ST. MARY'S UNIVERSITY

SCHOOL OF GRADUATE STUDIES

FACTORS AFFECTING DEPOSIT MOBILIZATION IN ETHIOPIAN PRIVATE COMMERCIAL BANKS

BY

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(SGS/0409/2007A)

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DECLARATION

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

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Menbere Getachew Selewondim **SIGNATURE**

St. Mary's University, Addis Ababa **JANUARY 2018**

ENDORSMENT

This thesis has been submitted to St. Mary's University, School of Graduate Studies for examination with my approval as a University advisor.

Asmamaw Getie (Assistant Prof.)	**SIGNATURE**
St. Mary's University, Addis Ababa	**JANUARY 2018**

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ACRONYMS

HP:	Hypotheses
CLRM:	Classical Liner Regression Model
EVIEWS8:	Econometric Views Software Version 8
ETB:	Ethiopian Birr
GDP:	Gross Domestic Product
IMF:	International Monetary Fund
INF:	Inflation Rate
LIQ:	Liquidity
DEP:	Deposit
NUMBRA:	Number of Bank Branches
IR:	Interest Rate
NBE:	National Bank of Ethiopia
CBE:	Commercial Bank of Ethiopia
AIB:	Awash International Bank
DB:	Dashen Bank
BOA:	Bank of Abyssinia
WB:	Wegagen Bank
UB:	United Bank
NIB:	NIB International Bank
CBO:	Cooperative Bank of Oromia
LIB:	Lion International Bank
OIB:	Oromia International Bank
BUIB:	Bunna International Bank
ZB:	Zemen Bank
AB:	Abay Bank
BIB:	Berhan International Bank
ATMs:	Automated Teller Machines

ABSTRACT

The study sought to find out the factors that affect deposit mobilization of selected private commercial banks in Ethiopia. In order to fulfill the stated objective an explanatory research design with quantitative approach was used. Five explanatory variables were taken; those are number of branches, inflation, GDP, liquidity and deposit interest rate. The secondary data were collected from audited annual reports of selected private commercial banks and data from National Bank of Ethiopia. Balanced panel regression model was used for data covered from 2011/12-2015/16. Hetroscedasticity, auto-correlation, multi-collinearity and normality tests were performed to test whether the variables satisfy the assumptions of the research. The regression results showed that three variables, number of branches, inflation and liquidity had statistically significant effect on deposit mobilization. Among these variables that affect deposit mobilization, number of branches, inflation and interest rate had positive effect whereas, GDP and liquidity had negative effect on deposit mobilization. Hence, based on the findings of the study the researcher suggests that management of private commercial banks should give an adequate emphasis to deposit mobilization through expanding their branches by introducing a segmented customer targeting business model, coming up with new, innovative and low cost services, giving more attention to small business and low income groups and broadening its customer base by focusing on the unbanked population in order to increase their deposit.

Key Words: Deposit mobilization, Private Commercial Banks

CHAPTER ONE

INTRODUCTION

1.1. Background of the Study

Banks play a vital role in the livelihood of society by facilitating financial services for the economic development of a country in general. According to Bello (2005), banking system is the backbone of financial intermediation through the mobilization and channeling of financial resources. Banks in performing their pivotal role in the economy, facilitate financial settlement through the payment system, influence money market rates and provide a means for international payment. The sector mobilizes funds from the surplus-spending units into the economy and by lending such funds to the deficit spending units for investment, banks in the process increase the quantum of national savings and investment (Mordi, 2004). The financial services include deposits, withdrawals, loans, guarantees, transfers, import and export, letter of credits (LCs) and the like. There are three main fund sources that banks use, namely capital mobilization, deposit mobilization and NBE's short term loans grants, of the three fund sources; deposit mobilization holds the lion's share in serving as the source for loan grants and day-to-day working capital. Banks mobilize deposits from individual households, business entities, religious organs, Idirs etc., and utilize these deposits in granting various term loans and overdrafts to various customers in such a way that maximizes the banks' profits. This study is about the challenges faced by selected Banks in the process of deposit mobilization.

According to Kazi (2012), in banking sector, deposit mobilization is a scheme intended to encourage customers to deposit more cash with the bank and this money in turn will be used by the bank to disburse more loans and generate additional revenue for them. The main business for banks is accepting deposits and granting loans. The more the loans the banks disburse the more profit they make. Also, banks do not have a lot of their own money to give as loans. They depend on customer deposits to generate funds for granting loans to other customers. Deposit mobilization is the crucial part of banking activity. Mobilizing of deposits is the primary function of commercial banks. The success of the banking greatly lies on the deposit mobilization performance of the bank as the deposits are normally considered as a cost effective source of

working fund. Deposit mobilization is an essential factor to increase the sources of the banks to serve effectively. Banks provide various deposit schemes such as current, savings, fixed, recurring and other special schemes with different maturity pattern carrying different rates of interests to meet the varying requirement of their customers. The banks should introduce various deposits schemes to attract the public to deposit. It is the size of the deposits that largely decides the lending potential of a bank (Rajeshwari, 2014).

Currently in Ethiopia, in addition to the central bank, there are 2 state owned and 16 private banks (which include the commercial banks and specialized banks). Financial sector policy in Ethiopia does restrict investment in the sector only to domestic investors. It is believed that domestic banks are too young to cope with the competition that would have come from highly experienced and sophisticated foreign banks and allowing foreign banks participation may result in loss of control over the economy. Ethiopia has no capital market and very limited informal investing in shares of private companies.

In Ethiopia commercial banks are the main controller of the financial system performing financial intermediation. They control greater portion of the investment funds from domestic deposits and are the main creditors of the corporate bodies, SMEs and individual investors. Most of the banks functioning in Ethiopia use deposits as an input for loan disbursement and allied activities. Therefore, mobilizing significant amount of savings and channeling it to productive investment through domestic credit is one of their major functions.

1.2. Statement of the Problem

Deposit mobilization is the most important function of commercial banks since their successful functioning depends on the extent of funds mobilized. Mobilizing deposit is the major activity of all commercial banks, managing and identifying the determining factors of deposit is a mandatory task for banks. For the purpose of achieving self-sufficient deposit mobilization, there is the need to improve ways of mobilizing domestic deposits, therefore banks should take mobilization as fundamental objective and put it at the core of their operational planning. Records indicate that there are large chunks of deposits lying idle under pillows in the rural areas being left out of the banking stream (Rutherford, 2000). Therefore, commercial banks should

increase ways to approach and mobilize the huge deposits lying in the unbanked people to maximize and maintain their portfolios.

Traditionally, customers of banks walk to the banking premises to deposit money. This method of savings mobilization is not able to mop up enough savings. The World Development Report, (2008), in response to the problem of inability to mobilize enough savings, many banks has devised mechanisms of generating savings. Among the mechanisms for savings mobilization identified by bank's include moving from shop to shop to collect daily deposits, sending agents to economic zones to mobilize savings, among others.

According to NBE (2015/16), the total number of commercial banks branches has reached to 3,187 and from this 34.4 percent of the branches were found in Addis Ababa**.** This implies that banks' branch network more concentrated on urban area. The competition between Ethiopian banks as well is unhealthy as they all chase same market (groups) focusing on few large reputable depositors who have the ability to save. These shows that the deposit mobilization practice among commercial banks in Ethiopia is not developed as it should be.

Stated owned bank CBE handling exclusively the 40/60 and 20/80 housing scheme and the unanticipated actions that led run on banks to the industry by siphoning-off funds away from other banks, has brought struck devastating blow to the private banks in terms of mobilizing deposit. In line with a rise in branch network, deposit mobilized by banks reached at 440 billion Birr in 2015/16 operational period. The share of private banks in deposit mobilization showed 33.6pc in the 2015/16 fiscal year. CBE alone mobilized 66pc of the total deposits banking system.

Thus the main purpose of this study is determining the factors influencing deposit mobilization of Ethiopian private commercial banks. And also as the research conducted in this particular area is rarely available academicians lacks the reference material of this area. The researcher motivated to undertake a research in this particular area to fill these gaps.

1.3. Objectives of the study

1.3.1 General objective

The general objective of this study is to identify the factors influencing deposit mobilization of private Ethiopian commercial banks.

1.3.2 Specific objectives

The specific objectives of this research are:-

1. To determine the relationship and effect of inflation, interest rate and economic growth (GDP) on deposit mobilization.
2. To determine the relationship between private commercial banks deposit mobilization and liquidity and branch expansion.

1.4. Hypothesis

In order to achieve the objective of the study, the following hypotheses were tested regarding to variables that affect deposit mobilization of Ethiopian private commercial banks.

H1: Liquidity of commercial banks positively affects deposits mobilization

H2: Branch expansion positively affects deposits mobilization of commercial banks

H3: Deposit Interest rate positively affects deposit mobilization of commercial banks

H4: Inflation rate inversely affects deposits mobilization of commercial banks

H5: Economic growth positively affects deposits mobilization of commercial banks

1.5. Scope of the Study

The study essentially focuses on determining the factors influencing deposit mobilization of selected Ethiopian private commercial banks which are Awash Bank, Dashen Bank, Bank of Abyssinia, Wegagen Bank, United Bank, Nib International Bank, Cooperative Bank of Oromia, Lion International Bank, Oromia International Bank, Bunna International Bank, Abay Bank and Berhan International bank by evaluating the effect of inflation, economic growth, deposit interest rate, liquidity and number of branches variables by taking into consideration the past five years trend from 2011/12 to 2015/16.

1.6. Limitation of the study

The regression have one dependent variable total deposit of commercial banks and five independent variables including deposit rate, inflation rate, number of branches, GDP and liquidity. However, other factors that affect deposit mobilization were not included in the study due to lack of operating budget and organized data. However, necessary effort has been made so as to achieve the objectives of the study.

1.7. Significance of the Study

Deposit is an important source of working fund for the bank. This study will give the insight and contribution to the banks managers and policy makers to weigh the factors that influence their own deposit mobilization and to develop the strategies that will help mobilize more deposit from the customers.

The study would have great a contribution to the existing knowledge in the area of factors influencing commercial banks' deposit mobilization in the context of Ethiopia. The findings from this study could serve for further study in the sector and will help as additional input for concerned policy makers and future researchers, who will have an interest on the factors that influence the deposit mobilization. And also used as a reference for commercial banks to focus and control over the variables that bring negative effects to deposit mobilization.

1.8. Organization of the study

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

CHAPTER TWO

LITERATURE REVIEW

Both theoretical as well as empirical reviews are discussed in this chapter. The researcher of this paper has reviewed literatures relating to factors influencing deposit mobilization of commercial banks. This chapter discusses deposit mobilization affecting factors identified by the researcher and other factors that affect the mobilization process pointed out by other researchers.

