross Domestic Product (GDP) shows a mean value of 9.18 percent which implies that on average, the market value of all final goods and services produced within the country Ethiopia, during 2002-2016 was 9 percent. GDP measures the economic performance of a country. As per table 2 above, the standard deviation for GDP was 3.95 percent which indicates that GDP deviated from 5.23 to 13.13 percent during the study period. The table also shows that maximum amount of GDP was 12.64 percent, which is in 2004/2005 and the minimum amount of GDP was -2.1 percent, which was in 2002/2003.

Skewness measures the asymmetry of the distribution around its mean. Thus, from the result on table 2 above, the skewness has more values greater than zero except in three occasions. This is an indication that the distribution has a long right tail. The kurtosis measures the flatness of the series. The result shows that almost all variables have values nearer to and satisfies that condition 3 except for one variable, profitability measured by ROE. The result from the Jarque-bera test indicates an acceptance of the null hypothesis that the random variables are normally distributed because the JB statistics are greater than critical values at 5% level. The probability value of the model also conform that the null hypothesis of variables being normally distributed as the result there is no reject region.

4.3. Model Validity

This study focused on the relationship between time deposit and the factors affecting time deposit. The researcher used econometric model of multiple regressions which contains one dependent variable, seven independent variables, the constant term and the error term. The model chosen has taken the common classical regression model (CLRM) to analyze the relationship between the dependent and independent variables. Accordingly, all the assumptions of the classical linear

regression model have been checked. Skewness and Kurtosis and Jargue Bera tests have been done to check the normality. Heteroskedasticity was checked using a general test, white test and autocorrelation was checked by using Durbin-Watson and Breustch Godfrey serial correlation LM test. Moreover, multicollinearity test was done by using the correlation matrix to check for the violation of this assumption. As these tests prove the validity of the model, the study continued into regression analysis. Accordingly, the output of the tests which are displayed by EViews8 software are presented and interpreted as follows.

4.3.1. Normality Test

Skewness, Kurtosis and Jargue-Bera tests have been done to test the normality. Normal distribution is not skewed and is defined to have a kurtosis coefficient of Bera-Jarque formalizes this by testing the residuals for normality and testing whether the coefficient of Skeweness and kurtosis are zero and three respectively. Skewness measures the extent to which a distribution is not symmetric about its mean value and kurtosis measures how flat the tails of the distribution are. The Bera-Jarque probability statistics/P-value is also expected not to be significant even at 10% significant level (Brooks, 2008).

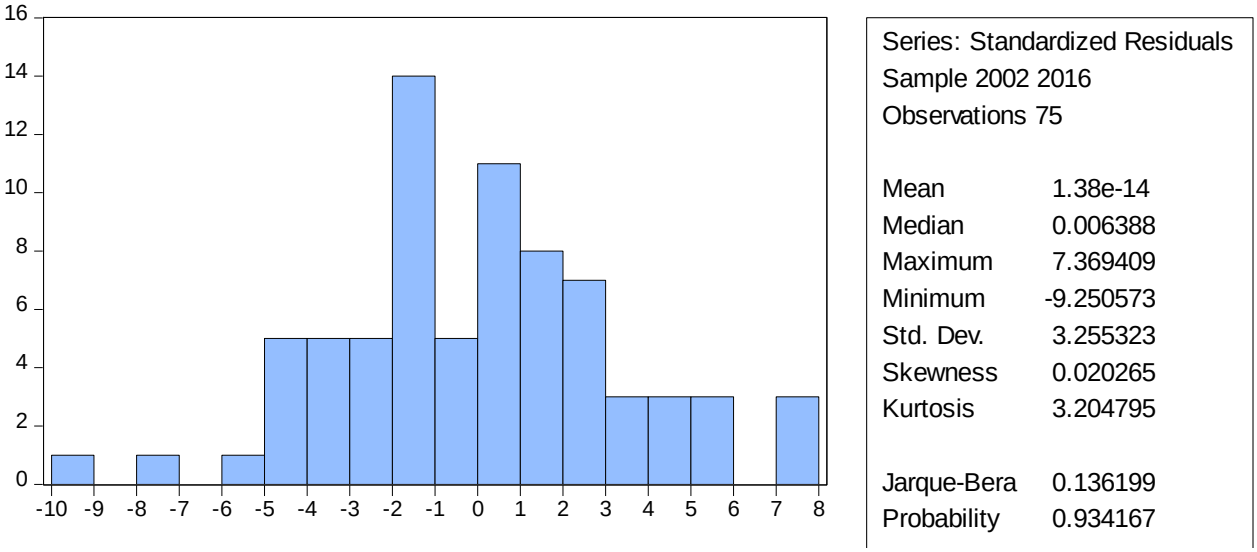


Figure 2: Normality Test Result

Source: EView 8 Output

As shown in the above figure, skewness is 0.020265 which is almost zero and kurtosis is 3.204795 which is almost three and the Jarque-Bera statistics is 0.136199. As stated by Brooks (2008), the p-value given at the bottom of the normality test screen should be greater than 0.05 to fail to reject the null hypothesis at the 5% level. Thus, figure 1 shows that the probability is greater than 0.05 which implies that the P-value has failed to reject the null hypothesis of normality presence.

4.3.2. Heteroskedasticity Test

It has been assumed that the variance of the errors is constant which is known as the assumption of homoscedasticity. If the errors do not have a constant variance, they are said to be Heteroskedasticity. Thus, in this research, the general test that is the white test was used to check for the presence of heteroskedasticity in the residuals. As per Brooks (2008), there is no evidence for the presence of heteroscedasticity if the *p*-values are considerably in excess of 0.05. Thus, the result is presented below.

