



ADDIS ABABA UNIVERSITY
COLLEGE OF BUSSINESS AND ECONOMICS
DEPARTMENT OF ACCOUNTING AND FINANCE

**DETERMINANTS OF DEPOSIT MOBILIZATION OF PRIVATE
COMMERCIAL BANKS IN ETHIOPIA**

**A THESIS SUBMITTED TO THE DEPARTMENT OF
ACCOUNTING AND FINANCE IN PARTIAL FULFILLMENT
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SCIENCE (MSc) IN ACCOUNTING AND FINANCE**

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Declaration

Robenas Abrie, hereby declare that the research paper entitled “Determinants of deposit mobilization of private commercial Banks in Ethiopia” is my own work. This research is my original work and has not been presented to any other university and has not published anywhere in the form of books, monographs or articles, the other books articles and websites. Which I have made use are acknowledged at the respective place in the paper, and it is done in partial fulfillment of the requirement for degree of masters of Science in Accounting and finance.

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This is to certify that the thesis prepared by Robenas Abrie, entitled: **Determinants of deposit mobilization of private commercial Banks in Ethiopia** submitted in partial fulfillment of the requirements for the of Degree of Master of Science in Accounting and Finance complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

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List of Acronyms and Abbreviations

CLRM	Classical linear regression model
OLS	Ordinary least square
CPI	Consumer Price Index
ROA	Return on Asset
ROE	Return on Equity
NBE	National Bank of Ethiopia
GLS	Generalized least square
VIF	Variable inflation factor
LSDV	Least square dummy variables
POS	Point of Sale
DEPG	Deposit growth
INTRATE	Interest rate
GOEXP	Government expenditure
MOSU	Money supply
INFLN	Inflation
LAR	Loan -to- asset ratio
LR	Liquidity ratio
CR	Current ratio

Abstract

Effective mobilization of deposit plays a key role in keeping up the safety and reliability of financial system in general and commercial banks in particular. The general objective of the study is to investigate the determining factors of deposit mobilization of private commercial banks in Ethiopia by using a balanced panel data of 10 private commercial banks from 2009 to 2018. In preparing this research only secondary information has been used. The secondary data would be obtained from annual report of National Bank of Ethiopia and audited financial statements of sample private commercial banks. Explanatory research approach, with a quantitative research method was used to establish the causal effect relationship between determining factors (variables) and deposit mobilization of private commercial banks. Six determining variables (deposit interest rate, government expenditure, money supply, inflation, liquidity ratio and return on asset) as explanatory variables have been used for the study. For this study the researcher has used a purposive sampling technique from which 10 (ten) private commercial banks, which would provide and had complete ten year data, have been selected. The analysis process applied a quantitative technique of data presentation using tables and percentages. The investigation result using pooled OLS estimator reveals that, Inflation, government expenditure and return on asset have negative relationship with deposit growth of private commercial banks, while money supply, interest rate and liquidity ratio have positive relation with deposit growth of private commercial banks. Based on the findings and conclusion the researcher recommends that the liquidity management team of the bank should manage and supervise amount of asset which should be held as liquid assets so as to enhance deposit mobilization of private commercial banks.

Key terms: - Deposit mobilization and private commercial banks.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Strong, well-developed and efficient financial system is the key driven factor in economic development of countries and it has positive impact on economic growth. The financial system in every economy is dominated by the banking sector, since without banks; financial system cannot undertake the development of economy. Banks play intermediary role of mobilizing funds from savers (those who have excess funds) and subsequently lending them to investors (those who are deficient in funds) (Prasansha, 2018).

Economic growth is the common goal of all nations. Everybody lives with more comfortable, better standard of living than before and holding a better welfare because of the surge in economic growth. Government in each country aims to reduce poverty and increase the level of national income. Therefore, to achieve the main target of economic growth, governments may implement various kinds of policies such as encouraging saving, stimulating investment and production in their countries (Pinchawawee, 2011).

Mobilization of the domestic financial resources requires a country to have a proper institutional framework which encourages and mobilizes financial savings on one hand, and channels the mobilized funds for the purpose of capital formation leading to productive investment on the other. This role is best played by Commercial banks which are the basic component of financial institutions that promote stability in the financial system. Savings of households and other agents are collected to finance the investment needs of firms and consumption needs of individuals (Lomuto, 2008).

A developed Commercial banking sector also provides an institutional framework within which monetary policy can be conceived, implemented and become an effective instrument for macro-economic stability; administers a country's payments mechanism for both local and foreign transactions and achieves economies of scale in areas like risk pooling and portfolio diversification (Bave & Jansen, 2002).

Banks play a key role in improving economic efficiency by channeling funds from resource surplus unit to those with better productive investment opportunities. Banks also play key role in trade and payment system by significantly reducing transaction costs and increasing convenience (NCA, 2006). In less monetized countries, like Ethiopia, where financial sector is subjugated by banking industry, effective and efficient operation of the latter has significant role in accelerating economic growth.

According to Shemsu, (2015), Ethiopia commercial banks are the main controller of the financial system performing financial inter-mediation. They control greater portion of the investment funds from domestic deposits and are the main creditors of the corporate bodies, small and medium enterprises and individual investors. That is why the traditional banking business of supplying funds to the economy is still of importance. For example, most business organizations especially in Ethiopia are highly dependent on bank loans as a source of capital and the ability of banks in giving loan depend much on their ability to attract deposits. Even though, mobilizing deposit is the major activity of all commercial banks, managing and identifying the determining factors of deposit is a mandatory task for banks. Mobilizing deposits is not possible without knowing and controlling the factors affecting it.

With regard to financial costs, most of institutions apply differentiated interest rate schedule, compensating for the higher administrative costs with no or low interest rates on small savings and increasing them according to the size of the deposit (Elser, et al., 1999, cited in Byusa, 2016).

Saving mobilization by commercial banks by and large depends on the rate of return in terms of interest rate they give to depositors the higher the interest rate the more likely they are to mobilize more savings (Peter, 2016).

Commercial banks are the most important savings mobilization and financial resources allocation institution. Eventually those roles make them an important phenomenon in economic growth and development. In order for them to perform these roles, it must be realized that banks have the potential, scope and prospects of financial inter-mediation (Olusanya et al., 2010).

Variables which are claimed to have effect on the commercial banks deposits can be classified into two, namely exogenous and endogenous factors. Exogenous has further divided into country specific factors and bank specific factors for clarification purpose. Endogenous factors can be

controlled by the banking system; however, the exogenous factors cannot be controlled by the banking system. The bank specific factors are factors that are specific to the banking system and the country specific factors are factors that are beyond the banking system (Desinga, 1975). Therefore, the exponential that initiates the researcher to conduct the study is to identify those internal and external factors affecting the deposit mobilization of private commercial banks, and to forward recommendations or find solutions for those factors.

Mobilization of financial resources and lending these resources to business firms or individual traders engaged in nearly all economic sectors. As a commercial bank, private commercial banks in Ethiopia render various services to their customers among which collecting deposit and lending money are the principal business activities which makes those banks profitable.

Effective mobilization of deposit plays a key role in keeping up the safety and reliability of financial system in general and commercial banks in particular. It is therefore necessary to point out the determining factors affecting deposit mobilization of private commercial banks in Ethiopia. Thus, results from empirical studies reviewed on the relationship between deposit mobilization and the various determining factors are positive, negative and mixed. In addition, the results that the previous studies discussed all were not be generally applicable enough to Ethiopia's commercial banks particularly privately owned banks, as most of the research conducted covering small period and the sample was small percentage of total taken from specific region. This study will seek to investigate the main factors affecting deposit mobilization of private commercial banks in Ethiopian.

1.2 Statement of the problem

Deposit mobilization is an indispensable factor to increase the sources of the banks to serve effectively. Mobilization of deposit plays an important role in providing satisfactory service to different sectors of the economy. The successful functioning of commercial banks depends on the extent of funds mobilized. Deposits are the life blood of banking companies. There are different types of deposits, with different maturity pattern carrying different rates of interests. Deposit mobilization is depending on the cost of deposits. Mobilization of deposits for a bank is as essential as oxygen for human being, (Deb, 1988).

However, deposits mobilization is affected by self-fulfilling prophecies. If policy makers assume that certain people or institutions are too poor to save, and then implement policies that severely limit their access to deposit facilities, one should not be surprised when few deposits are mobilized. It goes without saying that individuals must have easy access to deposit services to facilitate deposit mobilization. Potential depositors are highly sensitive to the transaction costs that are imposed on them by deposit takers, especially the time and distance involved in making small deposits (Demirguc & Detragiache, 1998).

Deposit mobilization is an integral part of banking activity. Mobilization of savings through intensive deposit collection has been regarded as the major task of banking in Ethiopia today (Samuel, 2015). Despite those encouraging changes in its structure, the Ethiopian financial sector is not diversified in terms of the type of institutions delivering the service and the type of financial products being delivered. The financial service is dominated by a cash based system. Moreover, there is no stock market and the financial market comprising the inter-bank money and foreign exchange markets as well as the bond and Treasury Bills market is at an infant stage accommodating limited amount of transactions (Zewdu, 2014).

The fast growing economy of the country, which is proactively investing in road infrastructure, building hydro power dams, constructing thousands of housing condominiums and expanding agricultural and other investments in the country are hugely relying on the commercial banks for loans and credits. Moreover, there have been multiple small enterprises incubated in the last decades and increasing number of import and export companies, heavily relying on commercial banks for loans, foreign currency and trade assurances. This calls for an increased demand for deposit mobilization from public institutions, private sector and other potential contributors (Hibret, 2015).