2.1. The Role of Financial Sector for Economic Development

Financial sector mainly constitutes financial markets and financial institutions. A financial market is a market in which financial assets (securities) such as stocks and bonds can be purchased or sold. Financial markets, thus, facilitate the flow of funds and thereby allow financing and investing by households, firms and government agencies (Madura, 2011). Financial institutions include such entitles as insurance corporations, pension funds, brokers, public exchange and securities markets etc). However, in the context of African continent the banking industry carries the lion's share of the financial system (Sheku, 2005). Financial institutions provide service as intermediaries of financial markets. A well-functioning financial institution will sustain a country's economic development and play a great role in the reduction of poverty. They play an important role in the economy because they provide liquidity services, promote risk sharing and also solve information problems thereby allowing small savers and borrowers to benefit from the existence of financial markets.

Financial institutions can be divided into:

Depository institutions (e.g. commercial banks, savings institutions, credit unions) that obtain funds mainly through deposits from the public; and Non-depository institutions (e.g. finance companies, mutual funds, securities firms, insurance companies, pension funds) that finance their investment activities from the sale of securities or insurances.

One of the major participants in the financial institution is the banking industry. Banks serve as backbone to the financial sector, which facilitates the proper utilization of financial resources of a country (Dang, 2011).In the context of the African continent the banking industry carries the

greater share of the financial system(Sheku, 2005). Most of the business relies on banking sector as a source of financing (Medhat, 2004). Banks have historically been viewed as playing a role in financial markets for two reasons. One is that they perform a critical role in facilitating payments. Commercial banks, as well as other intermediaries, provide services in screening and monitoring borrowers; and by developing expertise and also diversifying across many borrowers, banks reduce the costs of supplying credit (Katherine, 2004). The relative importance of the different roles of banks varies substantially across countries and times but banks are always critical to the financial system.

Moreover commercial banks will affect the overall economy of the specific country both in a good way or a bad way. Commercial banks represent a vital link in the transmission of government economic policies (particularly monetary policy) to the rest of the economy. As Kelvin (2001) explains, when banks credit is scarce and expensive, spending in the economy tends to slow and unemployment usually follows. So the event in the commercial banks will affect the country's economy in general.

Bank deposits represent the most significant component of the money supply used by the public, and changes in money growth are highly correlated with changes in the prices of goods and services in the economy (Kelvin, 2001). Commercial banks are critical to the development process. By granting loans in areas such as agriculture, manufacturing, services, construction and energy sectors, banks contribute to the development of the country.

Not only commercial banks are affecting the economy but also the economy affects the functions of commercial banks. Bank loan portfolio including volume, tenor and structure may be generally influenced by their expectations of the performance of the economy both in terms of stability and level of performance. As cited by Talavera et al. (2006), Russell et al (2009) banks make out more loans during periods of boom and reduced level of macroeconomic uncertainty and curtail lending when the economy is in recession.

2.2. Bank Deposit

Deposit is money kept at a bank, microfinance institution, the public institutions, organizations, and co-op. Among the variety of traditional deposits, saving deposit is one of the basic components for credit operation. Bank deposits represent the most significant component of the

money supply used by the public, and changes in money growth are highly correlated with changes in the prices of goods and services in the economy (Kelvin, 2001).

Bank deposit is an amount of money held at a financial institution on behalf of an account holder for safekeeping, Most bank deposits are insured by organizations to reduce their risk. Bank deposits are made to deposit accounts at a banking institution, such as savings accounts, current or demand deposits, and fixed or time deposits/term deposits. The depositor has the right to withdraw any deposited funds, as set forth in the terms and conditions of the account. The deposit itself is a liability owed by the bank to the depositor (the person or entity that made the deposit), and refers to this as liability rather than to the actual funds that are deposited (Adam, 2005).

The following are most common type of bank deposit:

Demand/Current Deposit:

A current account is the type of account which operators have access to their money at all times Demand deposits can be "demanded" by an account holder at any time. It enables customers (enterprises, societies, individuals and corporate bodies) to transact business and pay for them later. Many checking accounts today are demand deposits and are accessible by the account holder through a variety of banking options, including teller, ATM and online banking.

Savings Account:

Saving account is a deposit account held at a bank or other financial institution that provides principal security and a modest interest rate. Savings accounts enable customers to deposit their money for investment and/or future use. Depending on the specific type of savings account, the account holder may not be able to write checks from the account (without incurring extra fees or expenses) and the account is likely to have a limited number of free transfers/transactions. Savings accounts are available to all customers, personal individuals, groups, corporate bodies and societies.

Time Deposit:

Time deposit or certificate of deposit (CD) held for a fixed-term, with the understanding that the depositor can make a withdrawal only by giving notice. A time deposit is an interest-bearing bank deposit that has a specified date of maturity.

2.3. Deposit Mobilization

Deposit mobilization means campaigning and collecting customer deposits. The banks would have special campaigns where they would interact with a lot of people and invite them to make deposits with their bank. Mobilizing savings involves overcoming the transaction costs associated with collecting savings from different individuals and the informational asymmetries associated with making savers feel comfortable in relinquishing control of their savings (Maimbo, 2003). Deposit mobilization has various roles on financial system; it can accumulate capital, improve resources allocation and boost technological innovation (Sirri and Tufano, 1995).

2.4. Significance of Deposit for Banks

For a commercial bank, deposits are (apart from equity capital) the oldest, most stable and, by volume, most significant source of funding. In the traditional model of the bank as an intermediary between savers and borrowers, deposits are the counterparts of the loans (Sophie and Jan 2012).

Deposits play an important role in the banking system, whether cooperative or commercial. Deposits provide limits to the working capital of the bank concerned. The higher the deposits, the higher will be the funds at the disposal of a bank to lend and earn profits(N. Desinga, 1975). Therefore to maximize its profit the bank should increase its deposit. Mahendra(2005) had also mentioned deposits as a foundations upon which banks thrive and grow and unique items on a bank's balance sheet that distinguish them from other type of business organizations. Deposits are not only a crucial funding instrument for banks, but also one of the most important forms of investment for private individuals (Sophie and Jan, 2012).

Mobilization of deposits for a bank is as essential as oxygen for human beings. As a result, mobilization of savings is one of the important objectives of the commercial banks and

instruments to expand banking operations, by providing subsidy for branch expansion. The successful functioning of commercial banks depends on the extent of funds mobilized.

2.5. Factors Affecting Deposit Mobilization

Economist John Kenneth Galbraith (1975) noted that money is equally important to those who have it and those who do not. People in rural and other low-income communities can save when they are guided and encouraged.

Although banks and insurance companies help people to manage their money they argue that it is impossible for banks to make a reasonable profit by dealing in low sums of money. In many rich countries, in recent years, banks are closing branches in and around poor communities, and in many developing countries; banks simply do not consider mobilizing savings from the poor at all. Different factors affect the growth of commercial banks deposit in any country. The volume of bank deposit is mostly determined by the interaction of the supply of and the demand for the money. The supply of deposits in the banking system is generally determined by the components of reserve money. The demand for bank deposits is determined by income, rate of interest, and service variables (i.e.; network of bank branches' or per capita bank branches as well as the improvements in banking services). Besides, structural factors like monetization, financial innovation, literacy rate also affect the demand for bank deposits (Tareq, 2015). These are macroeconomic factors and bank specific factors that can affect the growth of commercial banks deposits. These are discussed as follows:-

2.5.1. Macroeconomic Factors

I. Inflation

Inflation is defined as the persistent increase in the general prices of goods and services within an economy over a given period of time (Beligna, 2012). As Deaton (1991) explained inflation is measured alternatively by Consumer price index. He used three theories to explain how inflation may influence savings.

- The first theory assumed that greater uncertainty should raise savings since risk-averse consumers set resources aside as a precaution against possible adverse changes in income and other factors. Inflation may increase precautionary savings by individuals.

Precautionary saving is additional saving that result from the knowledge that the future is uncertain (Carroll & Kimball, 2006).

- The second theory was that, inflation could influence saving through its impact on real wealth. If consumers attempt to maintain target level of wealth or liquid assets relative to income, saving will rise with inflation.
- The last theory was that, saving may rise in inflationary period if consumers mistake an increase in the general price level for an increase in some relative prices and refrain from buying (Deaton, 1991). Santoni (1985) also defined inflation as Deaton did. Besides, he classified inflation in to two; anticipated inflation and unanticipated inflations.

The rate of inflation and the inflationary expectations might have some influence on the growth of overall deposits with the banking system. It is generally assumed that the growth of total deposits is to be negatively related with inflationary expectation. As the rate of inflation increases, people will be tempted to divert their savings from bank deposits to any other kind of tangible assets because these assets act as hedge against inflation (Tareq 2015).

As inflation accelerates, deposits become less attractive, depending on the interest rate. In this case, the assumption would be that as deposit interest rates rise, deposits would increase in principle as well. The narrower the spread between deposit rates and inflation, the less attractive it should be to hold deposits above the required level (Sophie and Jan 2012).

II. Interest Rate (Deposit rate)

One of the most effective factors for deciding to deposit in banking system is the interest rate (Mohammad and Mahdi, 2010). The sensitivity of deposits to the rate of interest mainly depends on the portfolio preference of the depositors. In this context, the ownership patterns of the various types of deposits have a significant leverage. The elasticity of response to interest rate varies from one form of interest to another.

Interest rate in the banking system is held as investment cost from the investor's point of view and opportunity cost from the depositor's point of view (Mohammad and Mahdi, 2010). Thus, capital market forces balance interest rates. In other words, the just and correct interest rate should be determined through market mechanism, that is, interest rate is balanced in supply and demand conditions in proportion with the inflation rate. Eustacius and David (1995) states that

deposits are more interest rate sensitive and banks may choose to increase investments in interest rate sensitive assets and to decrease investments in loans. That is commercial bank deposits are interest rate sensitive, therefore as the interest rate changes the deposit of the commercial banks will change.

Economists, mainly conventional ones, believe that depositors are attracted to deposit their money in banks because of the opportunity cost of holding cash in hand is high when the interest rate is also high (Roomer, 2001, Athukorala and Sen., 2004). This can easily be explained by the utility maximization (cost minimization) premise, as a depositor will choose an action that will maximize their welfare or satisfaction. As to Richard (1971), regulation of the commercial banking industry affects the returns which commercial banks realize on their deposits and capital. That is although deposits are the source for profit of banks it is influenced by the regulation of the country.