Table 3: Heteroskedasticity Test: White

F-statistic	1.772907	Prob. F(7,82)	0.1038
Obs*R-squared	11.83060	Prob. Chi-Square(7)	0.1063
Scaled explained SS	23.58340	Prob. Chi-Square(7)	0.0013

Source: EView 8 Output

As shown on table 3, all the p-values of both the F-statistic and Obs*R-squared are greater than 0.05 which indicates the absence of heteroscedasticity. Hence, it can be said that the variance of error term is constant or the second assumption of the classical linear regression model (CLRM) is not violated. (For more details, see Appendix 3)

4.3.3. Autocorrelation Test

The assumption of autocorrelation is that for any two observations the residual terms should be uncorrelated (or independent). This eventuality is sometimes described as a lack of autocorrelation. The researcher used and tested this with the Durbin–Watson (DW) test and Breusch-Godfrey Serial Correlation LM test, which are tests for serial correlations among errors.

Durbin-Watson (DW) tests only for a relationship between an error and its immediately previous value. As Brooks (2008) stated, Durbin-Watson (DW) is approximately equals to two, when there is no autocorrelation between the error term and its first order lag (Brooks, 2008). The null hypothesis for the DW test is no autocorrelation between the error term and its lag. Thus the DW test shows 1.9829 which virtually mean the residuals are uncorrelated.

Another test, the Breusch-Godfrey Serial Correlation LM Test is also used since the Durbin Watson test is not reliable when lagged values are used in the model. This test is much more general in that it allows for both AR and MA error structures as well as the presence of lagged regress and as an explanatory variable (Gujarati, 2004). The null hypothesis is that there is no serial correlation. The summary statistic is depicted here below:

Table 4: Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.511721	Prob. F(5,74)	0.7666
Obs*R-squared	2.974399	Prob. Chi-Square(5)	0.7039

Source: EView 8 Output

As shown on table 4 above, the Breush-Godfrey Serial Correlation LM Test gives an F-statistic of 0.511721 with a probability of 0.7666 and Obs*R-squared gives statics of 2.974399 with probability Chi-Square of 0.7039. Hence, from both tests, since the p-values are greater than 0.05, it can be concluded that the residuals are not correlated. (For more details, see Appendix 4)

4.3.4. Multicollinearity Test

The test for multicollinearity was done by using correlation matrix. Correlation is a way to index the degree to which two or more variables are associated with or related to each other. Thus, the result of the test for the existence multicollinearity between independent variables is presented in the test analysis using only independent variables as shown under on Table 5.

Table 5: Correlation Matrix (Only Independent Variables)

	GDP	INF	LRR	LIQ	ALR	NBEB	ROE
GDP	1.00						
INF	0.28	1.00					
LRR	0.22	0.20	1.00				
LIQ	-0.18	-0.14	-0.23	1.00			
ALR	0.18	0.33	0.60	-0.48	1.00		
NBEB	0.13	0.15	0.62	-0.38	0.63	1.00	
ROE	0.38	0.31	-0.04	-0.33	0.13	0.20	1.00

Source: EView 8 Output

As to Lewis (1995), in order to find out the multicollinearity problem, the correlation among the independent variables should be less than 0.8, that is, the existence of correlation of about 0.8 or more indicates a problem of multicollinearity. Thus, as shown on the correlation matrix on table 5 above, all the figures are below 0.8 which indicate that there is no problem of mulicollinearity. Therefore, all the variables were retained for use in the estimations.

4.4. Interpretation, Analysis and Discussion

"Regression is concerned with describing and evaluating the relationship between a given variable and one or more other variables" (Brooks 2008, p.27). Thus, in this research, the regression analysis was used to test if an independent variable influences a dependent variable and whether the effect is positive/negative and therefore, one dependent variable and seven independent variables were regressed using econometric software called EViews8. The dependent variable is time deposit of commercial banks(TD) and the seven independent variables are inflation rate (INF), lending rate (ALR), Gross Domestic Product (GDP), liquidity (LIQ), profitability (ROE), legal reserve requirement (LRR), and NBE bill (NBEB). The regression by ordinary least square method was done with the data of successive 15 years from the 2002 to 2016. This section presents the regression result of pooled panel regression model that examines the factors affecting time deposit in commercial banks in Ethiopia.

Operational model: the operational panel regression model used to find the statistically significant factors that affect time deposit in commercial banks in Ethiopia.

$$\beta TDR = \alpha_i + \beta_1 * INF_t + \beta_2 * ALR_t + \beta_3\, GDP_t * + \beta_4 * LIQ_{it} + \beta_5 * ROE_{it} + \beta_6 * LRR_{it} + \beta_7 * NBEB_{it} + E_{it}$$

Accordingly, Table 6 below presents the result of pooled panel regression model that examines the impact of explanatory variables on time deposit. Hence, TDR is dependent variable whereas inflation rate (INF), average lending rate (ALR), Gross Domestic Product (GDP), liquidity (LIQ), profitability (ROE), legal reserve requirement (LRR), and NBE bill (NBEB) are explanatory variables.