Ethiopia's rate of domestic saving has been very low. From 1997 to 2010, the average saving rate in low-income countries of the region was about 9 percent, while it was about 19 per cent for middle-income countries. In the same period, the average saving rate of fragile sub-Saharan African states was 11.5 per cent, still significantly higher than Ethiopia's rate of 4 per cent. (Abay, 2010)

The banks are not successful in controlling and managing deposit because of variation in management they did to know those factors that can affect the deposit (Balachandher, 2002). As the researches' conducted in this particular area were not be generally applicable enough to Ethiopia's commercial banks particularly privately owned banks, as most of the research conducted covering small period and the sample was small percentage of total. The researcher was motivated to undertake a research in this particular area to fill these gaps. Identifying those factors and appreciation would be significant for the successful operation of the organization because those factors would be a means for measuring the weakness and strength to realize the changing business environment.

Therefore, the purpose of this study is, to evaluate the tendency and intensification of deposit mobilization and recommended ways for enhancing the capacity for mobilizing concentrating the case mainly on private commercial Banks in Ethiopia.

1.3 Objectives of the study

1.3.1 General objective of the study

The main objective of the study is to examine the determinants of deposit mobilization of private commercial banks, in Ethiopia.

1.3.2 Specific objectives of the study

The specific objectives of the study are as follows:

- To examine the effect of deposit interest rate on deposit mobilization of private commercial banks.
- To examine the effect of inflation on deposit mobilization of private commercial banks.
- To examine the effect of Government Expenditure on deposit mobilization of private commercial banks.
- To examine the effect of Liquidity on deposit mobilization of private commercial banks.
- To examine the effect of Money Supply on deposit mobilization of private commercial banks.
- To examine the effect of Return on Asset on deposit mobilization of private commercial banks.

- To estimate a model that explains the factors which determine private commercial banks deposit.

1.4 Hypothesis of the study

The following hypotheses were developed for the study

H1: Deposit interest rate has a positive and significant effect on private commercial banks deposit.

H2: Inflation has a negative and significant effect on private commercial banks deposit.

H3: Government Expenditure has a positive and significant effect on private commercial banks deposit.

H4: Liquidity Ratio has a positive and significant effect on private commercial banks deposit.

H5: Money Supply has a positive and significant effect on private commercial bank deposit.

H6: Return on Asset has a negative and insignificant effect on private commercial banks Deposit growth in Ethiopia

1.5 Importance of the study

The study would have great contribution to the existing knowledge in the area of factors determining deposit mobilization in the case of private commercial Banks of Ethiopia. The study can be used to identify both internal and external factors affecting deposit mobilization and help banks to design and implement effective deposit mobilization strategies.

In addition, this study would increase the experience of the researcher to do any other researches and it contributes to the existing literature by providing evidence on the relation between the stated factors and banks' deposit mobilization. Furthermore, this study would have a paramount importance in providing a better ground for different stakeholders such as bank managers, Board of directors, employees and policy makers. It may also serve as a stepping stone for future researchers who want to conduct an in-depth study on related topics.

1.6 Scope and limitations of the study

The scope of the study is to examine the determinants of private commercial banks deposit mobilization. The study investigated 10 (ten) selected private commercial banks (Awash Bank

S.C, Abyssinia Bank S.C, United Bank S.C, Wegagen Bank S.C, Nib International Bank S.C, Dashen Bank S.C, Cooperative Bank of Oromia S.C, Lion International Bank S.C, Oromia International Bank S.C, and Zemen Bank S.C) which are licensed and supervised by the National bank of Ethiopia (NBE) and operating in Ethiopia.

Furthermore, the study examines the determinants of private commercial banks deposit mobilization by taking evidence from private commercial banks in Ethiopia for the period of ten years running from 2009 to 2018. This period was chosen to include second generation private banks in a sample and to get the most recent ten year data. The dependent variable of this research incorporated deposit mobilization. The explanatory variables are deposit interest, inflation, government expenditure, liquidity ratio, money supply, and return on asset.

As a limitation, in this study the sample banks were selected purposively based on the availability of data. This may introduce bias inherent with non-probability sampling method. And the generalizability of the study limited due to the exclusion of other variables that may affect the deposit mobilization of private banks, such as customer satisfaction and quality of managerial staffs.

1.7 Organization of the study

The study was organized in to five chapters. The first chapter presents what the study is about and gives a brief introduction about the study, the problem statement, the objectives, hypotheses, significance, scope and limitations of the study and organization of the study. Chapter two reviews a highlight of theoretical and empirical reviews of the literature and conceptual framework relevant to the study. The third chapter provides description about the methodology and the variables used in the study and the fourth chapter presents the results and discussions of the study conducted based on data collected. The study come to end up with chapter five with the conclusion and recommendations, in a manner that relates to the topic, determinants of deposit mobilization of private commercial banks in Ethiopia.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Chapter overview

This chapter presents the reviewed literature on deposit mobilization in accordance with the study objectives. It presents a theoretical conceptualization the role of private commercial banks in deposit mobilization, saving mobilization, in Ethiopia, and empirical evidence on factors that influence deposit mobilization. Finally, a summary identifying the gaps and justifying the relevance of this study is presented.

2.2 The concept of deposit mobilization

Banks mobilize deposits by making finances and by investing in various financial markets. Basically deposit mobilization is related to the creation of credits. The banks would have special campaigns where they would interact with a lot of people and invite them to make deposits with their bank. Commercial banking is a service industry with a high degree of built in profit potential (Meenakshi, 1975). Commercial banks mainly depend on the funds deposited with them by the public to lend it out to others in order to earn interest income (Davinaga, 2010).

Banking is one of the oldest professions in human history, it also flourished with civilizations. Since humans started, using money bank services were in use throughout history. Modern banking as we know it today was established in Italy and Greece in the 15th century. Today, banks are one of the most important institutions for a modern economy to work in any country (Gedey, 1990).

Deposit mobilization is an integral part of banking activity. Mobilization of Savings through deposit collection has been regarded as the major task of banking industry. A deposit mobilization is an indispensable factor to increase the sources of the banks to serve effectively. Mobilizing deposits play an important role in development of all spheres of economy (Shettar, 2014).

Different historical sources states that the first foundations of the banking service in the world were put by goldsmiths and silversmiths. They have a safe box to put & they were the most trusted. They used to receive gold, silver and various jewelries to put with them. Therefore, an

individual or a merchant puts his wealth under their custody, for their service they charge a small amount of money and give the customer a receipt to guarantee their acceptance. Then they started using, money paying instrument what we now call this document as 'check'. However, as time goes by, the goldsmiths and silversmiths observed that their customers wouldn't take their jewelry soon, and those clients, whenever they face the shortage of money, they started lending to this people and started to get profit from their service. They encouraged depositing and lending and rather than making the customers to pay a charge for depositing, they started to pay them interest and introduced the public to work with money. It is believed that, ancient Assyrians, Babylonians, Athenians, Romans and Abyssinians also used the banking service (Gedey, 1990).

Banson (2013), defined deposit mobilization as the collection of cash or funds by a financial institution from the public through its current, savings and fixed amounts and other specialized schemes. Normally deposits are considered as the cost effective working funds that can increase the sustainability and profitability of the deposit taking institutions (Garo, 2015).

Richard et al., (2015), also defined deposit mobilization as the main function of financial institution. Mobilizing funds from the surplus economic agents to the deficit economic agents is the process of deposit mobilization and it is thus affected to increase the economic growth.

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. Furthermore, the key role of the loans, banks offer the more profit they make. However, the success of the deposit mobilization process depends on development of the financial system as well as the strategic practices adopted by banks (Richard, 2015).

2.3 Theoretical and Conceptual Literature Review

There are articles, journals and different information on the issue of the commercial banks deposits and the factors which controls the commercial banks deposits. Some authors had classified the factors and explain their relationship with commercial banks deposits.

Commercial Banks deposits are dependent on depositor's money as a source of funds. According to the Keynesian theory of demand for money, there are three main motives why people hold

money: transactions, precautionary and investment motives. In order to cater for these motives, commercial banks offer three categories of deposit facilities that are demand, savings and time deposits. Demand deposit facility is most commonly referred to as current account and is designed for those who need money for transaction purposes. This motive can be looked at from the point of view of consumers who want income to meet their household expenditure and from the viewpoint of businessmen who require money and want to hold it in order to carry out their business activities. Hence, the purpose of deposit facility is for convenience or for making daily commitments (Shemsu, 2015).

Bank deposits represent the most significant components 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 (Sergeant, 2001). Bank deposits are made to deposit accounts at a banking institution, such as savings accounts, checking accounts, time deposit accounts and money market accounts. The account holder 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 liability rather than to the actual funds that are deposited.

Financial sector mainly constitute 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). Examples include commodity markets, money markets and capital markets. Financial institutions (intermediaries) are institutions that provide financial services for their customers. 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:

1. Depository institutions (e.g. commercial banks, savings institutions, credit unions) that obtain funds mainly through deposits from the public; and,

2. 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.

Commercial banks are the most dominant depository institution. They serve investors by offering a wide variety of deposit accounts, and they transfer deposited funds to deficit units by providing direct loans or purchasing debt securities. Commercial banks serve both the private and public sectors, as their deposit and lending services are utilized by households, businesses, and government agencies.

2.3.1 Commercial Bank Deposit

Commercial bank deposits are major liabilities for commercial banks. (Kelvin, 2001) said that deposits of commercial banks account for about 75% of commercial banks liabilities. Commercial banks keep lending as long as they possess adequate deposit.