Accordingly, the higher profit rate on demand deposits is to a large extent the result of the prohibition against the payment of interest on these deposits. Therefore, depositors are motivated by returns. Using an Adaptive Expectation Model (AEM), it is founded that depositors are indeed motivated by returns in Malaysia (Erna and Ekki, 2004). On the other hand, Erna and Ekki (2004) state that Ghafur's (2003) shows that the rate of interest does not have influence on the volume of the deposits. However, Rose (2001) said that banks increase their deposits by offering higher deposit interest rate. These are the articles that contradict to each other in identifying the relationship between the commercial banks deposits and saving interest rates or deposit rate.

III. Gross Domestic Product (GDP)

Economic performance is generally being measured through GDP (Gross Domestic Product), a variable that has also become the de facto universal metric for 'standards of living (Yanne et al, 2007). It is universally applied according to common standards, and has some undeniable benefits mainly due to its simplicity (Goossens et al, 2010). According to Finger and Hesse(2009), growth is one of the determining factors for commercial banks deposits. GDP is calculated by adding up the value- added at each stage of production (deducting the cost of produced inputs and materials purchased from an industry's suppliers) (Jim, 2008).

If there is a real growth in the economy, the deposit will grow as well. This hypothesis was proved by the chakra arty committee in 1985. The committee reported that the growth rate of deposit in India at an accelerated pace was attributed to the higher real growth achieved by the economy (chakra arty committee in, 1985). And also according to Jim (2008), the level of GDP divided by the population of a country or region is known as per capita income. Changes in real GDP per capita over time are often interpreted as a measure of changes in the average standard of living of a country. Thus the relation between income of the society and deposit volume is expected to be positive and significant.

Alemayehu (2015), in his article published on MudayeNeway Magazine, states that many African studies show high degree of association between growth of an economy and saving. However, the causality issue (whether saving causes growth or the other way round) is not yet settled. He stated that most studies seem to suggest that economic growth influence saving. And economic growth is found to be the most important variable that has a significant positive effect on saving (Mudayeneway, 2015).

IV. Exchange Rate

Exchange rates are quoted as foreign currency per unit of domestic currency or domestic currency per unit of foreign currency (Bishop, 2006). Exchange rate allows denominating the cost or price of a good or service in a common currency. As Thomas's explanation, the term depreciation and appreciation is used to show the decrease and increase in the value of currency. Depreciation is a decrease in the value of currency relative to another currency. Appreciation is an increase in the value of a currency relative to another currency. As Economic Help online explained, the main factors that influence exchange rate are: inflation, interest rate, speculation, and change in competitiveness, balance of payment, government debt, government intervention and Economic growth /recession. According to Nugel (2012) as currencies depreciated in one country deposit will be reduced since investors tend to withdraw deposit and exchanged to keep it by appreciating currency (Hard currency) or invest in another form of investment rather than bank deposit. Alemayehu (2015) also confirms that for developing country in general saving is negatively correlated with unstable exchange rate.

2.5.2. Bank Specific Factors

I. Liquidity

Liquidity can be defined as the ability of a financial institution to meet all legitimate demands for funds (Yeager and Seitz 1989). It is also defined as the ability of bank to fund increases in assets and meet obligations as they come due, without incurring unacceptable losses (Bank for International Settlement 2008). Liquidity allows banks to meet depositors' and creditors' demand and so to maintain public confidence. (Finger & Hesso, 2008), states that the liquidity situation of the bank also plays a significant role in determining banks deposit growth.

Key liquidity indicators such as central bank credit to financial institutions, deposits as a share of monetary aggregates, loans to deposits ratios, are important for open market operations and liquidity management (Sheku, 2005). The basic need for liquidity, asset, liability, capital adequacy, credit and interest rates risks management are now more challenging than before. The banks' liquidity management involves acquiring sufficient liquid asset to meet the bank's obligation to depositors. According to the theories of financial intermediation, the two most crucial reasons for the existence of financial institutions, especially banks, are their provision of liquidity and financial services (ISMAL, 2010). According to (ISMAL, 2010), Regarding the provision of liquidity, banks accept funds from depositors and extend such funds to the real sector while providing liquidity for any withdrawal of deposits, however the banks' role in transforming short term deposits into long term loans makes them inherently vulnerable to liquidity risk(Bank for International Settlements, 2008b:1). Individuals, businesses and governments will be willing to deposit their money in banks if they are certain that they are safe to withdraw the money whenever they want, this is the question of liquidity of banks. The more liquid banks can attract the deposits.

II. Profitability of the bank

Higher bank profits would tend to signal increased bank soundness, which could make it easier for these banks to attract deposits (Herald 2009).Erna and Ekki(2004) find that there is a long run relationship between commercial banks deposits and the profitability of the banks.

III. Security of the bank

One of the reasons as to why people deposit in banks is to ensure a feeling of security for their money. The security of banks has its own impact on its attractiveness to depositors. 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 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.

IV.Branch Expansion

The availability of banking services in a country can be measured by the total number of bank branches. The idea is that the growth of deposits will be larger if there are more bank branches in the country. Conveniently located bank branches can reduce transaction costs significantly and thereby increase the net return earned on deposits (Tarique, 2015). Banks and financial resources attract more customers to the appropriate workplace environment that includes indicators of physical, psychological and social welfare as well. It is expected that banks make decisions on expanding their facilities by considering factors such as level of competition, deposit potential, regional income and existence of road and vehicles. Branching enables banks to diversify their loans and deposits over a wider geographical area or customer base (Mark & Kris, 2006).

V. Bank size

Among the factors prominently identified as affecting deposit variability one is bank size. Evidence indicates that the number and diversity of the ownership of individual deposit accounts as well as the distribution of deposits by type vary with bank size (Kaufman, 1972). (Finger & Hesse, 2008), founds that although insignificant once controlled by other variables bank size has an effect on deposits. Smaller banks have to generate fewer deposits in absolute terms to achieve the same deposit growth than large banks, thus possibly favoring smaller banks in achieving higher deposit growth. But a larger bank with economies of scale as well as larger branch network might be able to better attract deposits (Finger & Hesse, 2008).

VI.Reserves

Richard Goode and Richard S. Thom (1959) said that reserves that are fixed legally can influence the deposits that banks can hold. According to them 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. Therefore, 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. The commercial banks can obtain currency to pay out to customers only by drawing down their reserve deposits at the central bank or by using till money. Till money, according to Richard Goode and Richard S.Thom(1959) is the currency that banks keep on hand to satisfy day to day needs. They pointed out that bank deposits are a large part of the money supply in all countries.

VII. Technologies

Technology has become an intrinsic part of banking, making it easier and cheaper to develop and deliver financial services. As a consequence of the highly technological environment developed around the world in the banking industry, the expansion of distribution channels for financial services relies on a very complex network of partnerships (Weissbourd, 2002).

At the same time, in developing countries, only part of the population has access to basic financial services, such as a deposit account, for example. A number of studies (Claessens 2006; UNDP 2007) have claimed that technology will play a significant role in improving poor people's bank access, taking financial services in a sustainable way too far and underserved locations. There is a tremendous opportunity for banking technology to connect lower-income citizens at reduced costs and bring millions of consumers to the formal financial market place through electronic channels (Weissbourd, 2002). With the incorporation of innovation and technology, many aspects of banking have been automated and improved.

Financial technologies such as card banking enable customers' access to cash services 7-days-24 hours by making large cash carrying unnecessary (Gunnar & Zhao, 2013). It shifts out the

traditional frontier of access to banks. Deposit per capital of countries had grown well after the introduction of card payment, ATM and mobile/internet banking technologies in their financial system.

2.6. Review of Empirical Studies

The empirical literature part discusses past studies that were conducted on the area of factors determining commercial banks deposits.

From the findings of the research work (Wubitu, 2012) on Factors determining commercial bank deposit on Commercial Bank of Ethiopia, it is learnt that branch expansion, inflation rate and deposit rate have significant effects on the total deposits of Commercial Bank of Ethiopia for the years under review covering 12 years from 2000GC to 2011GC. Whether these factors identified for the state bank i.e. Commercial Bank of Ethiopia are the only factors for the private banks here in Ethiopia is the aim to be found out in this work.

The article written in 2015 by (Viswanadham et al.) which investigated on the effect of local information technology on banks deposit mobilization status in Ethiopia empirical evidence on private commercial banks in Adama town. In this study, the effect of employees work experience, location and ICT service on the bank deposit mobilization status (increase in bank deposit) particularly in private commercial banks in Ethiopia has been examined. Descriptive and econometrics (binary logit regression model) were employed for data analysis. The result of binary logit regression model revealed that employees work experience is less likely to affect the deposit mobilization status of the bank. While introduction of ICT service has been more likely improves the deposit mobilization (increase in bank deposit) in private commercial banks in Ethiopia.

(Mansour Mshauri, 2012), had written a working paper on assessment of the factors that influence deposit mobilization in Tanzania. The study particularly assessed the importance, applicability and to identify the most effective and applied factors that influence deposit mobilization. The findings indicated that internet banking facilities, banks technology, location of the bank, varieties of the service rendered, interest rate, ATM charges, employee's competence, quality of the service rendered, and marketing strategies of the bank are important

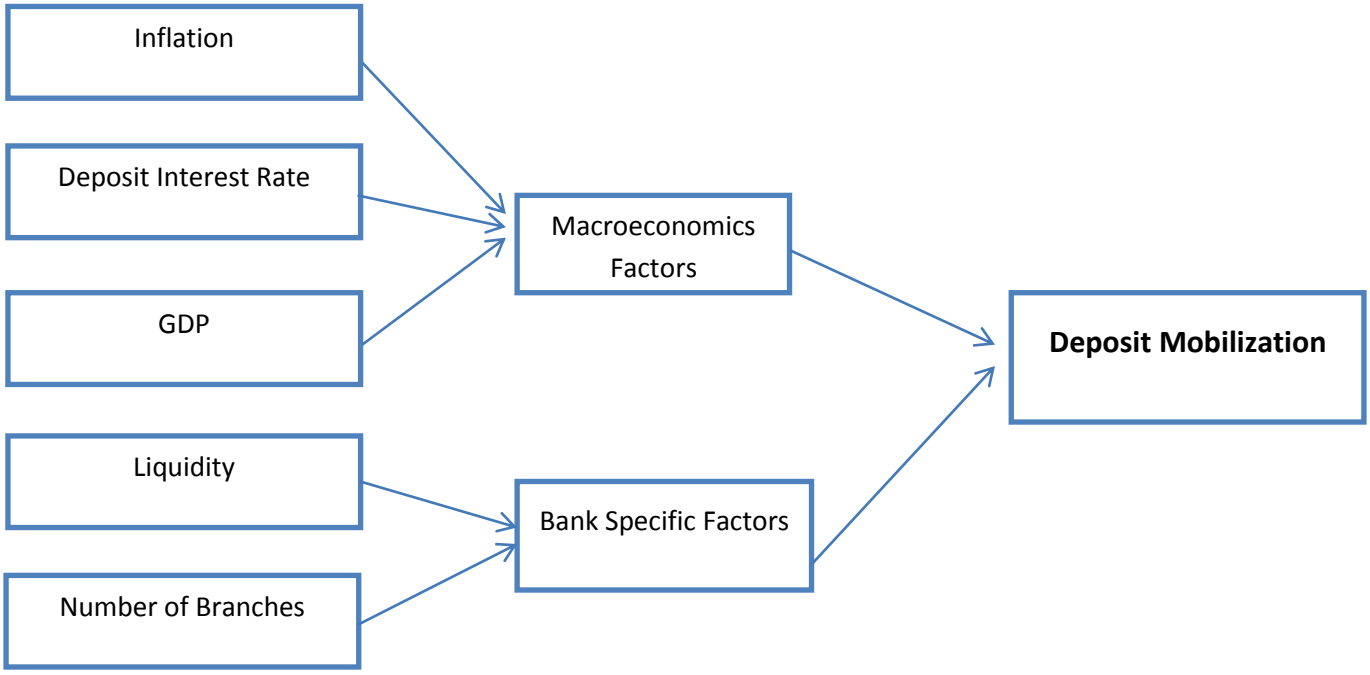
factors and have been applied into the banks to mobilize deposit. Location of the banks, level of bank charges, and quality of services rendered and market strategies of the banks found to be most important factors influence deposit mobilization, while level of bank charges, location of the bank/branch, and market strategies of the bank found to be most applied factors to the banks so as to influence deposit mobilization.