Table 6: Results of pooled panel regression model

Dependent Variable: TDR

Method: Panel Least Squares

Date: 05/23/17 Time: 19:38

Sample (adjusted): 2003 2016

Periods included: 14

Cross-sections included: 6

Total panel (balanced) observations: 84

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	16.92887	8.653541	1.956294	0.0542
GDP	0.021001	0.105917	0.198279	0.8434
INF	0.023362	0.037443	0.623921	0.5346
LRR	0.059689	0.352541	0.169311	0.8660
LIQ	0.073912**	0.034178	2.162547	0.0338
ALR	-1.891946***	0.697359	-2.713015	0.0083
NBEB	2.679708**	1.048911	2.554752	0.0127
ROE	0.011210	0.032557	0.344320	0.7316

R-squared	0.767289	Mean dependent var	8.568132
Adjusted R-squared	0.742466	S.D. dependent var	6.386158
S.E. of regression	3.240835	Akaike info criterion	5.290496
Sum squared resid	787.7258	Schwarz criterion	5.550941
Log likelihood	-213.2008	Hannan-Quinn criter.	5.395193
F-statistic	30.91094	Durbin-Watson stat	2.122114
Prob(F-statistic)	0.000000		

Note: *** significant at 1%, ** significant at 5%,* significant at 10%

Source: EView 8 Output

Based on the regression result, the relationship between the variables included in the model can, therefore, be represented as follows;

$$TDR = 0.0233*INF_t - 1.891*ALR_t + 0.021\ GDP_t * +0.0739*LIQ_{it} + 0.0112*ROE_{it} + 0.0596*LRR_{it} + 2.679*NBEB_{it} + 16.9288$$

Where the dependent variable is time deposit (TDR) and independent variables are inflation rate (INF), average lending rate (ALR), Gross Domestic Product (GDP), liquidity (LIQ), profitability (ROE), legal reserve requirement (LRR), and NBE bill (NBEB).

Interpretation of R-squared

As per Brooks (2008), R-squared tells how well the model containing the explanatory variables that were proposed actually explain variations in the dependent variable. Thus, table 6 shows R-squared coefficient of 0.767289 obtained from the estimated model revealing that 76.7 percent of variation in time deposit (TDR) is explained by the selected explanatory variables inflation rate (INF), average lending rate (ALR), Gross Domestic Product (GDP), liquidity (LIQ), profitability (ROE), legal reserve requirement (LRR), and NBE bill (NBEB). The R-square result is valid because the researcher only included the above seven variables of the bank specific, industry and macro factors. These and other remaining factors can account for the remaining 23.27 percent.

Interpretation of Adjusted R-squared

Adjusted R2 is a modification to R2 which takes into account the loss of degrees of freedom associated with adding extra variables (Brooks, 2008). In this research, Adjusted R2 was inferred to see how much of the variables could be explained by the factors. Thus, the result shows satisfactory levels, which mean that nearly 74 percent of the volatilities in time deposit are explained by the volatilities of independent variables included in the equation. Therefore, an adjusted R-square having value of 0.742466 shows that approximately 74 percent of dependent variable is explained by the independent variables included in the model and the remaining 26% is unexplained.

Inflation Rate

As to Finger and Hesse (2009), inflation is the persistent increase in the general prices of goods and services within an economy over a given period. The inflation rate is the rate at which the price level increases. According to them, price can also determine commercial banks' deposit and it can be indicated by consumer price index. As shown on table 6, inflation rate has positive and insignificant impact on time deposit. Inflation is supposed to have positive effect on time deposit. This is because the increase in inflation will result in an increase in interest rate. Thus, banks will need to mobilize more deposit which will lead to an increase in deposit. Hence, as inflation increases, time deposit will also increase. The coefficient of this relationship of 0.023362 indicates that holding other things constant, a unit increase in inflation rate will lead to a 0.023 unit increase in time deposit but the relationship is statistically insignificant at 5% significance level. The result is consistent with previous studies like Gemedu (2012); Adem (2015) and Awol (2016) who found out that the impact of inflaton on deposit is positive and insignificant. However, the finding is different from a study by Garo (2015) who has found out that inflation has positive and significant effect on deposit. Contrary to this, Alemu (2016) found out that inflation has negative and insignificant effect on deposit.

Lending Rate

The coefficient of the average lending rate is -1.9 and it is significant at 99% confidence interval. As shown on table 6, the coefficient value indicates that holding other things constant, when average lending rate increase by 1%, time deposit as a ratio of total deposit would decrease by 1.9%. The finding is in contradiction to the hypothesized sign. The expectation was when average lending rate increases, commercial banks' demand for fund would go up in order to enjoy the higher spread and hence would mobilize more time deposit. This inverse relationship can be explained by as lending interest rate goes up, commercial banks can enjoy a higher profit. The high profit may not push commercial banks to pay a higher interest rate to mobilize fund. Another possible explanation can be when average lending rate goes up, demand for loan would go down. If demand is low, commercial banks would not mobilize deposit at higher interest rate (time deposit). A study by Mwangi (2014) in Kenya showed that the higher interest rates discourage

borrowing and encourage savings, and lower interest rate encourage borrowing and economic growth so lending rate has positive effect on deposit. There is no study in Ethiopia on the effect of lending rate on deposit. Studies were conducted on the deposit rate by Gemedu, 2012; Geleta, 2014; Ayalew et.al, 2014; Adem, 2015; Garo, 2015; Tesfahunegn, 2015; Jembere, 2016; Awol, 2016; Madebo, 2013; Alemu, 2016 and Amene, 2017.

Gross Domestic Product (GDP)

GDP has positive effect on time deposit but the relationship is statistically insignificant at 5% significance level. This is against the expectation since when the economy grows, deposit in general, time deposit in particular will increase. This is due to the increase in income of citizens which comes along with economic growth. However, the insignificant relationship may signal that the increase in income may not be high enough to exceed subsistence. If the extra income is used to cover basic needs, time deposit may not increase. This result is consistent with previous studies like Geleta (2014); Adem, (2015); Garo, (2015) who found out that the impact of GDP on deposit is positive and insignificant. However, the finding is different from a study by Alemu (2016) who found out that GDP has positive and significant effect on deposit.