Therefore, banks will be better off if they are mobilizing more deposits. However, as (N. Desinga, 1975) indicates deposit mobilization is a very difficult task. The cost of intermediation for mobilizing deposits is also very important part of overall intermediation cost of the banking system as (E.A. Shaw 1995) indicates. In spite of the difficulties, deposits play an important role not only to the banking sector but also the overall economy.

All the financial performance of most of the commercial banks in one way or the other related to the deposit it managed to be mobilized. Deposits provide limits to the working capital of the bank. The higher the deposit, 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 foundation up on which banks thrive and grow and deposit is unique items on a bank's balance sheet that distinguish them from other type of business organizations.

Commercial banking is a service industry with a high degree of built in profit potential (Meenakshi, 1975). Commercial banks mainly depend on the funds deposited with them by the public to lend it out to others in order to earn interest income (Davinaga, 2010). However, banks

attract deposits by paying a risk free return to the savers. Interest expense is number one expense on the income statement of most commercial banks. (Hamid 2011) said that if banks lose their deposit base they rely on non-deposit based funding that is very expensive and consequently minimize the profit margin.

2.3.2 Major Types of Deposit products

Deposit account is a savings account, current account or any other type of bank account that allows money to be deposited and withdrawn by the account holder. These transactions are recorded on the bank's books, and the resulting balance is recorded as a liability for the bank and represents the amount owed by the bank to the customer. Some banks may charge a fee for this service, while others may pay the customer interest on the funds deposited. The account holder has the right to withdraw any deposited funds, as set forth in the terms and conditions of the account. The following are most common type of bank deposit.

Demand Deposit: it consists of funds held in an account from which deposited funds can be withdrawn at any time without any advance notice to the depository institution. Demand deposits can be "demanded" by an account holder at any time. 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: is a deposit account held at a bank or other financial institution that provides principal security and a modest interest rate. 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.

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. Generally speaking, the longer the term the better the yield on the money (Dereje, 2017).

2.3.3 Enterprise Risk Management Theory

Enterprise Risk Management is a new approach for companies to identify and manage their risk. Enterprise Risk Management can be defined as a systematically integrated and discipline approach in managing risks within organizations to ensure firms achieves their objective which is to maximize and create value for their stakeholders. There are two key points that must be highlighted according to the definitions given above. The first key point is the main role of enterprise risk management. it integrates and coordinates all types of risks across the entire organization. It means that risks cannot be managed in silo approach. All risks occurred in the entity must be combined and managed in enterprise approach. The second key point is by using enterprise risk management, users are able to identify any potential incidents that may affect the organization and know their risk appetite. If the risk-appetite is specifically known, any decision made by the organization to curb risks may be parallel with the firm's objective (Walker et al., 2003).

According to Alviunessen and Jankensgård, (2009) point out that Enterprise Risk Management is concerned about a holistic, company-wide approach in managing risks, and centralized the information according to the risk exposures. They use the term —Risk Universell, which is the risk that might impact on the future cash flow, profitability and continued existence of a company. In other words, risk universe is risk that could affect the entity of the company. If risk universe can be identified, the next step is to take an appropriate action such as risk mapping process, accessing the likelihood and impact and curb the risk based on the organizations' objective.

In addition, Li and Liu (2002) define strategic risk as the uncertainty of loss of a whole organization and the loss may be profit or non-profit, while Mango (2007) points out that there is no specific definition of strategic risk due to the inability to well-define and understand it. Strategic risk may arise from regulatory, political impediments or technological innovation. Risk is more related to internal problems, such as employee fraud, corporate leadership, segregation of duties, information risk and product flaws.

Furthermore, Lam (2000), practicing Enterprise Risk Management should be observed upon three perspectives: globalization; changes in the role of risk managers; and regulatory. From the

globalization perspective, it created multiple risks perceptions, fast growing technologies and inter dependency of risks. From the role of risk manager, risks should not be treated as a trouble, but also as an opportunity. Finally, from the regulatory oversight factors perspective, appointing chief risk officer and the establishing risk management committee, the adoption of enterprise risk management will become a reality.

The major risks in banking business include; liquidity risk, interest rate risk, market risk, credit or default risk and operational risk. The liquidity risk of banks arises from funding of long term assets by short-term liabilities, thereby making the liabilities subject to rollover or refinancing risk. Liquidity risk is the possibility that an institution may be unable to meet its maturing commitments or may do so only by borrowing funds at prohibitive costs or by disposing assets at rock bottom prices (Kumar et al., 2005). Market risk results from adverse movements in the level or volatility of the market prices of interest rate instruments, equities, commodities, and currencies. Credit risk is a risk that the interest or principal or both will not be paid as promised. Credit risk is borne by all lenders and will lead to serious problems, if excessive. Loans are the largest and most obvious source of credit risk in banks. Operational risk is the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events. Thus, operational loss has mainly three exposure classes namely people, processes and systems. Agents should have ways to mobilize cash deposits from customers to avoid such scenarios whereby a customer will come to withdraw money and the bank agent will lack cash to pay the customer (Kumar et al., 2005).

2.4 Empirical Literature

2.4.1 Deposit mobilization and deposit interest rate

One of the most effective factors for deciding to deposit in banking system is the interest rate (Mohammad & Mahdi, 2010). The increase in deposit 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. Herald & Heiko (2009), stated interest rate as one of the determining factor for commercial banks deposits. Philip (1968), also states that the offering of attractive interest rate on bank deposits may be considered to have had a beneficial effect. 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 deposit rate and deposit volume at banks have a positive relationship.

Furthermore, Mustafa & Sayera (2009) said that low deposit rates are discouraging saving mobilization. Bhatt (1970) also supposed that the banking system is unlikely to be able to meet the demand for bank credit unless concerted policy is pursued to raise the rate of saving generally and the rate of saving in the form of deposits in particular.

Deposit interest rate can be defined as the reward or profit have been paid to depositors with respected to their deposited money. This reward is for sacrificing present consumption for the future consumption (Garo, 2015). Keynes defines the interest rate as the reward for parting from liquidity. However, there is a question as why there should be a reward or interest payment for sacrificing liquidity. This question can only be solved by considering the benefits of hoarding money at hand. Money is considered as a perfect liquidity asset. Money can be exchanged for goods and services anytime, anywhere in order to fulfill their needs and wants. Also, when they hoard money, they can recuperate them for unforeseen circumstances. Moreover, when people keep money in another source of asset there will be a risk associate with that. These factors emphasize that people can be benefited through hoarding money. However, if they deposit money they have to sacrifice these benefits. Interest is paid as a reward for these sacrifices (Hettiarachchi, 2005). According to classical economists, they accounted that there is a positive relationship between interest rate and the number of savings.

2.4.2 Deposit mobilization and Inflation

According to (Fischer, 1993 cited in Akaninyene et al., 2018), Inflation is explained as continuous rise over time in the prevailing price level of goods and services in an economy. This rise in prevailing prices of goods and services translates to the monetary unit purchasing less goods and services. Hence it can be concluded that inflation mirrors decreasing purchasing power per unit of the country's currency, reduced value of goods and services in the medium of exchange and unit of account within the economy. Fisher further mentioned that a key evaluation of price inflation is the inflation rate, which is measured by the percentage increase or decrease in a general price index annually (proxies by the consumer price index) over time.

Higher inflation has a negative relationship with earnings that accrue to savers and investors in financial markets. This is said traceable to two rationales: First, to demonstrate the variability, the savings function would have to shift behind. This first rationale has virtually few or no observed documentation to support the validity scientifically. Secondly, almost all scientific documentation is of the proposition that savings is not adequately responsive to rates of earnings to justify large inflationary effect (Choi, Smith & Boyd, 1996).

This assertion is supported by Bruno & Easterly, (1995), when they demonstrated that a many economies have suffered prolonged inflation of between 20 and 30 percent without severe negative results. Nonetheless, assuming the level of inflation goes beyond biting point which they estimated estimate to be about 40 percent, there is bound to be compelling and serious reduction in the general level of real activity. This agrees with the conclusion of Bullard & Keating (1995).

There is also evidence suggesting that inflation negatively influences the distributive activities of capital markets, dampening the level of trading and transactions in those markets as well as reduction in the earnings of investors. Boyd, Levine, & Smith, (1996) verified this with a cross sectional analysis that divided economies in terms of their mean rates of inflation. The result showed that countries with lowest inflation quartile witnessed highest level of transactions in the financial market and vice-verse. The consideration of deposit mobilization by banks as a function of low inflation is almost a global consensus, especially as it relates to macroeconomic stability. In general, problems associated with inflation includes but not limited to the following:

The increased volume of money in circulation during high inflation results in every person in the economy having money but very little goods to buy. This is because the inputs of production acquired with huge cash is small, hence the output that is not sufficient for consumers. Again Low Capital Formation is experience during inflation. Capital formation which is the production of building, machinery tools and equipment that will help producers in producing more is bound to decrease as a result of low savings (Innocent & Aniekpeni, 2018). In addition, Inflation also favor's the borrower and harms lender. I.e. since inflation leads to the fall in the value of money, a borrower at the time of payment of his debt will be paying back an amount whose value has fallen. Inflation may also retard the economic growth because of the redistribution effect, discourages domestic savings and contribute to capital flight from foreign investors.

2.4.3 Deposit mobilization and Government expenditure

Government expenditure refers to all monetary expenditure on goods and services made by the government on behalf of the community. It includes both recurrent and capital expenditure on items like health, education, administration and so on. The recurrent expenditure refers to the expenditures that occur at regular intervals in the annual budget of the government. These expenses include expenditure on defense, administration and debt servicing particularly payment of interest on loans, road maintenance, and cost of health and education services (Lambert, 2015).