The article written by Tuyishime, Memba & Mbera (2015) was about to establish the effects of deposit mobilization on the bank financial performance in commercial banks in Rwanda. Specific objectives of this study were to determine the effect of marketing strategies on the financial performance of commercial banks in Rwanda, to establish the effect of interest rate changes on the financial performance of commercial banks in Rwanda and to determine the effect of banking technology introduced on the financial performance of commercial banks in Rwanda. The main source of data was the primary and secondary data. The findings indicated that marketing strategy used made the bank to increase in terms of customers and it has led to the increase in deposits over the years. And also a positive change in deposits interest rate affects the level of deposits received and later on the profitability of the bank. The study revealed that the introduction of innovative banking technology has led to the increase in deposits at a low cost as opposed to the usual way of getting deposits through term deposits and made financial services accessible in the unbanked people. This also made the ROA, ROE, net profit increas due as the loans volume increases. The statistical correlation revealed that there is a positive relationship between deposits mobilization and financial performance of commercial banks in Rwanda, the case of Equity Bank. The study recommends the bank to develop other strategies towards marketing and mobilize more deposits as they are indispensable tools towards the profitability of the bank.

2.7. Conceptual Framework

The conceptual schema of the relationship between the dependent variable (private commercial bank of Ethiopia's deposit) and independent (Inflation, Deposit interest rate, GDP, Liquidity and number of branches) variables are depicted here below:

Figure 2.1 Conceptual framework of the study



Source: Developed by the researcher

2.8. Summary and Knowledge gap

Financial institutions have contributed significantly to the effectiveness of the entire financial system as they offer an efficient institutional mechanism through which resources can be mobilized and directed from less essential uses to more productive investments (Wilner, 2000). Among these financial institutions commercial banks are primarily engaged in the business of providing various services to individuals and other organizations. Broadly, the two main activities of commercial banks are to accept funds through mobilized deposits and to grant loans. Accordingly, mobilizing fund is a crucial act of commercial banks widely. Hence, there are many factors such as macro-economics and bank specifics that affect these activities of commercial banks. To the researcher's knowledge, there was a literature gap in terms of taking

recent years data with all Ethiopian private commercial banks to analyze factors affecting deposit mobilization. Therefore, this research meant to fill the gap by focusing on thirteen selected private commercial banks from the period of 2011/12 up to 2015/16. This considered the stress of most private banks by the directives from the central bank enforcing them to invest 27pc each of their loan disbursement on bond. Furthermore, large governmental projects like 40/60 and 20/80 housing scheme were linked only with the public Commercial Bank of Ethiopia (CBE).

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

The previous chapter presented literatures on the role of banking in economic growth, and also briefly described the importance of deposit, the types of deposit and factors influencing deposit mobilization of commercial Banks. This chapter of the research deals with the analytical framework of data analysis which describes the variables included in the study and the methodology and techniques that will be employed in investigating their effect and relationship to deposit mobilization process.

3.1. Research Design

The research design sets the conceptual structure within which a study is conducted. It constitutes the blue print for collection, measuring, presentation and analysis of data collected. According to Solomon (2011) research design helps the researcher organize his ideas in a form whereby it will be possible for him to look for flaws and inadequacies.

The main objective of the study was to examine the factors that affect deposit mobilization of commercial banks in Ethiopia by assessing important variables between two or more points at a time. This can be accomplished by collecting data from more than one point in time and study the relationships between dependent & independent variables (Saundra et al., 2007). Thus, the design that best fits this study was found to be an explanatory design and was used by the researcher.

3.2. Research Approach

This study used the quantitative research approach to achieve its objectives. Quantitative research involves a considerable amount of activities towards measuring concepts with scales that either directly or indirectly provides numeric values which can then be used in statistical computations and hypothesis testing (Zikmund et al 2011).

3.3. Data source

The study was conducted based on secondary data. The paper used a dataset that was assembled from various sources. Consistent and reliable research indicates that research conducted by using appropriate data collection instruments increases the credibility and value of research findings (Koul 2006). When using secondary data sources the study must lookout mainly for the quality and reliability of the data. Therefore, the sources used in the study were audited annual financial reports of the selected private commercial banks and different reports of NBE within the time period of the study to examine the relationship between the dependent and independent variables. And also the Internet and professional journals were sought for critical assessments and valuable conclusions.

3.4. Sample Design

The population in this study included 16 private commercial banks registered by NBE. Currently as per NBE (2015) publication No. 120 of Birritu magazine there are 19 banks in the country. But one of the governmental banks has merged with the biggest governmental bank and has decreased the number of banks in the country to eighteen. From the 18 banks in the country 17 of them are commercial and 16 are private owned or share companies.

A Purposive sampling method was employed by selecting the private commercial banks from the overall banks operating in the country by considering their recent five years from 2011/12 to 2015/16 operational period. A total of thirteen private banks were selected in order to construct the balanced panel model by excluding the three private banks i.e. Addis International bank, Enat bank and Debub Global bank because their operational period were below five years. The researcher had also taken the recent five years' secondary data to examine the relationship between explanatory variables and dependent variable.

Table 3.1: List of sampled private commercial Bank with year of formation

No.	Name of Banks	Est. Year
1	Awash International Bank	1994
2	Dashen Bank	1996
3	Bank of Abyssinia	1996
4	Wegagen Bank	1997
5	United Bank	1998
6	NIB International Bank	1999
7	Cooperative Bank of Oromia	2007
8	Lion International Bank	2006
9	Oromia International Bank	2008
10	Bunna International Bank	2009
11	Zemen Bank	2009
12	Abay Bank	2010
13	Berhan International Bank	2010

3.5. Data Analysis and Model

In order to achieve the objective of the paper, the study was conducted primarily based on panel data obtained through unstructured document review. According to (Baltagi 2005), the advantage of using panel data is that it controls individual heterogeneity, leads to less collinearity among variables and tracks trends in the data (something which simple time-series and cross-sectional data cannot provide). Hence, this panel data was examined using descriptive statistics, correlations and multiple linear regression analysis. Mean values and standard deviations were used to analyze the general trends of the data from 2011/12 to 2015/16 based on the sample of thirteen private commercial banks and a correlation matrix was also used to examine the relationship between the dependent variable and explanatory variables. A random effect method of panel multiple linear regressions model and t-static was used to determine the significance level of each independent variable in influencing deposit mobilization. The multiple linear regressions model was run using OLS through E-Views 8 econometric software packages, to determine the most significant and influential variables affecting deposit mobilization of the selected thirteen private commercial banks.

According to Petra (2007), OLS outperforms the other estimators when the following holds; the cross section is small and the time dimension is short. Therefore, as far as both the above facts

hold true in this study it was found reasonable to use OLS in this study. In connection to this, the general model for this study, as is mostly found in the existing literature is represented by;

$$\boldsymbol{Yi,t} = \propto + \boldsymbol{\beta Xi,t} + \boldsymbol{\varepsilon i,t}$$

The subscript $\boldsymbol{i}$ representing the cross-sectional dimension and $\boldsymbol{t}$ denote the time-series dimension. The left-hand variable$\boldsymbol{Yi,t}$, represents the dependent variable in the model, which is the banks' Deposit. $\boldsymbol{Xi,t}$ Contains the set of independent variables in the estimation model, is taken to be constant over time $\boldsymbol{t}$ and specific to the individual cross-sectional unit$\boldsymbol{i}$. If $\propto$ is taken to be the same across units, then OLS provides a consistent and efficient estimate of $\propto$ and$\boldsymbol{\beta}$.

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

$$\boldsymbol{DEPi,t = \beta 0 + \beta 1(NUMBRAi,t) + \beta 2(GDPi,t) + \beta 3(INFi,t) + \beta 4(LIQi,t) + \beta 5(IRi,t) + \varepsilon}$$

Where:

DEP = Total deposit of Private Commercial Banks

NUMBRA: Number of bank branches (NUMBRA) of bank i at time t

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

INF: Annual average general inflation rate of Ethiopia on the year t.

LIQ: Liquid asset to Deposit Ratio (Liquidity Ratio) of bank i at time t

IR: Weighted average interest rate

ε is an error term

The quantitative approach involved the use of regression analysis in estimating the relationship between deposits and variables that emerge as its factors variables. The bank deposit is the dependent variable, while inflation rate, deposit interest, branch expansion, liquidity, and GDP represent the independent variables.

Table3.2. Definition, notation, measurement and data Sources of the study variables

		VARIABLES	NOTATION	MEASUREMENT	SOURCES
Dependent Variable		Deposit	DEP	Logarithm of Deposit	Audited Annual Report & NBE
Independent Variables	Bank Specific factors	Number of Branches	NUMBRA	Number of Branches At The End of Year	Audited Annual Report & NBE
		Liquidity	LIQ	Liquid Asset to Deposit Ratio	Audited Annual Report & NBE
	Macroeconomic factors	Inflation Rate	INF	Average Annual Inflation Rate	NBE
		Deposit Interest Rate	DIR	Weighted Annual Deposit Interest Rate	NBE
		GDP	GDP	Real GDP Growth Rate	NBE

3.5.1. Variable Description

As stated in the first chapter the objectives of the study are to identify factors that affect deposit mobilization of the selected private commercial banks. The dependent and independent variables taken for the study are discussed as follows:

3.5.1.1. Dependent Variables

In the study, the total deposit mobilization of commercial banks in Ethiopia is the dependent variable. Deposit is an important source of working fund for the bank. Mobilization of deposit is one of the major objectives of the commercial banks and instruments to expand banking

operations. The successful functioning of commercial banks depends on the extent of funds mobilized.