Liquidity

Liquidity has positive and significant effect (at 5%) on time deposit of commercial banks. As shown on table 6 above, when liquidity increases by 1%, time deposit as a proportion of total deposit of commercial banks would increase by 0.07%. Commercial banks with higher liquidity ratio are expected to have more loanable fund. However, this may not trigger them to raise more time deposit. More liquidity therefore is expected to lead to smaller time deposit. The finding shows that the more liquid commercial banks become, the more they would like to raise long-term finance. The liquidity could mainly be from short-term sources that cannot be lent out for long-term. In order to provide long-term finance to the general public, commercial banks would resort to time deposit. This finding is in contradiction to the hypothesis and the findings of previous studies that came up with a conclusion that there is negative relationship between liquidity and deposit (Jemeber, 2014; G/Yohanes, 2015; Alemu; 2016).

Profitability

Profitability as measured by return on equity is found to have positive but insignificant effect on time deposit. Profit was expected to have positive and significant effect on time deposit. This was hypothesized since more profitable banks are likely to win the confidence of depositors for relatively longer term. When investors (depositors) consider paring their fund for longer term, they consider the time variant risks and hence would deposit in profitable banks. As expected the coefficient was positive but the effect is insignificant in statistical terms at 5% significance level. Banking is a hugely regulated sector and depositors are very likely to consider all banks as less risky due to the very high regulation imposed in the sector. This, therefore may not a very critical consideration in picking a bank to make time deposit. This result is consistent with previous studies like Alemu (2016) and Amene (2017) who found out that profitability have positive and insignificant effect on deposit.

Reserve Requirement

Central banks set some reserve requirement on deposit of commercial banks. The reserve requirement is expected to be a buffer to protect the interest of depositors. More deposit is accompanied by more reserve. The finding of this study shows that there is positive but insignificant effect of legal reserve requirement on time deposit of commercial banks. This is in congruence with the hypothesized nature of relationship. During the study period, there has been credit cap (2008-2010) and NBE bill requirements (2011 – to date). Both reduce the interest of commercial banks from raising deposit; whatever form it takes. Richard and Richard (1959), studied the effect of reserve requirement on deposit. Thus, they stated that reserve requirements determine the maximum amount of loans and investments that each commercial banks and the banking system as a whole may maintain in relation to deposits. According to them, reserves that are fixed legally positively affect banks deposits. The finding is consistent with this study but it is statistically insignificant.

NBE Bill

As expected, NBE bill requirement is found out to have positive and significant effect on time deposit of commercial banks at 5% significance level. As shown on table 6, the 2.7 coefficient indicates that time deposit as a proportion of total deposit is 2.7% more after the introduction of the NBE bill compared to prior to that period. The finding is in line with the expected values. The NBE bill requirement is levied on any disbursement commercial banks can make and the bill pays less than the weighted average cost of raising fund. It is in the best interest of commercial banks to provide long-term loan so as they can avoid parking much of their fund in short-term loan. The finding is different from the study conducted by Temesgen (2015) who indicated that the NBE-bill purchase directive affects the liquidity position of the banks and it raises the stiff competition of banks for mobilizing loanable fund. This implies that the bill requirement decreases deposit in general; demand, saving and time alike. Another researcher Madebo (2013) found out that the 27% government bill purchase doesn't affect directly the deposit mobilization process, it affect unconstructively the loan-able balance of the bank. This finding again is in contradiction to the finding in this study.

4.5. Result Vs Hypothesis

The finding in this study revealed that most of the variables' result is as per the hypothesized sign except for liquidity and lending rate. The hypothesized sign and effect against the result is discussed hereunder.

H1: Inflation has positive and statistically significant effect on time deposit of commercial banks.

The researcher expected to get a positive correlation between inflation and deposit because the increase in inflation will result in an increase in interest rate and thus, banks will need to mobilize more deposit which will lead to an increase in deposit. As per the NBE bill requirement, banks would want to maximize their time deposit so time deposit will also increase. The result is

consistent with the hypothesized sign but the impact of inflation on time deposit is found to be insignificant and therefore, the hypothesis formulated is rejected.

H2: GDP has a positive and statistically significant effect on time deposit of commercial banks.

In this research, GDP was expected to have a positive and significant effect on time deposit. This is because as GDP increases, the demand for money will increase which also increase deposit since people want to deposit their money into banks. Thus, depositors would want to have a negotiated interest rate which increases time deposit. However, the finding shows that GDP has positive and insignificant effect on time deposit and accordingly, the hypothesis formulated is rejected due to the insignificant effect of GDP on time deposit.

H3: Liquidity has negative and statistically significant effect on time deposit of commercial banks.

Liquidity was expected to have an inverse relationship with time deposit. However, the result revealed that liquidity and time deposit have a positive relationship which is in contradiction to the hypothesis. The finding shows that the more liquid commercial banks become, the more they would like to raise long-term finance. The liquidity could mainly be from short-term sources that cannot be lent out for long-term. In order to provide long-term finance to the general public, commercial banks would resort to time deposit. Accordingly, even though liquidity has significant effect on time deposit, the hypothesis formulated is rejected due to the positive correlation between liquidity and time deposit.

H4: Profitability of banks has positive and statistically significant effect on time deposit of commercial banks.

A positive correlation was expected between profitability and time deposit because more profitable banks are likely to win the confidence of depositors for relatively longer term. When investors (depositors) consider paring their fund for longer term, they consider the time variant risks and hence would deposit in profitable banks. The finding also revealed that profitability has positive correlation with time deposit but the hypothesis formulated is rejected due to the insignificant impact of profitability on time deposit.

H5: Lending rate has positive and statistically significant effect on time deposit of commercial banks.

The researcher expected that there is a positive relationship between lending interest rate and time deposit. This is because when lending interest rate increases, commercial banks can enjoy higher profit and this may push them to pay a higher interest rate to mobilize fund which is time deposit. However, the result showed that lending rate has an inverse relationship with time deposit which could be explained as when average lending rate goes up, demand for loan would go down and if demand is low, commercial banks would not mobilize deposit at higher interest rate and therefore time deposit will decrease. Accordingly, the hypothesis formulated is rejected due to the inverse relationship between lending rate and time deposit.