The availability and mobilization of resources is a sine qua non for real capital formation and, hence, national development. Sustainable development can only be achieved if resources are efficiently mobilized and transformed into productive activities. The development of an efficient financial system in providing the vital link between savings and investment is thus important. Not only must there be coordination of different agencies within and among levels of government, there must also be coordination between the public and private sectors, and among the various components of the private sector (Mohamed & Lim, 2001).

Whatever the level of domestic savings and large or small the net transfer of foreign savings, there is legitimate concern to ensure that those savings are allocated to investment in a developing country in a manner that is efficient and desirable in the social, political and developmental senses. Apart from having a well-coordinated financial system, the appropriate infrastructure, human capital and institutions all have to be in place (Mohamed & Lim, 2001).

2.4.4 Deposit mobilization and Liquidity ratio

An important measure of liquidity is loan to deposit ratio. The loans to deposit ratio is inversely related to liquidity and consequently the higher the loans to deposit ratio the lower the liquidity and vice versa (Davinaga, 2010). 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). Voon-Choong et al., (2010), also stated that 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.

Liquid banks as well as banks with a higher loan exposure are associated with higher deposit growth. Herald & Heiko (2009), also argued that the liquidity situation of the bank also plays a significant role in determining banks deposit growth.

2.4.5 Deposit mobilization and Money supply

According to (Al-Qudah & Jaradat, 2013), Money supply is a measure of the total amount of money in an economy. Money supply is the summation of currency in circulation, demand deposit, time deposit and saving deposit. Therefore, Money supply is the amount of money within a specific economy available for purchasing goods or services.

The broad definition of money supply is adopted which includes currency in circulation, demand deposits, quasi-money and foreign currency deposits. The money creating activities of the deposit money banks impact directly on money supply and given that the central bank is responsible for controlling money supply in an economy, it is important to evaluate the role of these banking institutions on the convergence process. Excess money supply, whether created through the direct or indirect channels, influences economic activity (growth) and may provide downside risks on macroeconomic stability, impacting negatively on inflation, interest rates and exchange rate (Kibebe, 2016).

2.4.6 Deposit mobilization and Return on Asset

Many researchers have found return on asset to be significantly related to rural banks deposit mobilization. Haron & Azmi, (2006) in their study investigates the structural determinants of deposits level of commercial banks in Malaysia, using co integration techniques. The results suggest that determinants such as rates of profit of Islamic bank, rates of interest on deposits, Base Lending Rate, Kuala Lumpur Composite Index, Consumer Price Index, Money Supply and Gross Domestic Product have significant impact on deposits. We also find that in most cases, customers of conventional system behave in conformity with the savings behavior theories. The known measures of banks deposit performance over the years have been either based on return on assets or return on equity. However, in the measuring these performance, many researchers have argued for the return on assets (ROA) as against return on equity (ROE). According to (Lambert, 2015), “ROA shows the profit earned per dollar of assets and most importantly, it reflects the management's ability to utilize the banks financial and real investment resources to

generate profits. For any bank, ROA depends on the bank's policy decisions as well as on uncontrollable factors relating to the economy and government regulations”.

In conclusion, this study is different from previous works done by others, because it would examine core internal and external determinants of deposit mobilization by private commercial banks in Ethiopia and then assesses the quantitative importance of these determinants. The focus is on deposits in private commercial banks, and its mobilization of these deposits and how the private commercial banks use these savings for capital formation.

2.5 Empirical Review about Determinant of Ethiopian’s Commercial Bank Deposit Mobilization

Kibebe(2016) the research tried to determine factors that affect deposit mobilization, the associated costs of deposit mobilization in private banks. Therefore, the study adopts mixed approach to gather the data. The primary data is gathered using questionnaire. Sampling method of the primary data is purposive sampling technique. While the secondary sources of data were extracted from annual reports of all private commercial banks of Ethiopia, data from National Bank of Ethiopia (NBE) and from Central Statistical Authority (CSA). Regarding the secondary data, the study used time series data from 2000-2014 for analysis made using Classical linear regression method. The study shows that, Age dependency ratio, Investment and money supply, are the most significant factors of deposit mobilization activity. The other variable such as Per capita income has insignificant power to influence the dependent variable. As a result, the study recommended that, Government should increase investment so as to promote economic growth to mobilize deposits since there exists a positive relationship between Deposit and Investment. And private banks ought to increase number of branches to mobilize more resources.

Shemsu(2015) this study aimed to identify and evaluate those factors affecting bank deposit in general by taking Commercial Bank of Ethiopia as evidence. Accordingly, the researcher adopts mixed research approach. Regarding to the qualitative data; questionnaire is used to gather information from the employees of commercial bank of Ethiopia particularly for those employees 20who actively participated in deposit mobilization tasks in CBE city branches.

Regarding to the secondary data; time series data covering 1998 -2014 was analyzed. First, the time series data were assessed using descriptive statistics for the variables as well as the test for heteroskedasticity, autocorrelation and normality testing to know if the assumptions of CLRM violated or not. Second, estimated model was a single regression equation with deposit as the dependent variable and explanatory variables as deposit interest rate, overall inflation rate, number of branch opening, gross domestic product, individual foreign remittance and dummy variable. Estimation was done using Ordinary Least Squares technique by E-views7 statistical package. The results from economic analysis showed that all the explanatory variables were positively correlated with the explained variable. Among these variables, branch opening is an important strategy for deposit mobilization, it is highly significant than others. Individual remittances from diasporas is also next to branch opening is significantly affects CBE's deposit. The others are affects positively and can increase CBE's deposit. And finally, the study had recommended what should be done to encouraging deposits growth by Commercial bank of Ethiopia for the benefit of the domestic deposit mobilization.

Andinet (2016) the aim of this study is to examine factors influencing deposit mobilization in private commercial banks in Ethiopia. In doing so, the study adopted quantitative methods research approach using secondary data. The study had found variables that can affect the total deposits of 19the banks. Seven variables are regressed with the dependent variable i.e. total deposit. The explanatory variables are number of bank branches, deposit interest rate, liquid asset to deposit ratio, lagged value of bank deposits, net interest margin, inflation rate and economic growth (GDP). The data for these variables were collected from the respective private commercial banks' financial statements, national bank of Ethiopia, central statistical authority and MOFEC of the sample year 2005 up to 2015. Different diagnostic test were performed to know whether the model is valid or not. All the tests were valid and eventually regression analysis was performed using E view statistical package. The result from regression analysis showed that number of bank branches, deposit interest rate, net interest margin and GDP were significantly and positively correlated with the explained variable. Lagged value of bank deposit was significantly and negatively correlated with total deposit. However, liquid asset to deposit ratio and inflation rate were insignificantly negatively correlated with bank deposit. Finally the study had recommended what should be done to mobilize more deposits.

Dereje (2017) the purpose of this study is to investigate determinants of deposit mobilization in private commercial banks of Ethiopia using panel data of six private commercial banks from year 2002 to 2012. The study used both quantitative and qualitative research approach. Secondary financial data are analyzed using multiple linear regressions models for the six bank's deposit. Fixed or random effect regression model was applied to investigate the impact of bank branches, exchange rate, Real Gross domestic product, Capital Adequacy and Liquidity on private commercial banks deposits. Besides, the study used primary data analysis to solicit managers' perception towards the determinants of private commercial banks deposit mobilization. The empirical results from regression analysis showed that bank branches, exchange rate, and real gross domestic product affects deposit of the bank positively whereas, capital adequacy and liquidity affects the deposit of the private banks negatively. This implication show that better capitalized banks tend to create less liquidity that leads to mobilize little deposit amount. On the other hand the feedback of respondents depicted that managerial efficiency, government policy, convenience of bank office, technology, bank size and awareness of savings by society affected deposit level of the banks significantly. Thus, management bodies of private commercial banks should strive to strengthen the identified significant factors and government bodies should also see the adverse effect of tight policies imposed on the existing private commercial banks as well as for the new entrant banks.

Research Gap

Mobilization of deposits is one of the important functions of banking business. It is an important source of working fund for the bank. Deposit mobilization is an indispensable factor to increase the sources of the banks to serve effectively. Mobilization of deposit plays an important role in providing satisfactory service to different sectors of the economy. The success of the banking greatly lies on the deposit mobilization. Performances of the bank depend on deposits, as the deposits are normally considered as a cost effective source of working fund.

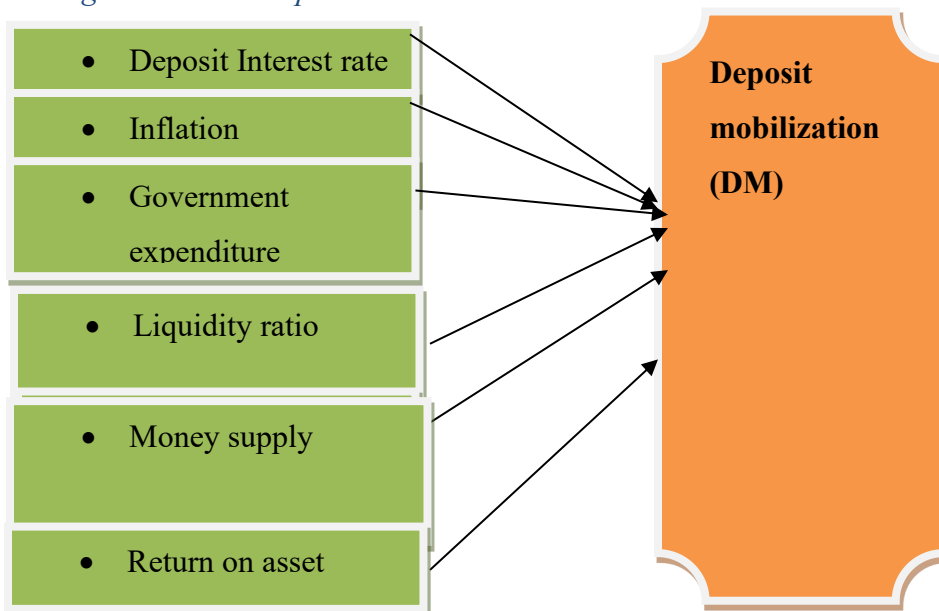
As it was discussed in the literature review part, most of study undertaken in our country related

to the topic of determinants of deposit mobilization focus on the total deposit amount to the private banks and the public banks and some internal and external factors that are reviewed by different researchers indifferent research techniques also showed different effect on Bank deposit. Thus, the inconsistency funding among researchers and little attention given by researcher on the determinate of the overall deposit mobilization of Private commercial banks of Ethiopia, motivated the researcher to undertake a research in this particular area by adding new additional variable to fill these gap. Attention is drawn to private commercial banks because of the increasing number of private banks in the country has significantly contributed to restoring the confidence of depositors in the banking system.