3.5.1.2. Independent Variables

Independent Variables in this study are factors that mostly affect the commercial banks' deposits mobilizations. According to prior researches towards the determinants of banks' deposit, the independent variables are classified into bank-specific and non-bank specific or macro-economic variables (Valla et al. 2006 and Vodova, 2013). The bank-specific variables are internal factors and controllable by banks' managers while the macroeconomic variables are variables that are not related to bank management but reflect the economic and legal environment and are external factors.

3.5.1.3. Bank Specific Factors

Liquidity of the banks: Liquidity has diverse meanings according to the context within which it is used. Jason (2001) in his article "Liquidity: Advanced Trading Concept" defines it to be the ease at which assets can be turned into cash. Liquidity allows banks to meet depositors' and creditors' demand and so to maintain public confidence. Finger & Hesse, 2008, 2008, states that the liquidity situation of the bank also plays a significant role in determining banks deposit growth.

Liquidity is measured by the ratio of liquid assets to total assets or total loan to total deposit.

Key liquidity indicators such as central bank credit to financial institutions, deposits as a share of monetary aggregates, loans to deposits ratios, are important for open market operations and liquidity management (Sheku, 2005). Individual, business and government will be willing to deposit their money in banks if they are certain that they are safe to withdraw the money whenever they want, this is the question of liquidity of banks. The more liquid banks can attract the deposits more.

H1: Liquidity of commercial banks positively affects the deposits mobilized by commercial banks

Branch expansion: Branch expansion is opening new branches or service outlets in and outside the country. The availability of banking services in a country can be measured by the

total number of bank branches. The increase in the number of bank branches will have an effect on getting many depositors particularly those in far remote areas who are unbanked society. According to the article on NBE's magazine (Birritu No.113, February 2012), Ethiopia has low geographic and demographic penetration of bank branches. It is expected that banks make decisions on expanding their facilities by considering factors such as level of competition, deposit potential, regional income and existence of roads and vehicles.

More recently the branch expansion by the existing banks is fast increasing to reach out remote locations too to seize the resources available particularly deposits. This practice shows that branch expansion has positive and significant relation with deposit volume.

H2: Branch expansion positively affects the deposits mobilized by commercial banks

3.5.1.4. Macroeconomics Factors

These are macroeconomic conditions or sometimes policy factors that are not under the control of the commercial banks categorized for the purpose of the study.

Interest Rate: One of the most effective factors for deciding to deposit in banking system is the interest rate. Interest rate in the banking system is held as investment cost from the investor's point of view and opportunity cost from the depositor's point of view (Mohammad and Mahdi, 2010). Finger & Hesse, 2008 (2009) stated interest rate as one of the determining factor for commercial banks deposits.

Rose (2001) said that banks increase their deposits by offering higher deposit interest rate. The increase in interest rate on deposits is expected to improve the deposit volume in commercial banks as people are better attracted to get the advantage of higher interest payments on the deposits they held in banks. The attraction for getting the deposit from the surplus sector is interest payment, which must be reasonable and acceptable to the owner of the money. On the other hand, the attraction for granting credit facility by the bank is interest payment for the use of credit by the borrowers in consideration for parting with liquidity by the lenders.

Wubitu(2012) stated that there is a positive insignificant relationship between the two taking Commercial Bank of Ethiopia's deposit trend on her study. Hence, the interest rate and deposit volume at banks have a positive relationship.

H3: Interest on deposit positively affects deposit mobilization in commercial banks.

Inflation: Inflation is defined as the persistent increase in the general prices of goods and services within an economy over a given period of time (Ngula, 2012).Based on various literatures, inflation is assumed to affect private or personal saving either positively or adversely that stems from its direct or indirect impact. Inflation with effect in economic growth, employment, income distribution and wealth as well as social and political conditions of a country can influence its entire dignity. Banking system as an important effective factor in economic performance has also been under the influence of inflation.(Mohammad and Mahdi, 2010).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). With respect to the effect of inflation on savings, it can be mentioned that in general, all individuals who save a part of their incomes in banks are directly damaged by the inflation and their assets decrease in proportion with money value decrease (Mohammad and Mahdi, 2010).

During inflation, central banks employ monetary policy that would increase the cost of debt and decrease the availability of funds in banks. When the cost of borrowing increases and borrowing slows, the banks demand for fund decreases obviously the deposits will decrease. Hence, the direction of the relation between inflation and deposit volume is situational. Different studies show varying results regarding the directional relationship between inflation and deposit volumes. For instance, inflation is found to have negative relation with deposit in a study made in India by Sudin H.et.al.(2006).While, another case study in the same country by Athukorala. et.al. (2003) has shown the reverse direction.

H4: Inflation rate inversely affects bank deposit

Economic Growth & (GDP): Economic performance is generally being measured through GDP (Gross Domestic Product), a variable that has also become the de facto universal metric for 'standards of living. It is universally applied according to common standards, and has some undeniable benefits mainly due to its simplicity. GDP is one of the explanatory variables commonly used as determinants of economic growth.

According to (Finger & Hesse, 2008, 2008), growth is one of the determining factors for commercial banks deposits. GDP is calculated by adding up the value-added at each stage of production (deducting the cost of produced inputs and materials purchased from an industry's suppliers. (Erna & Ekki, 2004), finds four variables, GDP, number of Islamic bank's branch offices, profit sharing rate, and interest rate that are thought to have influence on the volume of deposits. So, GDP can influence the growth of commercial banks deposits.

Alemayehu, in his article published on MudayeNeway Magazine, states that many African studies show high degree of association between growth of an economy and saving. However, the causality issue (whether saving causes growth or the other way round) is not yet settled. He stated that most studies seem to suggest that economic growth influence saving. And economic growth is found to be the most important variable that has a significant positive effect on saving (Mudayeneway, 2015).

According to Jim (2008), the level of GDP divided by the population of a country or region is known as per capita income. Changes in real GDP per capita over time are often interpreted as a measure of changes in the average standard of living of a country. Thus the relation between income of the society and deposit volume is expected to be positive and significant. Studies by Mahendra (2005) and M. A. Baqui et al, (1987) both reveal that growth in income have a positive effect on deposits.

H5: Economic growth positively affects bank deposit

CHAPTER FOUR

DATA ANAYSIS AND DISCUSSION

This chapter analysis factors affecting deposit mobilization of selected private commercial banks, using the annual balanced panel data, where all the variables are observed for each cross-section and each time period. The study has a time series segment spanning from the period 2011/12 up to 2015/16 and a cross section segment which considered thirteen private commercial Banks.

As was stated in the first chapter, the main objective of the study was to identify the factors influencing deposit mobilization of private Ethiopian commercial banks. In order to achieve this objective, the model presented below was used.

$$\boldsymbol{DEPi,t = \beta 0 + \beta 1(NUMBRAi,t) + \beta 2(GDPi,t) + \beta 3(INFi,t) + \beta 4(LIQi,t) + \beta 5(IRi,t) + \varepsilon}$$

Where:

DEP = Total deposit of Private Commercial Banks

NUMBRA: Number of bank branches (NUMBRA) of bank i at time t

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

INF: Annual average general inflation rate of Ethiopia on the year t.

LIQ: Liquid asset to Deposit Ratio (Liquidity Ratio) of bank i at time t

IR: Weighted average interest rate

ε is an error term

The dependent variable in the model is Total Deposit (DEP) while the explanatory variables were; Number of branches, GDP (Economic Growth), Annual Inflation rate, Liquidity and deposit interest rate.

4.1. Results and Tests for CLRM

This part of the paper discusses the basic findings and presents the tests for the classical linear regression model. It is structured as follows. First, it gives the descriptive statistics of the variables used in the research. Second, it presents the results of correlation analysis and tests Classical Linear Regression Model assumptions respectively. Then the result of the regression analysis is presented in the last section.

4.1.1. Descriptive Statistics

The descriptive statistics of the dependent and explanatory variables for the selected commercial banks is summarized in Table-4.1. The table presents mean, median, maximum, minimum and standard deviation values for the dependent and independent variables for the total observation of 65.

Table 4.1: Descriptive Statistics of the Variables

	DEP	NUMBRA	GDP	INF	LIQ	IR
Mean	3.615719	77.33846	0.273032	0.163000	0.575765	0.031014
Median	3.712431	75.00000	0.224052	0.135000	0.577566	0.031211
Maximum	4.296974	213.0000	0.451588	0.341000	0.891170	0.049226
Minimum	2.420588	4.000000	0.153319	0.077000	0.404914	0.008306
Std. Dev.	0.416655	46.53738	0.116746	0.097617	0.084654	0.008749
Observations	65	65	65	65	65	65

Note: DEP Refers to deposit mobilization, NUMBRA refers number of branch in each year, GDP refers gross domestic product, INF refers to inflation, and LIQ refers to liquidity and IR Refers to Interest rate.

Source: Output of E Views 8

The logarithm of selected private commercial banks deposit was used for regression the mean DEP was 3.61 with the standard variation of 41.66 percent. This shows that deposit mobilization of the selected commercial banks have reached a log of 3.61 for the period taken. There were commercial banks that reported a DEP which was as high as 4.29; there were also other commercial banks with low mobilized deposit reported at log of 2.4. Deposit mobilization for the sample period has ranged from minimum 2.42 to maximum 4.29 with a standard deviation of 41.66 percent. Even if the range shows the existence of low level of variation in the group of deposit mobilization, the standard variation shows the existence of great variation in deposit mobilization among the selected private commercial banks.

The mean value of number of branch was 77.33; with the standard variation of 46.53 percent, while the maximum and minimum was 213 and 4. As shown in the result, there was high variation among private commercial banks regarding to branch expansion. This implies that the effort of some banks to expand branches was not strong. Over all variables branch expansion have highly affected deposit mobilization. The result also shows the more banks accessible the more deposit will be collected.

The other variable taken as an indicator that affects deposit mobilization is GDP. The mean value of this ratio shows 27.3pc; with standard variation of 11.7 percent, while the maximum and minimum was 45.1 and 15.3 percent respectively.

The annual average general inflation rate was 16.3pc with the standard variation of 9.7pc. The minimum and maximum value of average inflation rate according to descriptive result is 7.7pc and 34.1pc respectively.