H6: Reserve requirement has positive and statistically significant effect on time deposit of commercial banks.

In this study, it was expected that there will be a positive relationship between legal reserve requirement and time deposit. This is because an increase reserve requirement will result in an increase in deposit since banks have to mobilize more deposit (time deposit) to make up for money tied up as a reserve at the central bank. The finding is consistent with the hypothesized sign but the effect is insignificant and accordingly, the hypothesis formulated is rejected.

H7: NBE-Bills have positive and statistically significant effect on time deposit of commercial banks.

In this study, it was expected that there will be a positive relationship between NBE bills and time deposit. As banks are required to purchase NBE bills amounting to 27% every loan disbursed, they need to mobilize more time deposit as it makes them safe from withdrawal of money for a fixed period of time. Thus, an increase in NBE bills will result in an increase in time deposit. The result also revealed that NBE bill and time deposit have positive and statistically significant effect on time deposit of commercial banks. Accordingly, the hypothesis formulated is not rejected.

The summary of the result against the hypothesis is presented under the table below.

Table 7: Summary of the Result against the Hypothesis

Variables	Hypothesis No.	Hypothesis	Actual Result	Hypothesis Status
Inflation	H1	Positive Significant	Positive Insignificant	Reject
GDP	H2	Positive Significant	Positive Insignificant	Reject
Liquidity	H3	Negative Significant	Positive Significant	Reject
Profitability	H4	Positive Significant	Positive Insignificant	Reject
Lending rate	H5	Positive Significant	Negative Significant	Reject
Reserve requirement	H6	Positive Significant	Positive Insignificant	Reject
NBE Bill	H7	Positive Significant	Positive Significant	Fail to reject

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This study was conducted to find out the major factors that affect time deposit of commercial banks in Ethiopia. Thus, an explanatory research design was adopted to explain the causal relationships between the variables. The study employed quantitative methods on secondary data sourced from financial statements of banks compiled by NBE and annual reports of Ministry of Finance and Economic Cooperation (MoFEC) and Central Statistics Agency (CSA). On the basis of the findings discussed earlier on Chapter four, the summary, conclusions and recommendations are presented below.

5.1. Summary of Major Findings

In this research, the dependent variable time deposit of commercial banks (TD) and the independent variables; inflation rate (INF), Gross Domestic Product (GDP), liquidity (LIQ), profitability (ROE), lending rate (ALR), reserve requirement (LRR), and NBE bill (NBEB) were regressed using econometric software called EViews8. Thus, the results from the regression analysis estimated by pooled panel regression model showed that liquidity and NBE bill have positive and statistically significant effect on time deposit where as Gross Domestic Product (GDP), inflation, profitability and reserve requirement have positive but insignificant effect on time deposit of commercial banks. Contrary to this, lending rate is found to have negative and significant effect on time deposit of commercial banks. In this research, GDP, inflation and reserve requirement were expected to have positive and significant effect on time deposit but the study revealed that even though they positive effect, their impact is insignificant.

5.2. Conclusion

The study tried to examine the factors that affect time deposit of commercial banks in Ethiopia. Hence, on the basis of the major findings shown above, the following conclusions can be drawn.

- Liquidity has positive and statistically significant effect on time deposit. This shows that the more liquid commercial banks become, the more they would like to raise long-term

finance. The liquidity could mainly be from short-term sources that cannot be lent out for long-term. In order to provide long-term finance to the general public, commercial banks would resort to time deposit. Thus, it can be concluded that fulfilling the NBE bills requirement creates liquidity mismatch (disparity) for the banks as the bill is bought for five years and there is a 40% cap for short term loans.

- NBEB have positive and statistically significant effect on time deposit. The NBE bill requirement is levied on any disbursement commercial banks can make and the bill pays less than the weighted average cost of raising fund. Thus, it is in the best interest of commercial banks to provide long-term loan so as they can avoid parking much of their fund in short-term loan. From the finding, it can be concluded that the bill requirement decreases deposit in general; demand, saving and time deposit.
- Lending rate is found to have an inverse relationship but statistically significant impact on time deposit of commercial banks in Ethiopia. This shows that when average lending rate goes up, demand for loan would go down and if demand is low, commercial banks would not mobilize deposit at higher interest rate (time deposit). Thus it can be concluded that when lending interest rate increases, people would not want to take loans at a higher interest rate and thus, there is no need for banks to mobilize more deposit or time deposit.
- Among the macroeconomic variables, inflation was proved to have positive but statistically insignificant impact on time deposit of commercial banks in Ethiopia. This is because the increase in inflation will result in an increase in interest rate and thus, banks will need to mobilize more deposit which will lead to an increase in deposit. Therefore, it can be concluded that as inflation increases, time deposit will also increase.
- Gross Domestic Product (GDP) was proved to have positive but statistically insignificant impact on time deposit of commercial banks in Ethiopia. This is due to the increase in income of citizens which comes along with economic growth. However, the insignificant relationship may signal that the increase in income may not be high enough to exceed subsistence. If the extra income is used to cover basic needs, time deposit may not increase. Thus, it can be concluded that the increase in GDP will also increase the demand for loan and deposit, specifically, time deposit of banks.
- The impact of reserve requirement on time deposit is found to be positive but statistically insignificant. As reserve requirement is expected to be a buffer to protect the interest of

depositors, more deposit is accompanied by more reserve. During the study period, there has been credit cap (2008-2010) and NBE bill requirements (2011 – to date). Both reduce the interest of commercial banks from raising deposit; whatever form it takes. Thus, it can be concluded that the increase in reserve requirement will result in an increase in deposit since banks have to mobilize more deposit (time deposit) to make up for money tied up as a reserve at the central bank.