2.6 Conceptual framework

Based on empirical literature on determinants of deposit mobilization of private commercial banks in Ethiopia above the researcher developed conceptual framework as shown below:

Figure 2. 1: Conceptual Framework



Source: researcher own design, 2020

CHAPTER THREE

RESEARCH METHODOLOGY

This chapter describes the research design, the characteristics of the study population, sample and sampling techniques, the source of data, data collection methods, and statistical tools used in the study. It explains the type of data used for the study and the techniques employed in identifying the impact of deposit interest, inflation, government expenditure, liquidity ratio, money supply, and return on asset on private commercial banks deposit mobilization.

3.1 Research Design and approach

The primary objective of this study is determining the factors affecting deposit mobilization of private commercial banks, in Ethiopia. To achieve this objective, this study adopted a causal research design as it focuses on establishing the causal relationships between the dependent variable (deposit mobilization) and the various determining factors as independent variables. In this study, explanatory type of research with a quantitative research approach was employed. By using quantitative research, it is able to explain phenomenon by collecting numerical data, and it allows for statistical comparisons between various groups, hypothesis testing and measure the level of occurrences, action and trends. The explanatory type of research design was used to identify and evaluate the causal relationships between the different determining variables and deposit mobilization.

3.2 Sample size and sampling technique

For this study Ethiopian private commercial banks licensed under Ethiopian National Bank (NBE), and that can provide a ten (10) years data were taken. Using purposive sampling technique, the researcher was take ten private Commercial banks as a sample based on availability of ten years data. The Banks which the researcher used as a sample are Awash Bank S.C, Abyssinia Bank S.C, United Bank S.C, Wegagen Bank S.C, Nib International Bank S.C, Dashen Bank S.C, Cooperative Bank of Oromia S.C, Lion International Bank S.C, Oromia International Bank S.C and Zemen Bank S.C.

3.3 Data sources and collection methods

The necessary data for this study was collected from secondary sources only. The secondary source of data was the audited financial statements of the sample private commercial banks over

a period of ten years (2009-2018). This data was obtained from national bank reports and other materials that are useful for the study.

3.4 Methods of data analysis

The study utilizes panel data regression model which have both cross sectional and time series aspects. The researcher applied quantitative technique of data presentation. It also used tables and percentages. To analyze the collected data, both correlation and multiple panel linear regression data analysis method were employed by using STATA. The correlation analysis was used to identify the relationship between the independent and dependent variables. Multiple panel linear regression analysis was used to test the hypothesis and to explain the relationship between independent and dependent variables

3.5 Specification of empirical research model

To estimate the impact of determining factors on deposit mobilization of private commercial banks, the following general empirical research model was developed:

$$Y_{it} = \beta_0 + \sum \beta_K X_{it} + \varepsilon_{it}$$

Where:

i denote banks ranging from 1 to 10 (cross-sectional dimension).

t denotes years ranging from 2009 to 2018 (time-series dimension).

Y_{it} represents the mean value of dependent variable (DM) deposit mobilization

β_0 is the intercept

β_K represents the coefficients of the X variable

X_{it} represents the explanatory variables (DIrate, INF_n, GOVEx, LIQratio, MSup, and ROA).

ε_{it} is the error term.

The above general empirical research model would be changed in to the study variables to analyze the effect of those internal and external factors on deposit mobilization of private commercial banks as follows:

$$\mathbf{DM} = \beta_0 + \beta_1 (\mathbf{DRate}) + \beta_2 (\mathbf{INFn}) + \beta_3 (\mathbf{GOVEx}) + \beta_4 (\mathbf{LIQratio}) + \beta_5 (\mathbf{MSup}) + \beta_6 (\mathbf{ROA})$$

Dependent variable:

DM = Deposit mobilization

Independent variables:

DRate= Deposit interest rate

INFn= Inflation

GOVEx= Government expenditure

LIQratio= Liquidity ratio

MSup= Money supply

ROA= Return on Asset

3.5.1 Model estimators

Random effect model estimates variance components for groups (or times) and disturbances. It assumes the same intercept and slopes, but varies in error terms across cross sections and times. It is estimated by using generalized least square (GLS), when the variance structure among group is known and examined by the by Breusch and Lagrange multiplier test or LM test. To identify whether to use panel OLS estimator or random effect model estimator LM-test was performed. If the null hypothesis is not rejected at 0.05, significance level the model would use pooled OLS estimator instead of random effect estimator implying that unobserved heterogeneity does not affect error term.

Fixed effect model examines group differences in intercepts and assumes the same slopes and constant variance across entities and subjects. Least square dummy variables (LSDV) and within effect estimation methods were used and it is tested by the (incremental) F-test. Similarly, to identify weather to use pooled OLS model estimator or fixed effect model estimator F-tests was performed using F-statistics. If the null hypothesis of F-test is not rejected at 0.05 significance level the model would use pooled OLS estimator instead of fixed effect model estimator, implying that unobserved heterogeneity does not affect regression intercept. When neither LM-test, nor F-tests, null hypothesis is not rejected, the pooled OLS regression is favored. If the null hypothesis is rejected at both tests the study would use panel data estimator.

To choose between fixed effect and random effect model estimator's additional tests was conducted using Hausman test, if the null hypothesis of the given test is rejected fixed effect model estimator would be appropriate and valid to the given regression otherwise, random effect model estimator was chosen. Panel data used in this research was analyzed using STATA 14.2 software and the result of regression output was properly analyzed.

3.5.2 Specification tests

In the given regression, to check that the assumptions of classical linear regression model (CLRM) are not violated, the following specification tests were performed. First, to examine directional relation between dependent and explanatory variables correlation analysis was done using correlation matrix. Second, to check that the disturbances may not have the same variance but vary across individuals, test of heteroskedasticity was conducted using White's test. Third, test of auto-correlation, which helps to check if the disturbances are related or not with other variables. To check the existence of such problems test for serial correlation was performed using Wooldridge test for auto-correlation in panel data.

Fourth, test of normality was conducted using ShapiroWilk test for normal data. If the null hypothesis is not rejected at 0.05, significance level it reveals the error term is normally distributed otherwise there is the problem of non-normality. Fifth, test of multi-collinearity (substantial correlation among independent variables) was performed using variable inflation factor (VIF). If VIF value is greater than 10 it would reveals the existence of multi-collinearity problem otherwise, not.

3.6 Description of Variables and their measurements

3.6.1 Dependent Variable

To conduct the study *deposit mobilization* is the dependent variable considered and is defined as the public cash or funds accumulation by the banks via its different routes, for instance, savings, current, fixed deposit accounts and other specialized schemes. *Deposit mobilization* is

measured as the annual growth of the total amount of deposit and the data is collected from the audited financial statements of banks.

3.6.2 Independent Variables

In conducting the study, the following independent variables are going to be considered, which are used as a determinant of deposit mobilization of private commercial banks. The definition and measurements of the variables are as follows:

Deposit interest rate: Deposit interest rate is an interest rate paid by the bank to account holders. Real interest rate is nominal interest rate minus inflation rate. Mohammad & Mahdi, (2010) said that in negative real interest rate condition, people withdraw their resources from banking system. Additionally, Mohammad & Mahdi (2010) said that some research supposed that decrease in real interest rate could decrease true demands for money (in its extensive definition including savings and time deposits). Therefore, it stated that the nominal interest rate and deposit of the banks have positive relationship. The deposit interest rate is measured as the annual interest rate on customer deposit and the data is collected from the audited financial statements of banks.

Inflation: Inflation is a general increase in prices and fall in the purchasing value of money. Consumer price index (CPI) puts together the sum total price of portfolio of consumer goods and services consumed by the household to evaluate the changes there from. The CPI is seen as a statistically measurement arrived at adopting the different prices of a sample of representative items whose prices are collected on monthly, quarterly, bi-annually and annually. It can be used for inflation adjustment to arrive at indices for Salaries, Pension, and Real Wages and to adjust monetary magnitude and demonstrate changes in real economic value (Akaninyene et al., 2018).

According to the study conducted by Innocent & Aniekpeni, (2018), Inflation also favor's the borrower and harms lender. I.e. since inflation leads to the fall in the value of money, a borrower at the time of payment of his debt will be paying back an amount whose value has fallen. Inflation may also retard the economic growth because of the redistribution effect, discourages domestic savings and contribute to capital flight from foreign investors. It is on the basis of the above problems that inflation is to be taken as a determining factor on the deposit mobilization of

the private commercial banks in Ethiopia. Inflation is measured as the annual change in general inflation and the data is collected from the annual reports of National Bank of Ethiopia.