The mean value of liquid asset to total deposit ratio (LIQ) was 57.57 with the standard variation of 84.7 pc. The maximum and minimum value of LIQ was 89.1pc and 40.5pc respectively. The mean value of bank deposit interest rate was 3.1 pc with the standard variation of 0.87 percent. The maximum and minimum of interest rate was 4.9 and 0.8percent respectively.

4.1.2. Correlation Relationship

One of the measures used to identify the degree of linear association between variables is correlation. Values of the correlation coefficient are always ranged between +1 and -1. A

correlation coefficient of +1 indicates that the existence of a perfect positive association between the two variables; while a correlation coefficient of -1 indicates perfect negative association. A correlation coefficient of zero, on the other hand, indicates the absence of relationship (association) between two variables (Brooks 2008). In this study, the researcher employed the Pearson product moment of correlation coefficient in order to find the association of the independent variables with the deposit mobilization private commercial banks.

As it can be seen from the result of the correlation matrix in Table-4.2, DEP (dependent variable) was negatively correlated with two of the GDP and INF explanatory variables. The DEP (dependent variable) and the two of GDP and INF moved in opposite direction.

The correlation matrix also shows that DEP is negatively correlated with GDP and INF. This indicates that commercial banks with GDP and INF will be having less deposit mobilization. DEP have a positive correlation with NUMBRA, LIQ and IR indicating that, when NUMBRA, LIQ and IR increase, banks deposit will also move in the same direction. The result also shows that DEP has a significant negative correlation with GDP ratio at -0.3297 and INF a significant negative correlation with deposit mobilization at -0.29155.

Table 4.2: Correlation (Pearson) Matrix

	DEP	NUMBRA	GDP	INF	LIQ	IR
DEP	1.000000					
NUMBRA	0.782561	1.000000				
GDP	-0.329790	-0.501996	1.000000			
INF	-0.291550	-0.490314	0.681784	1.000000		
LIQ	0.019577	0.239033	-0.232111	-0.152991	1.000000	
IR	0.443424	0.577937	-0.449320	-0.357819	0.512132	1.000000

Source: Output of EViews 8

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

In order to make the data ready for analysis and to get reliable results from the research, the model stated previously was tested for five multiple linear regression model assumptions.

Among them the major ones are: test for heteroscedasticity, autocorrelation, multicollinearity, normality and constant variable. Accordingly, the following sub-section presents the tests made

- ***Assumption one: the errors have zero mean (E (ε) = 0)***

The first assumption states that the average value of the errors should be zero. According to (Brooks 2008) if the regression equation contains a constant term, this presumption will never be breached. Therefore, since from the regression result table the constant term (i.e. β0) was included in the regression equation; this assumption holds good for the model.

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

Heteroscedasticity is a systematic pattern in the errors where the variances of the errors are not constant. When the variance of the residuals is constant it is referred as homoscedasticity, which is desirable. To test for the absence of heteroscedasticity Breusch-Pagan test was used in this study. In this test, if the p-value is very small, less than 0.05, it is an indicator for the presence of heteroscedasticity (Gujarati 2004). Accordingly, based on the result of Breusch-Pagan test the P-value is found to be greater than the level of significance (i.e., 0.11> 0.05). Hence, the variance of the residuals is constant and referred to as homoscedasticity.

Table 4.3: Heteroscedasticity Test: White test

Heteroskedasticity Test: White			
F-statistic	1.867908	Prob. F(21,43)	0.0412
Obs*R-squared	31.00835	Prob. Chi-Square(21)	0.0735
Scaled explained SS	14.84854	Prob. Chi-Square(21)	0.8305

Source: Output of E Views 8

- ***Assumption three: covariance between the error terms over time is zero*** $(\boldsymbol{cov\ (ui\ uj) = 0})$

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

According to Brooks (2008), presence/absence of autocorrelation is by using the Breusch–Godfrey test (shown in table 4.4). The result of the statistic labeled "obs*R-squared", which is the LM test statistic for the null hypothesis of no serial correlation shows a p-value of 0.1475 (which is far greater than 0.05) which strongly indicates the absence of autocorrelation.

Table 4.4: Autocorrelation test

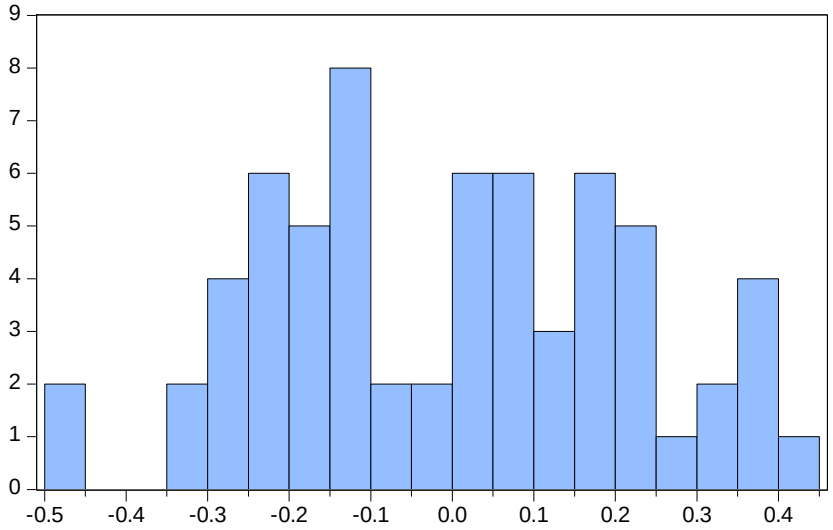
Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	3.942799	Prob. F(53,4)	0.0938
Obs*R-squared	63.77916	Prob. Chi-Square(53)	0.1475

- ***Assumption four: Normality (errors are normally distributed*** $\mu_{t\sim} N(0, \sigma^2)$

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

The normality tests for this study as shown in Figure 4.1 the kurtosis is close to 3, skewness close to 0 and the Jarque-Bera statistic has a p-value of 0.4611 which is well over 0.05 implying that the data were consistent with a normal distribution assumption.

Figure 4.2 Normality Test result



Series: Standardized Residuals	
Sample 2011 2015	
Observations 65	
Mean	-4.82e-16
Median	1.11e-16
Maximum	0.401607
Minimum	-0.484253
Std. Dev.	0.220662
Skewness	0.023531
Kurtosis	2.245409
Jarque-Bera	1.548143
Probability	0.461132

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

According to (Churchill and Iacobucci 2005), multicollinearity is concerned with the relationship which exists between explanatory variables. When there exists the problem of multicollinearity, the amount of information about the effect of explanatory variables on dependent variables decreases and as a result, many of the explanatory variables could be judged as not related to the dependent variables when in fact they are. How much correlation causes multicollinearity, however, is not still clearly defined. Many authors have suggested different level of correlation to judge the presence of multicollinearity. While (Hair, et al. 2006) argued that correlation coefficient below 0.9 may not cause serious multicollinearity problem. (Malhotra, 2007) stated that multi-collinearity problem exists when the correlation coefficient among variables is greater than 0.75. (Kennedy 2008) suggests that any correlation coefficient above 0.7 could cause a serious multi-collinearity problem leading to inefficient estimation and less reliable results. This indicates that there is no consistent agreement on the level of correlation that causes multi-collinearity.

Therefore, in this study correlation matrix for five of the independent variables is shown below in Table 4.5. The result of the estimated correlation matrix shows that the highest correlation of 0.681784 which is between inflation and Gross Domestic Product (GDP). Since there is no correlation above 0.75 and 0.9 according to (Malhotra 2007) and (Hair, et al. 2006) respectively, it can be concluded that there is no problem of multicollinearity.

Table 4.5: Correlation matrix between explanatory variables

	NUMBRA	GDP	INF	LIQ	IR
NUMBRA	1.000000				
GDP	-0.501996	1.000000			
INF	-0.490314	0.681784	1.000000		
LIQ	0.239033	-0.232111	-0.152991	1.000000	
IR	0.577937	-0.449320	-0.357819	0.512132	1.000000

Source: Output of E-Views 8

4.1.4. Regression results

There are broadly two classes of panel estimator approaches that can be employed in a panel data financial research: fixed effects models (FEM) and random effects models (REM) (Brooks 2008). Even if these two approaches end up with nearly the same result, there are situations that they will deviate widely. To check which of the two (FEM or REM) models provide consistent estimates (is preferred) for this study; Hausman test was employed and the result is presented as follows.

Table 4.6: Correlated Random Effects- Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.000000	5	1.0000
* Cross-section test variance is invalid. Hausman statistic set to zero.			

The null hypothesis of the Hausman test was that the random effect method is the preferred regression method. Table 4.6 showed the p-value for the test is 1.00 (which is well over 0.05), which indicates that the null hypothesis was not rejected. Hence, the random effect method was preferable. Thus, the relationship between deposit mobilization and the explanatory variables was examined by the random effects model in this study.

Accordingly, the result obtained by the random effect model is reported in Table 4.7 which shows regression results between the dependent variable (deposit mobilization) and explanatory

variables. The R-squared value measures how well the regression model explains the actual variations in the dependent variable (Brooks 2008). Thus, the R-squared value in Table 4.7 indicates that 71.9 percent variation in deposit mobilization of the selected private commercial banks was explained by the five independent variables (NUMBRA, GDP, INF, LIQ, and IR). The rest 28.05 percent variation in deposit mobilization was explained by residuals or other variables other than the five variables (for instance, exchange rate, profitability of the bank and macroeconomic variables and other factors not included here in the study, since these are beyond the scope of the study). The regression F-statistic (20.89) and the p-value of zero attached to the test statistic reveal that the null hypothesis that all of the coefficients are jointly zero should be rejected. Thus, it implies that the independent variables in the model were able to explain variations in the dependent variable.

Table 4.7: Regression Result- Random Effect Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.373746	0.250055	13.49202	0.0000
NUMBRA	0.007663	0.000859	8.921284	0.0000**
GDP	-0.444420	0.564354	-0.787484	0.4343
INF	1.160015	0.654678	1.771887	0.0818*
LIQ	-1.155639	0.404588	-2.856336	0.0060**
IR	7.376043	4.814604	1.532014	0.1311
VAR1	0.620163	0.242002	2.562639	0.0131
VAR2	0.565327	0.246718	2.291392	0.0257
R-squared	0.719519	Mean dependent var		3.615719
Adjusted R-squared	0.685074	S.D. dependent var		0.416655
S.E. of regression	0.233820	Durbin-Watson stat		0.691055
Sum squared resid	3.116280			
F-statistic	20.88892			
Prob(F-statistic)	0.000000			

**, * indicates significant at 5%, and 10% significance level respectively

Source: Output of EViews 8

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

$$DEP = 3.3737 + 0.00766NUMBRA - 0.4444GDP + 1.1600INF - 1.556LIQ + 7.376IR + \varepsilon$$

The R-squared of the regression result indicates 0.7195 which implies that 71.9pc of variation on DEP is explained by the variation of the included explanatory variables.