- The effect of profitability as measured by return on equity has positive but statistically insignificant impact on time deposit of commercial banks in Ethiopia. This shows that more profitable banks are likely to win the confidence of depositors for relatively longer term. Thus, it can be concluded that when investors (depositors) consider paring their fund for longer term, they consider the time variant risks and hence would deposit in profitable banks.

5.3. Recommendations

The following recommendations are suggested as possible solutions on the basis of the major findings and conclusions.

- The study showed that fulfilling the NBE bills requirement creates liquidity and maturity mismatch (disparity) for the banks as the bill is bought for five years and there is a 40% cap for short term loans. Thus, banks need to freeze their resources for one to five years in order to minimize the problem of liquidity and maturity mismatch (disparity). Therefore, it can be said that time deposit is a good option for banks as it makes them safe from withdrawal of money by depositors for a fixed period of time and minimizes liquidity and maturity mismatch (disparity). More liquid banks would hold more time deposit. Thus by doing a study on asset-liability match and maturity match, commercial banks should lend out their liquidity while mobilizing more time deposit.
- NBE bill has positive effect on time deposit. Commercial banks would like to reduce the rate of rotating loan within themselves in order to reduce their investment in NBE bill. That can make it hard for businesses to finance working capital and other short-term needs. NBE

should consider applying the NBE bill purchase requirement on loan balance than flow of loan.

- Lending rate has negative and significant effect on time deposit. As long as commercial banks maximize their overall return from intermediation (taking deposit and providing loan), they can play with their lending rate to gain a competitive advantage to mobilize more time deposit.
- Banks should consider the macroeconomic indicators (inflation and GDP) as they have positive effect on time deposit of commercial banks. Even though the impact of these factors is insignificant, banks should consider them when preparing different strategies of mobilizing deposit; time deposit, as it is one of the types of deposit.
- Time deposit is one of the risk-free investments and also a good option for depositors as it provides them with a higher rate of interest than a regular saving account until the given maturity date. Thus, banks should make the society aware of the different advantages time deposit has to offer and that way, both the depositor and the banks will mutually be benefited.

Areas of further research; the study used seven independent variables to identify the factors affecting time deposit. Thus, the researcher recommends other researchers to identify other variables and study the factors affecting time deposit.

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APPENDICES

Appendix 1: Raw Data

Bank	Year	TD	TOD	LA	ROE	GDP	RR	INF	ALR	NBEB
CBE	2002	492.00	17,853.00	9,751.00	(44.23)	1.63	407.00	(10.57)	10.75	0
CBE	2003	383.00	19,135.00	8,553.00	51.76	(2.10)	657.00	10.92	10.50	0
	2004	373.00	22,406.00	8,325.00	24.09	11.73	624.00	7.35	10.50	0

CBE										
CBE	2005	407.00	24,934.00	9,556.00	39.11	12.64	677.00	6.13	10.50	0
CBE	2006	1,405.00	28,127.00	9,296.00	54.65	11.54	886.00	10.58	10.50	0
CBE	2007	301.00	32,795.00	9,759.00	30.18	11.79	220.00	15.82	10.50	0
CBE	2008	327.73	37,633.28	17,338.53	31.00	11.19	556.17	25.30	11.50	0
CBE	2009	521.21	43,489.41	20,906.06	40.01	10.04	1,036.46	36.40	12.25	0
CBE	2010	994.09	54,646.21	24,016.97	37.15	10.57	1,528.47	2.80	12.25	0
CBE	2011	1,564.00	84,798.54	35,981.19	48.46	11.40	2,231.33	18.10	11.88	1
CBE	2012	7,409.76	116,584.46	62,314.37	77.71	8.70	3,588.46	34.10	11.88	1
CBE	2013	8,790.27	152,386.03	71,544.58	72.83	9.90	962.82	13.50	11.88	1
CBE	2014	9,671.04	192,275.22	87,261.79	67.65	10.35	2,633.94	8.10	11.88	1
CBE	2015	13,527.00	241,733.00	111,436.00	47.34	10.40	2,634.00	7.70	11.88	1
CBE	2016	12,160.00	288,460.00	138,800.00	44.71	8.00	4,975.00	9.69	12.75	1
AIB	2002	51.00	930.00	637.00	10.21	1.63	17.00	(10.57)	10.75	0
AIB	2003	44.00	1,164.00	800.00	10.45	(2.10)	19.00	10.92	10.50	0
AIB	2004	65.00	1,493.00	946.00	17.81	11.73	23.00	7.35	10.50	0
AIB	2005	81.00	1,940.00	1,290.00	19.84	12.64	32.00	6.13	10.50	0
AIB	2006	160.00	2,567.00	1,872.00	29.32	11.54	43.00	10.58	10.50	0
AIB	2007	286.00	3,112.00	2,512.00	38.78	11.79	67.00	15.82	10.50	0
AIB	2008	252.75	3,869.53	2,737.88	27.71	11.19	98.59	25.30	11.50	0
AIB	2009	180.54	4,962.41	2,713.00	21.23	10.04	152.05	36.40	12.25	0
AIB	2010	61.96	6,105.94	3,145.69	29.29	10.57	213.94	2.80	12.25	0
AIB	2011	82.18	7,743.78	3,986.46	32.08	11.40	304.10	18.10	11.88	1
AIB	2012	481.06	9,204.36	5,504.61	27.03	8.70	402.71	34.10	11.88	1