Government expenditure: Government expenditure includes all government consumption, investment and transfer payments to create future benefits. All monetary expenditure on goods and services made by the government on behalf of the community is named as capital expenditure. It includes both recurrent and capital expenditure on items like health, education, administration and so on. The recurrent expenditure refers to the expenditures that occur at regular intervals in the annual budget of the government. These expenses include expenditure on defense, administration and debt servicing particularly payment of interest on loans, road maintenance, and cost of health and education services. Thus, if Government expenditure increases, it will create additional job opportunities that lead to enhance the income of the nation and increase deposit mobilization of the society (Ketema, 2017). Government expenditure is measured as the annual growth of total amount of the government current and capital expenditure and the data is collected from the annual reports of National Bank of Ethiopia.

Liquidity ratio: Liquidity ratio is the ratio between the liquid assets and the liabilities of a bank or other institutions. Liquidity ratios measure a firm's ability to meet its maturing financial obligations. The focus is on short-term solvency as if the firm were liquidated today at book value.

The most common financial ratios that reflect the liquidity position of a bank are customer deposit to total asset, total loan to customer deposits and cash to deposit ratio (Ongore and Kusa, 2013).

The current ratio (CR) is the most common liquidity measure and provides an indication of a firm's ability to pay short-term claims with short-term assets. Liquidity ratio measures the liquidity of a bank assuming that the bank cannot borrow from other banks in case of liquidity need. This is relatively strict measure of liquidity but it enables the researcher to capture at least the part of the market liquidity risk. This ascertains whether the bank's short-term assets are readily available to pay off its short-term liabilities. The bank is able to meet its obligations in terms of funding (the volume of liquid assets is high enough to cover volatile funding) if the value of this ratio is 100% or more (Vodova, 2013).

For the purpose of this research, the liquid assets include cash on hand (local and foreign), deposits with the National Bank Ethiopia and other local and foreign banks having acceptance by the National Bank and treasury bills. Liquidity ratio is measured for each bank as the ratio of liquid asset to total deposit and the data is collected from the audited financial statements of banks.

Money supply: Money supply is the total amount of money in circulation or in existence in a country. Money supply is one of the tools used by the government in the conduct of its monetary policy. Hence, any changes in money supply can have a major impact on economic conditions. An increase in money supply makes loan-able funds cheaper, thus reducing cost of borrowing for corporate and individual customers (Ketema, 2017). In this case, it is predictable that people will increase consumption and reduce savings and thus money supply will have an inverse relationship with deposits. On the other hand, it could also be argued as well that as more money is supplied to the economy, more deposits could put in banks accumulating the fund for transaction and investment purposes. Money supply is measured as the growth of broad money supply and the data is collected from the annual reports of National Bank of Ethiopia

Return on Asset (ROA): Measures the overall efficiency of management of banks and shows how the management is efficient in using its assets to generate earnings. It is measured for each bank as the ratio of net profit after tax to total asset and the data is collected from the audited financial statements of banks.

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION

This chapter presents the descriptive statistics, correlation analysis and regression analysis of the study variables. It has three sections. The first section is the descriptive statistics which summarizes the main features of the study variable such as mean, maximum, minimum and standard deviation. The second section is the correlation analysis which shows the degree of association between the study variables. The third sections of the chapter, includes regression results report output of the regression model.

4.1 Descriptive Statistics of Variables

This section presents the descriptive statistics of dependent and independent variables used in the study for the sample private commercial banks. The dependent variable used in the study was bank deposit growth (DEPG). The independent variables were Interest rate (INTRATE), government expenditure (GOEXP), money supply (MOSU), inflation (INFLN), liquidity ratio (LR) and return on asset (ROA). The mean values are used to reveal the average for all variables used in this study and standard deviation has been used to analyze the variations in explanatory variables.

Table 4.1 demonstrates the mean, standard deviation, minimum and maximum values for the dependent and independent variables for sample private commercial banks over the year 2009 to 2018.

Table 4. 1: Descriptive Statistics of the study variables

Variable	Obs	Mean	Std. Dev.	Min	Max
DEPG	100	.3926	.2776239	-.03	1.46
INTRATE	100	.05	.007785	.04	.07
GOEXP	100	.225	.0628048	.08	.32
MOSU	100	.271	.0525991	.2	.39
INFLN	100	.138	.0909878	.03	.36
LR	100	.429042	.1659806	.12	.94
ROA	100	.0270892	.0082098	.0023	.052

As shown in the table 4.1. The average value of deposit growth (DEPG) for sampled private commercial banks is 39.26 percent (mean= 0.3926) with a maximum and minimum of 146 percent and -3 percent respectively. The standard deviation result of 27.76 percent indicates that banks deposit for the sample private commercial banks varies by 27.76 percent from the average value of 39.26 percent. This confirms that there were high variations of deposit growth among private commercial banks during the study period. Though the performances of deposit growth among private commercial banks conform to supply the loan able fund, the trend of deposit is increasing year to year at increasing rate. On average private commercial banks achieved 39.26 percent deposit growth from depositors for the period of 2009-2018.

Regarding the explanatory variables, the average annual interest rate (INTRATE) of the country over the period under the study is 5 percent (mean =0.05). Since annual interest rate was measured by annual interest rate of the country on customer deposit, the maximum attained average interest rate is 7 percent whereas the lowest recorded average interest rate is 4 percent, with the standard deviation of 0.7 percent.

As it can be seen in the table above that the average growth rate of government expenditure (GOEXP) is 22.5 percent (mean =0.225) with minimum growth rate 8 percent and the maximum growth rate of 32 percent. The result indicates that the government expenditure increases from year to year with an increasing rate. The dispersion of the government expenditure growth is 6.28 percent which is moderate. The increase of the government expenditure is related to the increase of the budget and the increase of capital expenditure for different big government projects.

The mean growth rate of broad money supply by the government (MOSU) is 27.1 percent (mean =0.271), the maximum and the minimum growth rate of broad money supply is 39 percent and 2 percent respectively. The growth rate of dispersion is 5.25 percent which is moderate.

The average general inflation (INFLN) of the country over the sample period is 13.8 percent (mean = 0.138). Since annual inflation rate was measured by percentage change in the general inflation of the country, the maximum attained average inflation rate is 36 percent whereas the lowest recorded average inflation rate is 3 percent. The rate of inflation dispersed which exhibits higher dispersion larger than its average value over the periods under study towards its mean

with standard deviation of 9.09%. This clearly shows that there was a bit more variations in terms of cost of living as it measured by inflation consumer price index.

The average liquidity ratio (LR) of the studied private commercial banks is 42.90 percent (mean = .429042). Since the liquidity ratio was measured by liquid asset divided by total deposit, the maximum attained average liquidity ratio is 94 percent whereas the lowest recorded average liquidity ratio was 12 percent. The standard deviation was 16.59% percent. This indicates that, on average the private commercial banks in Ethiopia have moderate amount of volatile deposits which are tied up with illiquid loans.

Return on asset (ROA) is measured by the net income divided by total asset. The table noted that return on asset has a mean value of 2.71 percent (mean = .0270892). This indicates that the sample private commercial banks earned on average a net income of 2.71 percent of the total asset during the study period. Since return on asset indicates the efficiency of the management of a company in generating net income from all the resources of the institutions, the higher ROA shows that the company is more efficient in utilizing its resources. The maximum value of ROA was 5.2 percent and minimum value of 0.23 percent. The standard deviation is 0.08 percent from the average value 2.71. The standard deviation of 0.08 percent suggests that there is not wide dispersion in the return on asset of the sampled private commercial banks in Ethiopia.

4.2 Correlation analysis

This section of the study presents the results and discussions of the correlation analysis. To identify the relationship among the independent variables (Interest rate (INTRATE), government expenditure (GOEXP), money supply (MOSU), inflation (INFLN), liquidity ratio (LR) and return on asset (ROA)). And the dependent variable (bank deposit growth) correlation coefficients were used.

Below in table 4.2, the correlation matrix which shows the relationship of the deposit growth with Interest rate (INTRATE), government expenditure (GOEXP), money supply (MOSU), inflation (INFLN), liquidity ratio (LR) and return on asset (ROA).

Based on the correlation matrix the independent variables; Interest Rate (INTRATE), Inflation (INFLN) and return on asset (ROA) are negative correlated with deposit growth. However, Liquidity ratio (LR), Government Expenditure (GOEXP) and money supply (MOSU) are positively correlated with deposit growth.

The correlation analysis shows only the direction and degree of association between variables and it does not allow the researcher to make causal inferences regarding the relationship between the identified variables. As a result, the main analysis is left for regression analysis that overcomes the shortcoming of correlation analysis.

Table 4. 2: Correlation Matrix of Deposit growth and explanatory variables

Correlate	DEPG	INTRA TE	GOEXP	MOSU	INFLN	LR	ROA
DEPG	1.0000						
INTRATE	-0.1622	1.0000					
GOEXP	0.0446	-0.6198	1.0000				
MOSU	0.0870	0.2713	0.2981	1.0000			
INFLN	-0.1375	-0.1569	0.2669	-0.0144	1.0000		
LR	0.4913	-0.4695	0.3186	0.0375	0.3255	1.0000	
ROA	-0.1042	-0.0197	0.1802	0.1817	-0.0440	0.1532	1.0000

4.3 Regression results and diagnostics

This section of the study presents the regression results of the effects of independent variables on deposit growth (DEPG) of sample private commercial banks. To enhance the quality of the econometric estimates, model diagnosis tests are made followed by presentation of regression results on the effects of independent variables on deposit growth (DEPG) of sample private

commercial banks. The regression analysis enables the researcher to empirically test the proposed hypothesis and to achieve the research objective.