According to the regression result, the coefficient of NUMBRA is 0.00766 indicated that the numbers of branches have a positive and significant relationship with the deposit mobilization of commercial banks. Additionally, the magnitude of the NUMBRA coefficient suggests that a percentage change (increase) in number of branches deposit mobilization of selected private commercial banks increased by 0.766 percent.

The regression result also shows there is a positive and slightly significant relationship between inflation and deposit mobilization of private commercial banks having coefficient of 1.16pc. In this regard, inflation rate has little or no impact on deposit mobilization of the selected private commercial banks.

The result of the regression shows that interest rate has a positive but statistically insignificant relationship with deposit mobilization of the selected private commercial banks having coefficient of 7.3pc. In this regard, interest rate has no impact on deposit mobilization of the selected private commercial banks

To the contrary, the regression result of GDP (economic growth) indicates there is a negative insignificant relationship with deposit mobilization by having coefficient of 0.44pc.

The result also revealed that Liquidity (LIQ) has a negative but highly significant relationship with deposit mobilization of private commercial banks having coefficient of 1.5pc. This implies that holding other things constant, a percentage change in liquidity of the banks will result a decrease or vice versa in the deposit mobilization of the selected private commercial banks to the extent of 1.156 percent.

4.2. Testing of Hypothesis

The following section provides a detailed but brief analysis of the results for each explanatory variables and their importance in determining deposit mobilization of selected private commercial banks through testing hypothesis. In addition, the discussions analyze the statistical findings of the study in relation to the previous empirical evidences.

Hypothesis 1: *H0: NUMBRA has no positive and significant impact on deposit mobilization of Selected private commercial banks.*

H1: NUMBRA has a positive and significant impact on deposit mobilization of Selected private commercial banks.

The results of the random effect model in Table 4.8 indicated that the number of branches for the banks had a positive relationship with the deposit mobilization of the selected private

commercial banks and also this relationship was found to be highly significant (p-value = 0.000). Therefore, since the probability of committing type I error as indicated by the p-value is very low, it is possible to reject the null hypothesis. The beta coefficient value (0.0076) significant shows that, a percentage change in the number of branches of the banks will result in an increase change in the deposit mobilization of the selected private banks to the extent of 0.76 percent. This implies, the higher the extensive bank branches, the greater the potential for mobilizing deposit. Expansion of bank branches increases the amount of aggregate deposit and market share. The finding was found to be consistent with the findings of Hibret (2015); Shemsu (2015); Wubetu (2012) and some from local literatures.

Hypothesis 2*: H0: GDP has no positive and insignificant impact on deposit mobilization of Selected private commercial banks.*

H1: GDP has a positive and significant impact on deposit mobilization of Selected private commercial banks.

The results of the random effect model in Table 4.8 indicated that the GDP had a negative relationship with deposit mobilization of the selected private commercial banks but this relationship was found to be insignificant (p-value = 0.4343). Even if the relationship was negative as hypothesized, it was not significant. Therefore, since the probability of committing type I error as indicated by the p-value is very high, it is not possible to reject the null hypothesis. The beta coefficient value (-0.444) even if not significant, shows that a percentage change in the level of GDP will result in an inverse change in the deposit mobilization of the selected private commercial banks to the extent of 0.444 percent.

Hypothesis 3: H0: *INF has no positive and significant impact on deposit mobilization of Selected private commercial banks.*

H1: INF has a positive and significant impact on deposit mobilization of Selected private commercial banks.

The results of the random effect model in Table 4.8 indicated that inflation had a positive relationship with the deposit mobilization of the selected private commercial banks and also this relationship was found to be slightly significant (p-value = 0.0818). Therefore, since the

probability of committing type I error as indicated by the p-value is low, it is possible to reject the null hypothesis at 10% level of significance. The beta coefficient value (1.16) significant shows that persistent inflation has a positive but slightly significant effect on deposit mobilization of the selected private banks to the extent of 1.16 percent. This implies that there is direct relation between inflation rate and deposit mobilization. According to the finding of this study, in Ethiopia at the time of high inflation deposit mobilization of Ethiopian commercial banks is increase. Consumers motivated to save in inflationary period. The finding was found to be consistent with the findings of Wubetu (2012), (Fisseha 2017),Shemsu (2015) from local literatures. However, the result of (Muhammad, Khizer and Shama2011), (Siaw and Lawer2015) disagrees with this fact showing that it has a negative insignificant relation.

Hypothesis 4: *H0: LIQ has no positive and significant impact on deposit mobilization of Selected private commercial banks.*

H1: LIQ has a positive and significant impact on deposit mobilization of Selected private commercial banks.

The results of the random effect model in Table 4.8 indicated that liquidity for the banks had a negative relationship with the deposit mobilization of the selected private commercial banks and also this relationship was found to be highly significant (p-value = 0.000). Therefore, since the probability of committing type I error as indicated by the p-value is very low, it is possible to reject the null hypothesis. The beta coefficient value (-1.156) significant shows that, keeping other things constant, a percentage change in liquidity of the banks will result in a unit reduction or vice versa in the deposit mobilization of the selected private banks to the extent of 1.156 percent. This implies that the depositors are concerned with liquidity position which determines a bank's ability to respond to disturbance the withdrawal needs which are normally on demand or a short notice as the case may be because deposit is an obligation of the banks to pay the depositor during request. According to Nada (2010), Banks perceived as risky should have had more difficulty attracting deposits and making loans than banks perceived as safe. When banks fail to pay their depositors then they faces liquidity risk that makes other depositors not to deposit in that particular bank. The finding was found to be consistent with the findings of Jemeber (2014) and in line with Devinga, (2010), loans to deposit ratio is inversely related to liquidity and

consequently the higher the loans to deposit ratio the lower the liquidity which affects deposit growth and vice versa.

Hypothesis 5: *H0: IR has no positive and significant impact on deposit mobilization of Selected private commercial banks.*

H1: IR has a positive and significant impact on deposit mobilization of Selected private commercial banks.

The results of the random effect model in Table 4.8 indicated that the interest rate had a positive relationship with deposit mobilization of the selected private commercial banks but this relationship was found to be insignificant (p-value = 0.1311). Even if the relationship was positive as hypothesized, it was not significant. Therefore, since the probability of committing type I error as indicated by the p-value is very high, it is not possible to reject the null hypothesis. The beta coefficient value (7.376) even if not significant shows that, a percentage change in the level of interest rate will result in an increase change in the deposit mobilization of the selected private commercial banks to the extent of 7.376. Economic theory suggests that a rise in interest rate can have positive or negative effect on deposit growth. Consequently, this study conclude that deposit interest rate do not significantly affect deposit mobilization. The finding was found to be consistent with the findings of Wubetu (2012), (Nathanael and Eriemo 2014), (Mashamba et al. 2014), (Makined et al. 2016).

4.3. Summary of the findings

This chapter discussed the results of the documentary analysis and then presented the discussions of these results using the appropriate method. Accordingly, the chapter discussed the descriptive analysis, correlations between the variables and through the regressions analyses; it illustrates how the independent variables influence the dependent variable. Thus, a discussion of the result indicates that the number of branches of the banks, inflation, liquidity were statistically significant factors that affect the deposit mobilization of selected private commercial banks in Ethiopia. However, discussions of the result indicate that gross domestic product and interest rate were not a major explanatory variable for deposit mobilization of the banks in the Ethiopian banking industry. The next chapter presents conclusions and recommendations of the study.

The table below presents the expected result, significant level and actual result.

Table 4.8 Comparison of the Test Result with the Expectation

Independent variables	Expected Relationships with DEP	Actual result	Statistical Significance Test
NUMBRA	+	+	Significant
GDP	+	-	Insignificant
INF	-/+	+	Significant
LIQ	+	-	Significant
IR	+	+	Insignificant

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1. Conclusion

The main objective of this study was to examine factors that affect deposit mobilization of private commercial banks in Ethiopia using secondary data obtained from the annual audited financial statements of the banks under the study. Using 5 years data (2011/12-2015/16) and 13 private commercial banks, the study carried out by constructing balanced panel regression model and tested the classical linear regression models assumptions. Five factors that affect banks deposit mobilization were chosen and analyzed.

The explanatory variables used in order to achieve the objectives stated were; Number of branches, GDP, Inflation, Liquidity, and Deposit Interest Rate. Among these, Inflation and Number of branches were found to have positive and significant impact on deposit mobilization of selected private commercial banks. Deposit interest rate was also found to have positive but insignificant impact while, GDP and Liquidity were found to have negative but statistically insignificant and significant impact on deposit mobilization respectively of selected private commercial banks.

5.2. Recommendations

Based on the finding of this study the following recommendations and suggestions have been extended for private commercial banks which would possibly enhance their deposit mobilization.

- Since the main source of funds for commercial banks is deposit, private commercial banks should give due emphasis and strive to increase their branch network to all Ethiopian regions in order to increase it.

- It is observed that branch expansion is positively and significantly correlated with deposit mobilization. It is one of an important strategy for deposit mobilization. This implies that the growth of deposits will be larger if there are more bank branches. Consequently, it is advised that private commercial banks should expand their branches in order to increase

their deposit. And also the concentration regarding to the branch expansion should be both rural and urban areas.

- Banks should coming up with new, innovative and low cost services and also products and services targeting small business and low income groups to farmers that would ultimately broaden its customer base by focusing on the unbanked population to expand their deposit growth.

- It is finally recommended that interested researchers should dwell on the same area of this research extensively using a wider data and area of coverage.