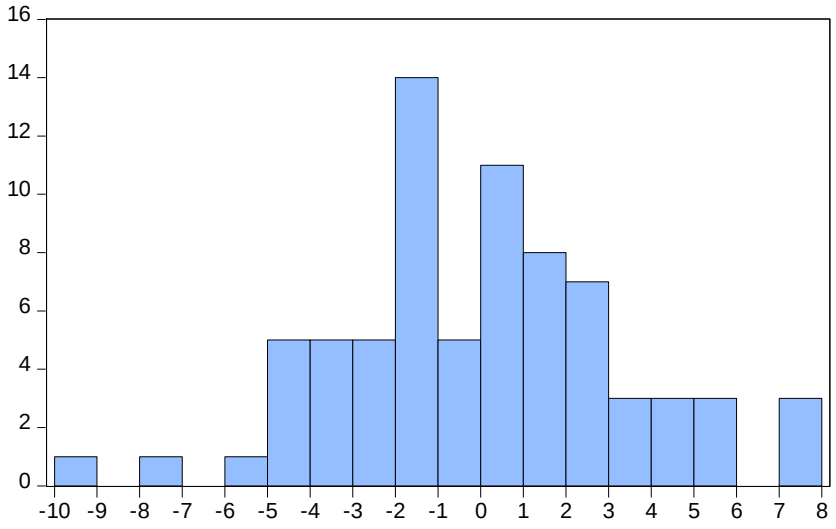
AIB	2013	749.96	12,545.21	7,710.00	28.03	9.90	512.36	13.50	11.88	1
AIB	2014	1,160.87	15,039.71	9,176.36	27.25	10.35	666.92	8.10	11.88	1
AIB	2015	1,928.14	18,520.42	12,482.04	22.98	10.40	828.26	7.70	11.88	1
AIB	2016	2,149.71	22,832.03	15,450.78	21.54	8.00	1,014.20	9.69	12.75	1
DB	2002	61.00	1,191.00	872.00	22.33	1.63	18.00	(10.57)	10.75	0
DB	2003	99.00	1,621.00	1,267.00	21.51	(2.10)	25.00	10.92	10.50	0
DB	2004	107.00	2,178.00	1,690.00	37.21	11.73	39.00	7.35	10.50	0
DB	2005	143.00	2,833.00	2,232.00	34.22	12.64	57.00	6.13	10.50	0
DB	2006	310.00	3,692.00	3,164.00	42.29	11.54	90.00	10.58	10.50	0
DB	2007	657.00	4,861.00	3,988.00	40.19	11.79	137.00	15.82	10.50	0
DB	2008	692.78	6,151.52	4,382.00	37.50	11.19	196.74	25.30	11.50	0
DB	2009	701.95	7,925.21	4,451.51	30.49	10.04	259.21	36.40	12.25	0
DB	2010	698.78	10,144.55	5,048.84	31.89	10.57	340.22	2.80	12.25	0
DB	2011	635.72	11,841.24	9,409.56	35.77	11.40	452.88	18.10	11.88	1
DB	2012	784.04	14,065.60	8,123.81	40.44	8.70	615.88	34.10	11.88	1
DB	2013	1,008.09	15,851.26	8,862.32	31.33	9.90	767.57	13.50	11.88	1
DB	2014	1,172.42	17,681.34	9,429.63	30.69	10.35	945.69	8.10	11.88	1
DB	2015	1,457.59	19,814.11	11,526.99	26.41	10.40	1,127.98	7.70	11.88	1
DB	2016	1,591.86	22,758.50	12,695.12	23.15	8.00	1,309.74	9.69	12.75	1

Bank	Year	TD	TOD	LA	ROE	GDP	RR	INF	ALR	NBEB
BoA	2002	144.00	909.00	669.00	(1.39)	1.63	10.00	(10.57)	10.75	0

BoA	2003	150.00	1,076.00	809.00	4.14	(2.10)	11.00	10.92	10.50	0
BoA	2004	115.00	1,275.00	962.00	22.22	11.73	21.00	7.35	10.50	0
BoA	2005	111.00	1,627.00	1,234.00	27.29	12.64	36.00	6.13	10.50	0
BoA	2006	226.00	2,177.00	1,963.00	25.91	11.54	58.00	10.58	10.50	0
BoA	2007	312.00	2,721.00	2,305.00	16.65	11.79	75.00	15.82	10.50	0
BoA	2008	281.02	3,477.77	2,817.15	3.54	11.19	78.76	25.30	11.50	0
BoA	2009	233.13	4,494.19	2,708.96	21.40	10.04	103.85	36.40	12.25	0
BoA	2010	136.20	5,138.85	3,153.24	25.45	10.57	139.00	2.80	12.25	0
BoA	2011	61.03	6,075.26	3,315.69	29.04	11.40	183.61	18.10	11.88	1
BoA	2012	217.25	6,771.46	3,897.41	27.60	8.70	237.55	34.10	11.88	1
BoA	2013	541.47	8,496.15	4,702.07	21.48	9.90	303.74	13.50	11.88	1
BoA	2014	842.82	9,096.48	5,061.01	33.94	10.35	371.42	8.10	11.88	1
BoA	2015	893.94	11,118.17	5,905.22	17.47	10.40	443.37	7.70	11.88	1
BoA	2016	877.19	13,634.96	8,011.61	18.33	8.00	537.07	9.69	12.75	1
WB	2002	137.00	511.00	406.00	9.84	1.63	6.00	(10.57)	10.75	0
WB	2003	179.00	704.00	571.00	14.01	(2.10)	8.00	10.92	10.50	0
WB	2004	150.00	876.00	738.00	28.83	11.73	16.00	7.35	10.50	0
WB	2005	180.00	1,288.00	1,002.00	31.07	12.64	28.00	6.13	10.50	0
WB	2006	330.00	1,778.00	1,593.00	32.64	11.54	46.00	10.58	10.50	0
WB	2007	710.50	2,723.50	2,155.00	34.04	11.79	74.00	15.82	10.50	0
WB	2008	679.91	2,966.33	2,346.78	27.54	11.19	108.33	25.30	11.50	0
WB	2009	340.20	3,728.38	2,112.38	25.06	10.04	153.48	36.40	12.25	0
WB	2010	192.01	3,922.80	2,473.87	23.66	10.57	209.32	2.80	12.25	0