4.3.1 Model diagnostics

Random effect model estimates variance components for groups (or times) and disturbances. It assumes the same intercept and slopes, but varies in error terms across cross sections and times. It is estimated by using generalized least square (GLS), when the variance structure among group is known and examined by the by Breusch and Lagrange multiplier test or LM test. To identify whether to use pooled OLS estimator or random effect model estimator LM-test test was performed, if the null hypothesis is not rejected at 0.05, significance level the model would use pooled OLS estimator instead of random effect estimator implying that unobserved heterogeneity does not affect error term. The test result of the given research data, LM -test result reveals that the null hypothesis is not rejected at 0.05, significance level; or (Prob > chibar2 = 1.0000).

Fixed effect model examines group differences in intercepts and assumes the same slopes and constant variance across entities and subjects. Least square dummy variables (LSDV) and within effect estimation methods are used and it is tested by the (incremental) F-test. Similarly, to identify weather to use pooled OLS model estimator or fixed effect model estimator F-tests was performed using F-statistics, if the null hypothesis of F-test is not rejected at 0.05 significance level the model would use pooled OLS estimator instead of fixed effect model estimator, implying that unobserved heterogeneity does not affect regression intercept. The test result of the given research data, F -test result reveals that the null hypothesis is not rejected at 0.05, significance level; or (Prob > F = 0.4025). When neither LM-test nor F-tests, null hypothesis is rejected the pooled OLS regression is preferred. If the null hypothesis is rejected the study would use panel data estimator. In addition to this, the above results of the two tests reveals no need to conduct further tests to identify weather to use fixed or random effect model estimators using (Hauseman test). Indeed, this research paper used pooled OLS model estimator in the entire regression analysis which assumes the same intercept and constant slopes across entities.

4.3.1.1 Heteroskedasticity test

Heteroskedasticity is a systematic pattern in the errors where the variances of the errors are not constant (Gujarati 2003). If the residuals have the same variance from one observation to another observation, it is called homoskedasticity. Therefore, the White's test for heteroskedasticity is was used. As indicated in tables of 4.3, to test the existence of heteroskedasticity problem in the regression model, the null hypothesis explained as there is homoskedasticity (the error terms have constant variances) and the alternative hypothesis is if not. The result of the test does not permit the researcher to reject the null hypothesis at 0.05, significance level or (Prob> chi2=0.0917. Therefore, heteroskedasticity problem does not exist on a given research data.

White's test for Ho: homoskedasticity

Against Ha: unrestricted heteroskedasticity

chi2 (30) = 34.81

Prob > chi2 = 0.0917

Table 4. 3: Heteroskedasticity test for sample private commercial banks deposit growth

Source	chi2	df	p
Heteroskedasticity	34.81	25	0.0917
Skewness	24.77	6	0.0004
Kurtosis	0.70	1	0.4030
Total	60.28	32	0.0018

4.3.1.2 Test of Autocorrelation

To test serial autocorrelation on the given research data Wooldridge test for autocorrelation in panel data test was used. The null hypothesis states that error term is not serially correlated and alternative hypothesis also states as error term is serially correlated. The result of the test reveals that the null hypothesis is not rejected at 0.05 significance level or (Prob > F = 0.3318). Therefore, autocorrelation problem does not exist on a given research data.

Table 4. 4: Autocorrelation test for sample private commercial banks deposit growth

Wooldridge test for autocorrelation in panel data	
H0: no first-order autocorrelation	
F(1, 9) =	1.052
Prob > F =	0.3318

4.3.1.3 Normality test

The main statistical tests for normality which are available in most of the statistical programs are Shapiro-Wilk test (Hair et al., 2006). A significant result (P-value of less than 0.05) indicates that the distribution violates the assumption of normality which is common in large samples (Pallant 2005). The null hypothesis of the test shows normal distribution when the result of the test is not significant (at P-value of more than 0.05) and the alternative hypothesis otherwise. The test result shows the null hypothesis of the error term is normally distributed would not be rejected, because the p-value of the test is greater than 5% significance level or (**Prob>Z = 0.09940**). Therefore, there is no normality problem on the data used for this study.

Shapiro-Wilk W test for normal data

Table 4. 5: Normality test for sample private commercial banks deposit growth`

Variable	Obs	W	V	z	Prob>z
e	100	0.97838	1.785	1.285	0.09940

4.3.1.4 Test of multicollinearity

Multicollinearity exists if the correlation between two independent variables is more than 0.9 ($r=0.9$ or above) (Gujarati 2003). In order to examine the possible degree of multicollinearity among the explanatory variables, Variance Inflation Factor (VIF) technique is employed. It measures the increasing in the variance of a coefficient as result of collinearity. The advantage of

VIF is that, it helps to identify the variable causing the problem. As we can see from table, 4.6 below the overall VIF result is 2.03 which is less than 10. Therefore, this test is acceptable and prove that there is no multicollinearity problem from the given research data or it suggests that there is no perfect or strong collinearity between the explanatory (Independent) variables.

Table 4. 6: Test of Multicollinearity

Variable	VIF	1/VIF
INTRATE	3.34	0.299346
GOEXP	3.01	0.332743
MOSU	1.92	0.521700
LR	1.56	0.639835
INFLN	1.26	0.795910
ROA	1.10	0.907861
Mean VIF	2.03	

All the above tests of basic classical linear regression model assumptions prove that the results obtained from the regression models in this study are consistent, free from bias and efficient since all the assumptions hold and the next section presents the analysis and discussion of the outputs of the regression.

4.3.2 Results of regression analysis for sample private commercial banks deposit growth

The multiple regression results of the econometric model used in the study are presented in table 4.7; the regression output was run by taking deposit growth (DEPG) as a dependent variable and other variables (Interest rate (INTRATE), government expenditure (GOEXP), money supply (MOSU), inflation (INFLN), liquidity ratio (LR) and return on asset (ROA) as independent variables. From the table R-squared statistics and the Adjusted-R squared statistics of the model were 40% and 36.13% respectively. This shows that 40% variability of the dependent variable is explained by the movement of explanatory variables included in the model. In other word 40% variability of bank deposit growth of sample private banks were attributed to the change in explanatory variables. The remaining 60% of changes was explained by other factors which are not included in the model. The adjusted R² measures how well the model fits the data by taking into account the loss of degrees of freedom associated with adding extra variables. Therefore, the model best fits the data.

From the regression analysis Constant = **1.55** shows that if all the independent variables are rated as zero, the deposit growth of sample private banks would rate at 1.55. The level of confidence for the analysis was set at 95%. Therefore, the P- value less than 0.05 imply that the independent variables are significant otherwise not.

The dependent variables explained here for this study is deposit growth (DEPG). As indicated in table 4.7 below, inflation(INFLN), liquidity ratio (LR), and return on asset(ROA) are found to be significant regressors of deposit growth (DEPG) of sample private commercial banks. However, government expenditure (GOEXP), money supply (MOSU) and deposit interest rate (INTRATE) are statistically insignificant with the deposit growth (DEPG) of sample private commercial banks.

Table 4. 7: Tables of regression result

Source	SS	df	MS	Number of obs = 100
				F(10, 99) = 10.33
Model	3.05246572	6	.508744287	Prob> F = 0.0000
Residual	4.57796428	93	.049225422	R-squared = 0.4000
Total	7.63043	99	.077075051	Adj R-squared = 0.3613
				Root MSE = .22187

DEPG	Coef.	Std. Err.	t	P> t 	[95% Conf. Interval]
INTRATE	1.553912	5.235191	0.30	0.767	-8.842141 11.94996
GOEXP	-.1584969	.6155026	-0.26	0.797	-1.380763 1.063769
MOSU	.5175479	.5869326	0.88	0.380	-.6479838 1.68308
INFLN	-1.059773	.274702	-3.86	0.000	-1.605276 -.5142689
LR	1.117496	.1679522	6.65	0.000	.7839767 1.451016
ROA	-7.857562	2.850574	-2.76	0.007	-13.51824 -2.196886
_cons	.0899615	.3121503	0.29	0.774	-.5299072 .7098301

4.3.3 Discussion of regression results and hypothesis testing

4.3.3.1 Deposit Interest rate and deposit mobilization

Interest Rate (INTRATE) which is measured by the annual interest rate on customer deposit. It was hypothesized that Interest rate has a positive and significant impact on private commercial bank's deposit growth. The regression result shows that interest rate has a positive and insignificant relation with deposit growth of private commercial banks, with a coefficient and probability of the interest rate of (1.553912) and (0.767) respectively. Even though hypothesis 1 predicts that, deposit interest is positively associated with deposit growth of private commercial bank, the insignificant probability of the interest rate does not support this hypothesis.

The result supports the argument of Wubitu, (2012) and Mohammad & Mahdi, (2010) which states that there is a positive and statistically insignificant relationship between deposit interest rate and deposit volume at Banks. The regression result for the relationship between Interest Rate (INTRATE) and sample private commercial bank's deposit growth is inconclusive since it was found statistically insignificant.

4.3.3.2 Government Expenditure and deposit mobilization

The other explanatory variable considered in this study was government expenditure (GOEXP) which is measured by the growth of total amount of the current and capital expenditure. It was hypothesized that government Expenditure has positive and significant impact on private commercial bank's deposit growth. But according to the regression result of this study, Government Expenditure has negative and statistically insignificant impact on deposit growth of private commercial banks, since the coefficient and probability of government expenditure are (-.1584969) and (0.797) respectively. The major reason behind negative relationships between government expenditure and private commercial bank's deposit growth is one of the depositor of commercial banks are government organization so this organization will withdraw their deposit if their expenditure will increases and the private commercial banks will be influenced by holding higher amount of money to meet the request of the customer withdrawal.