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APPENDIXS

Appendix –I List of Private Commercial Banks in Ethiopia

No.	Name of Banks	Est. Year
1	Awash International Bank	1994
2	Dashen Bank	1996
3	Bank of Abyssinia	1996
4	Wegagen Bank	1997
5	United Bank	1998
6	NIB International Bank	1999
7	Cooperative Bank of Oromia	2007
8	LION International Bank	2006
9	Oromia International Bank	2008
10	Bunna International Bank	2009
11	Zemen Bank	2009
12	Abay Bank	2010
13	Berhan International Bank	2010
14	Addis International bank	2011
15	Debub Global Bank	2012
16	Enat Bank	2013

Appendix-II Autocorrelation

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	3.942799	Prob. F(53,4)	0.0938
Obs*R-squared	63.77916	Prob. Chi-Square(53)	0.1475

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 12/07/17 Time: 23:56
Sample: 1 65
Included observations: 65
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.335332	0.509609	0.658019	0.5465
NUMBRA	-0.005370	0.003994	-1.344609	0.2499
GDP	0.480454	1.162605	0.413257	0.7006
INF	-1.504338	1.848484	-0.813823	0.4614
LIQ	1.404245	1.229791	1.141857	0.3172
IR	-7.604381	12.26858	-0.619826	0.5689
VAR1	-0.494885	0.200676	-2.466096	0.0692
VAR2	-1.108200	1.415753	-0.782764	0.4775
RESID(-1)	0.208733	0.301400	0.692544	0.5267

RESID(-2)	0.043867	0.301267	0.145609	0.8913
RESID(-3)	-0.157311	0.549782	-0.286134	0.7890
RESID(-4)	-0.013295	0.232924	-0.057080	0.9572
RESID(-5)	0.209699	0.274766	0.763192	0.4879
RESID(-6)	0.096117	0.361861	0.265619	0.8037
RESID(-7)	-0.140266	0.402109	-0.348826	0.7448
RESID(-8)	0.017728	0.339714	0.052186	0.9609
RESID(-9)	0.264593	0.425328	0.622091	0.5676
RESID(-10)	-0.427300	0.302249	-1.413738	0.2303
RESID(-11)	-0.332608	0.477125	-0.697108	0.5241
RESID(-12)	0.036022	0.476600	0.075581	0.9434
RESID(-13)	-0.161400	0.900107	-0.179313	0.8664
RESID(-14)	-0.384944	0.461841	-0.833497	0.4514
RESID(-15)	-0.380894	0.445737	-0.854527	0.4410
RESID(-16)	-0.003801	0.793844	-0.004788	0.9964
RESID(-17)	-0.292296	0.846501	-0.345299	0.7473
RESID(-18)	-0.322689	0.552804	-0.583731	0.5907
RESID(-19)	0.031559	0.589720	0.053515	0.9599
RESID(-20)	0.072988	0.751637	0.097106	0.9273
RESID(-21)	-0.236509	0.520798	-0.454129	0.6733
RESID(-22)	-0.000270	0.555922	-0.000485	0.9996
RESID(-23)	0.330900	0.403248	0.820585	0.4580
RESID(-24)	-0.039066	0.551873	-0.070788	0.9470
RESID(-25)	-0.313304	0.543665	-0.576282	0.5953
RESID(-26)	0.159703	0.514236	0.310563	0.7716
RESID(-27)	0.159139	0.680608	0.233819	0.8266
RESID(-28)	-0.369214	0.560983	-0.658156	0.5464
RESID(-29)	-0.391596	0.910250	-0.430206	0.6892
RESID(-30)	-0.430049	0.737524	-0.583097	0.5911
RESID(-31)	0.157674	0.662067	0.238155	0.8235
RESID(-32)	-0.197299	0.755902	-0.261011	0.8070
RESID(-33)	-0.738827	0.937228	-0.788311	0.4746
RESID(-34)	0.038148	0.983409	0.038792	0.9709
RESID(-35)	-0.035998	1.810148	-0.019887	0.9851
RESID(-36)	0.158231	1.741325	0.090868	0.9320
RESID(-37)	-0.542176	1.002314	-0.540924	0.6173
RESID(-38)	-0.015439	1.385287	-0.011145	0.9916
RESID(-39)	1.324157	1.607217	0.823882	0.4563
RESID(-40)	-0.332700	2.301144	-0.144580	0.8920
RESID(-41)	-0.890018	1.282355	-0.694050	0.5259
RESID(-42)	0.265579	1.392798	0.190680	0.8581
RESID(-43)	1.116139	1.296255	0.861049	0.4378
RESID(-44)	-0.798837	1.614395	-0.494821	0.6467
RESID(-45)	-2.350568	2.805312	-0.837899	0.4492
RESID(-46)	-0.246008	2.423810	-0.101496	0.9240
RESID(-47)	0.511922	2.045355	0.250285	0.8147
RESID(-48)	-1.892703	2.610326	-0.725083	0.5085
RESID(-49)	-1.068429	4.504928	-0.237169	0.8242
RESID(-50)	-0.560689	4.588010	-0.122207	0.9086
RESID(-51)	0.005048	1.613265	0.003129	0.9977
RESID(-52)	-0.934760	1.985447	-0.470806	0.6623
RESID(-53)	-1.162229	4.290733	-0.270870	0.7999

R-squared	0.981218	Mean dependent var	-1.21E-16
Adjusted R-squared	0.699486	S.D. dependent var	0.220662
S.E. of regression	0.120965	Akaike info criterion	-2.297796
Sum squared resid	0.058530	Schwarz criterion	-0.257218

Log likelihood	135.6784	Hannan-Quinn criter.	-1.492657
F-statistic	3.482806	Durbin-Watson stat	0.934927
Prob(F-statistic)	0.114780		

Appendix- III Heteroskedasticity

Heteroskedasticity Test: White

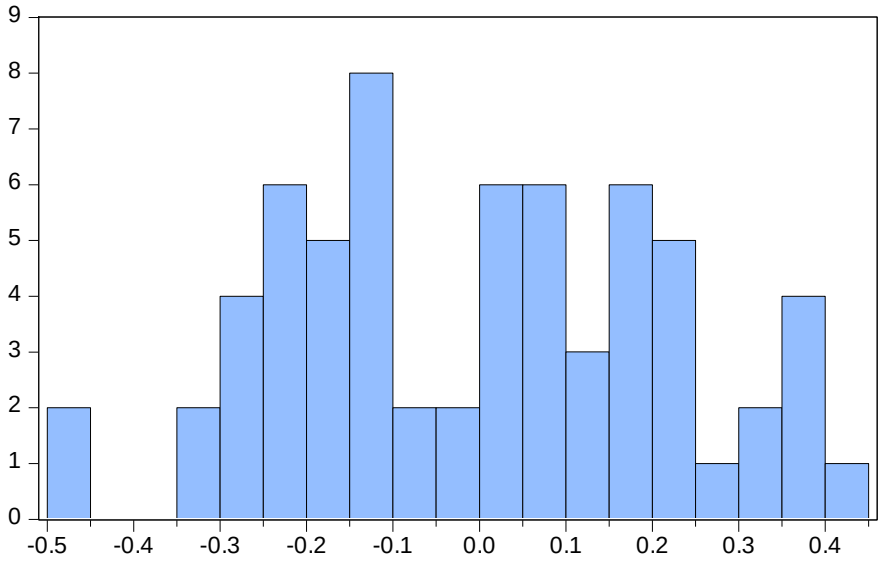
F-statistic	1.867908	Prob. F(21,43)	0.0412
Obs*R-squared	31.00835	Prob. Chi-Square(21)	0.0735
Scaled explained SS	14.84854	Prob. Chi-Square(21)	0.8305

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 12/08/17 Time: 00:08
Sample: 1 65
Included observations: 65
Collinear test regressors dropped from specification

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	30.27500	47.25175	0.640717	0.5251
NUMBRA^2	-3.33E-06	4.65E-06	-0.716433	0.4776
NUMBRA*GDP	0.008871	0.004712	1.882681	0.0665
NUMBRA*INF	-0.003471	0.005680	-0.611120	0.5443
NUMBRA*LIQ	0.013389	0.004849	2.761224	0.0084
NUMBRA*IR	-0.053496	0.046809	-1.142852	0.2594
NUMBRA*VAR1	-0.001864	0.000816	-2.284289	0.0274
NUMBRA*VAR2	-0.004907	0.005226	-0.938904	0.3530
NUMBRA	-0.007215	0.002266	-3.184697	0.0027
GDP^2	978.0382	1548.512	0.631599	0.5310
GDP*INF	-1434.266	2279.082	-0.629318	0.5325
GDP*LIQ	2.970126	2.294993	1.294177	0.2025
GDP*IR	-21.08115	22.34543	-0.943421	0.3507
GDP	-265.7476	417.9338	-0.635861	0.5282
INF^2	954.4133	1519.539	0.628094	0.5333
INF*LIQ	0.330620	2.297261	0.143919	0.8862
INF*IR	-14.21211	26.63449	-0.533598	0.5964
LIQ^2	1.155675	0.962808	1.200317	0.2366
LIQ*IR	-61.35624	25.94733	-2.364646	0.0226
LIQ	-1.249215	0.961787	-1.298848	0.2009
IR^2	230.4683	171.1519	1.346572	0.1852
IR	30.68528	13.57654	2.260170	0.0289

R-squared	0.477051	Mean dependent var	0.047943
Adjusted R-squared	0.221658	S.D. dependent var	0.053920
S.E. of regression	0.047570	Akaike info criterion	-2.989502
Sum squared resid	0.097304	Schwarz criterion	-2.253556
Log likelihood	119.1588	Hannan-Quinn criter.	-2.699124
F-statistic	1.867908	Durbin-Watson stat	1.615813
Prob(F-statistic)	0.041195		

Appendix-V Normality Test



Series: Residuals	
Sample 1 65	
Observations 65	
Mean	-1.21e-16
Median	4.44e-16
Maximum	0.401607
Minimum	-0.484253
Std. Dev.	0.220662
Skewness	0.023531
Kurtosis	2.245409
Jarque-Bera	1.548143
Probability	0.461132

Appendix-VI Correlated Random Effects-Hausman Test

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.000000	5	1.0000

* Cross-section test variance is invalid. Hausman statistic set to zero.

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
NUMBRA	0.001769	0.002651	0.000000	0.0012
GDP	-0.249911	-0.259968	0.000332	0.5810
INF	-0.022903	0.119086	0.001920	0.0012
LIQ	-0.533621	-0.647671	0.002981	0.0367
IR	19.188151	17.322694	0.536479	0.0109

Appendix- VII Regression Result

Cross-section random effects test equation:
Dependent Variable: DEP
Method: Panel Least Squares
Date: 12/08/17 Time: 00:26
Sample: 2011 2015
Periods included: 5
Cross-sections included: 13
Total panel (balanced) observations: 65

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.263042	0.138300	23.59399	0.0000
NUMBRA	0.001769	0.000776	2.277747	0.0273
GDP	-0.249911	0.254808	-0.980782	0.3317
INF	-0.022903	0.305512	-0.074967	0.9406
LIQ	-0.533621	0.250363	-2.131392	0.0383
IR	19.18815	3.150806	6.089918	0.0000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.955519	Mean dependent var	3.615719
Adjusted R-squared	0.939431	S.D. dependent var	0.416655
S.E. of regression	0.102542	Akaike info criterion	-1.487475
Sum squared resid	0.494202	Schwarz criterion	-0.885337
Log likelihood	66.34294	Hannan-Quinn criter.	-1.249893
F-statistic	59.39055	Durbin-Watson stat	2.407581
Prob(F-statistic)	0.000000		