WB	2011	311.12	5,957.48	2,910.05	27.06	11.40	290.14	18.10	11.88	1
WB	2012	555.60	5,758.18	3,565.67	22.86	8.70	374.05	34.10	11.88	1
WB	2013	573.76	7,550.66	4,690.14	19.99	9.90	459.06	13.50	11.88	1
WB	2014	636.08	8,384.48	4,604.42	15.34	10.35	538.67	8.10	11.88	1
WB	2015	428.70	9,870.94	6,071.92	15.46	10.40	626.78	7.70	11.88	1
WB	2016	588.75	11,078.55	7,506.22	14.39	8.00	720.69	9.69	12.75	1
UB	2002	33.00	189.00	163.00	5.30	1.63	3.00	(10.57)	10.75	0
UB	2003	55.00	287.00	290.00	5.59	(2.10)	4.00	10.92	10.50	0
UB	2004	138.00	532.00	384.00	7.49	11.73	6.00	7.35	10.50	0
UB	2005	277.00	865.00	593.00	28.05	12.64	14.00	6.13	10.50	0
UB	2006	208.00	1,220.00	1,004.00	27.85	11.54	25.00	10.58	10.50	0
UB	2007	307.00	1,541.00	1,410.00	23.23	11.79	41.00	15.82	10.50	0
UB	2008	404.93	2,443.35	1,859.66	22.00	11.19	63.55	25.30	11.50	0
UB	2009	525.09	3,615.75	2,152.23	18.95	10.04	86.95	36.40	12.25	0
UB	2010	365.86	4,724.85	2,613.61	30.14	10.57	130.56	2.80	12.25	0
UB	2011	423.43	6,065.82	3,276.96	30.13	11.40	188.52	18.10	11.88	1
UB	2012	741.38	6,757.51	4,085.38	29.74	8.70	262.98	34.10	11.88	1
UB	2013	668.89	8,063.47	4,710.76	18.56	9.90	333.47	13.50	11.88	1
UB	2014	592.95	8,904.98	5,069.62	14.28	10.35	403.01	8.10	11.88	1
UB	2015	1,890.95	11,804.36	6,860.08	17.25	10.40	473.34	7.70	11.88	1
UB	2016	1,597.54	13,037.64	8,534.36	18.04	8.00	558.10	9.69	12.75	1

Appendix 2: Normality Test Result



Series: Standardized Residuals
Sample 2002 2016
Observations 75

Mean	1.38e-14
Median	0.006388
Maximum	7.369409
Minimum	-9.250573
Std. Dev.	3.255323
Skewness	0.020265
Kurtosis	3.204795
Jarque-Bera	0.136199
Probability	0.934167

Appendix 3: Heteroskedasticity Test: White

F-statistic	1.772907	Prob. F(7,82)	0.1038
Obs*R-squared	11.83060	Prob. Chi-Square(7)	0.1063

Scaled explained SS	23.58340	Prob. Chi-Square(7)	0.0013

Test Equation:
Dependent Variable: RESID^2

Method: Least Squares
Date: 05/23/17 Time: 19:53
Sample: 1 90
Included observations: 90

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	105.1617	76.81601	1.369008	0.1747
GDP^2	0.114240	0.135455	0.843377	0.4015
INF^2	-0.002318	0.016225	-0.142865	0.8867
LRR^2	-0.815404	0.826208	-0.986923	0.3266
LIQ^2	0.001688	0.004051	0.416716	0.6780
ALR^2	-0.614173	0.531462	-1.155628	0.2512
NBEB^2	-0.165981	18.74638	-0.008854	0.9930
ROE^2	-0.007269	0.006948	-1.046283	0.2985

R-squared	0.131451	Mean dependent var	26.32121
Adjusted R-squared	0.057307	S.D. dependent var	58.00635
S.E. of regression	56.31975	Akaike info criterion	10.98466
Sum squared resid	260097.0	Schwarz criterion	11.20686
Log likelihood	-486.3095	Hannan-Quinn criter.	11.07426
F-statistic	1.772907	Durbin-Watson stat	1.586682
Prob(F-statistic)	0.103847		

Appendix 4: Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.511721	Prob. F(5,74)	0.7666
Obs*R-squared	2.974399	Prob. Chi-Square(5)	0.7039

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 05/23/17 Time: 19:46
Sample: 2 90
Included observations: 89
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.241288	9.492931	0.025418	0.9798
GDP	-0.015110	0.113698	-0.132893	0.8946
INF	0.004034	0.038252	0.105458	0.9163
LRR	-0.035007	0.381357	-0.091795	0.9271
LIQ	-0.015164	0.042383	-0.357776	0.7215
ALR	0.029104	0.766566	0.037966	0.9698
NBEB	0.162534	1.167560	0.139208	0.8897
ROE	-0.000161	0.034973	-0.004592	0.9963
RESID(-1)	-0.008355	0.171442	-0.048731	0.9613
RESID(-2)	-0.206734	0.147069	-1.405689	0.1640
RESID(-3)	0.032522	0.135789	0.239500	0.8114
RESID(-4)	-0.097534	0.126964	-0.768199	0.4448
RESID(-5)	0.026786	0.124355	0.215395	0.8301

R-squared	0.033420	Mean dependent var	-2.82E-15
Adjusted R-squared	-0.149446	S.D. dependent var	3.295106
S.E. of regression	3.532757	Akaike info criterion	5.514542
Sum squared resid	923.5474	Schwarz criterion	5.933975
Log likelihood	-230.3971	Hannan-Quinn criter.	5.683603
F-statistic	0.182758	Durbin-Watson stat	1.982944
Prob(F-statistic)	0.999480		