4.3.3.3 Money supply and deposit mobilization

Money Supply is measured by the annual percentage change in Broad Money Supply. It was hypothesized that money supply has positive and significant impact on private commercial bank's deposit growth. According to the regression result of this study, Money Supply has positive and statistically insignificant impact on deposit growth of commercial banks, since the coefficient and probability of money supply are (0.5175479) and (0.380) respectively. Even though hypothesis 6 predicts that, money supply is positively associated with deposit growth of private commercial banks; the insignificant coefficient of the money supply does not support this hypothesis.

4.3.3.4 Inflation and deposit mobilization

Inflation (INFLN) is measured by the annual change in general inflation. It was hypothesized that inflation has negative and significant impact on private commercial bank's deposit growth. The regression result also shows that inflation has a negative and statically significant impact on private commercial bank's deposit growth, since the coefficient and probability of inflation (INFLN) are (-1.059773) and (0.000) respectively. This means that when inflation decreased by 1 percent, deposit growth of sampled private commercial banks would increase by 1.06 percent. And the relationship is statistically significant which below 5% significance level. So, higher inflation induces savers to save less. The negative relation was consistent with the findings of (Choi, Smith & Boyd, 1996) which states that higher inflation has a negative relationship with deposit growth.

4.3.3.5 Liquidity and deposit mobilization

In this study, liquidity ratio (LR) is measured by total liquid asset to total deposit. It was hypothesized that liquidity ratio has positive and significant impact on private commercial bank's deposit growth. The regression result also shows that liquidity ratio has positive and statistically significant impact on private commercial bank's deposit growth, since the coefficient and probability of liquidity ratio are (1.117496) and 0.000 respectively. According to the regression result, a one-birr change in the Bank's liquidity, keeping other things constant, has resulted in 1.12-birr change on the level of deposit of private commercial banks deposit growth. In other word, it means that the depositors are concerned with liquidity position which determines a bank's ability to respond to the withdrawal needs, which are normally on demand.

This significant impact relation of liquidity and deposit growth is consistent with the funding of Herald & Heiko, (2009) who argued that the liquidity situation of the bank also plays a significant role in determining banks deposit growth. Banks with a higher loan exposure are associated with higher deposit growth.

4.3.3.6 Return on asset and deposit mobilization

Return on asset is measured by net income divided by total asset. It was hypothesized return on asset has negative and insignificant impact on private commercial bank's deposit growth. The regression result shows that return on asset has negative and statistically significant impact on private commercial bank's deposit growth, since the coefficient and probability of return on asset are (-7.857562) and (0.007) respectively. The result implies that return on asset is negatively related with the deposit growth of private commercial banks. In other words, the higher the return of asset the lower their deposit growth. This significant impact relation of private Commercial Bank Deposit and return on asset is consistent with the funding of Haron & Azmi, (2006).

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

The previous chapter presented the analysis of the findings, while this chapter deals with the conclusions and recommendations provided based on the findings of the study. In this chapter, the conclusion of the study was made followed by recommendations.

5.1 Conclusions

The study revealed that the main resource of fund for private commercial banks is deposit, so the bank should give due emphasis to its deposit and strive to increase it. The main objective of the study was to identify determinants of private commercial banks deposit mobilization in Ethiopia. In this study, deposit interest rate (INTRATE), government expenditure (GOEXP), money supply (MOSU), inflation (INFLN), liquidity ratio (LR) and return on asset (ROA) are used as explanatory variables. In achieving this aim, the researcher selected ten (10) Ethiopian private commercial banks with a data set covering ten (10) years period from the year 2009 to 2018. Based on the results of the descriptive statistics, correlation and regression analysis the researcher made the following conclusions.

Finding on descriptive statistics indicate that the mean value of private commercial banks deposit growth is 39.26 percent which measured by annual growth of deposit amount. This implies that on average private commercial banks achieved 39.26 percent deposit growth from depositors for the period of 2009-2018. Whereas, the independent variables: - interest rate, government expenditure, money supply, inflation, liquidity ratio and return on asset have a mean value of 5 percent, 22.5 percent, 27.1 percent, 13.8 percent, 42.9 percent and 2.7 percent respectively.

The correlation analysis of the study revealed that independent variables; Interest Rate (INTRATE), Inflation (INFLN) and return on asset (ROA) are negatively correlated with deposit growth. However, Government Expenditure (GOEXP) Liquidity ratio (LR) and money supply (MOSU) have positive correlation with deposit growth.

According to the regression result of this study, Government Expenditure has negative and statistically insignificant impact on deposit growth of sample private commercial banks. This indicates that government is one of the main depositor of private commercial banks so when

governments' expenditure increase, the deposit amount of the private commercial bank by government would be decrease.

Based on the regression result, the researcher concludes that, inflation has significant and negative influences on the deposit growth of sample private commercial banks. This implies that when inflation rate increase; purchasing power of the money would be decrease and a huge amount of money is required to consume or to do a business which leads to decrease the deposit growth of private commercial banks.

In connection with liquidity, the study indicated that the banks liquidity has positive and statistically significant effect on private commercial banks deposit growth. This implies that deposit growth increase when the bank liquidity is increases.

The regression result shows that return on asset has negative and statistically significant impact on private commercial bank's deposit growth. The result implies that the higher the return of asset the lower their deposit growth.

The regression result of the study revealed that interest rate and money supply have insignificant relation with private commercial banks deposit growth. Based on the finding the researcher concludes that, even though hypothesis 1 and 5 predicts that, interest rate and money supply are positively associated with private commercial banks deposit growth, the insignificant coefficient of the interest and money supply have not support the hypotheses.

5.2 Recommendations

The findings of the study are believed to benefit private commercial banks, policy makers, regulators (National bank of Ethiopia) and academicians. The recommendations are given based on the regression result output; three independent variables (inflation, liquidity and return on asset) are found to be significant regressor of deposit growth of sample private commercial banks. Therefore, based on the major findings as discussed above, the researcher drawn the following recommendations to participants which have vital role on issues related to deposit mobilization.

From the regression result, the researcher found that liquidity is positively and statistically significantly affects the deposit growth of private commercial banks in Ethiopia. Therefore, to increase the liquidity ratio (liquid asset divided to total deposit), the researcher recommended that, the liquidity management team of the bank should manage and supervise amount of asset which should be held as liquid assets so as to enhance deposit mobilization of private commercial banks.

According to the regression result of this study, Inflation has negative and statistically significant impact on deposit growth of private commercial banks. Therefore, to enhance deposit mobilization of private banks, the researcher suggests that banks should adjust their interest rate as an incentive that motivates depositors to increase their saving amount with the bank.

Similar to Inflation, finding of this research shows that, return on asset has negative and statistically significant impact on deposit growth of private commercial banks. As a result, the researcher recommended that, having efficient utilization of a resource is important, but the banks management team should give more emphasis on strategies which enhance deposit mobilization of the bank rather than more depend on return on asset.

5.3. Recommendation for future Research

The study considered the determinants of deposit mobilization of private banks in Ethiopia. The results of this study should provide a suitable basis for further research in order to arrive at a generalized acceptable practice on deposit mobilization. However, there may be other variables not included in the statistical analysis that could possibly affect the deposit growth of private commercial banks. Thus, the researcher recommends for future researchers to conduct study by including more variables focusing on customer satisfaction and quality of managerial staffs.

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Appendices

Appendix 1: Research data

Bank	Years	DEPG	INTRATE	GOEXP	MOSU	INFLN	LR	ROA
1	2009	0.1900	0.0400	0.2300	0.2100	0.3600	0.5934	0.0257
1	2010	0.2800	0.0400	0.2300	0.2600	0.0300	0.5080	0.0262
1	2011	0.5000	0.0500	0.3100	0.3900	0.1800	0.2558	0.0307
1	2012	0.1900	0.0500	0.3200	0.3000	0.2400	0.4495	0.0272
1	2013	0.1200	0.0500	0.2400	0.2400	0.1400	0.3424	0.0307
1	2014	0.9200	0.0500	0.2100	0.2700	0.0800	0.3700	0.0324
1	2015	0.2200	0.0500	0.2400	0.2500	0.0800	0.4791	0.0294
1	2016	0.2500	0.0500	0.2000	0.2000	0.0900	0.3100	0.0254
1	2017	0.2200	0.0500	0.2100	0.2900	0.0700	0.3891	0.0118
1	2018	0.5000	0.0700	0.0800	0.2900	0.1300	0.2957	0.0105
2	2009	0.2110	0.0400	0.2300	0.2100	0.3600	0.5200	0.0223
2	2010	0.2300	0.0400	0.2300	0.2600	0.0300	0.4620	0.0312
2	2011	0.2500	0.0500	0.3100	0.3900	0.1800	0.5500	0.0357
2	2012	0.1900	0.0500	0.1200	0.3000	0.2400	0.3430	0.0230
2	2013	0.3000	0.0500	0.2400	0.2400	0.1400	0.2850	0.0342
2	2014	0.5000	0.0500	0.2100	0.2700	0.0800	0.7360	0.0309
2	2015	0.2300	0.0500	0.2400	0.2500	0.0800	0.3277	0.0270
2	2016	0.2300	0.0500	0.2000	0.2000	0.0900	0.3510	0.0251
2	2017	0.3400	0.0500	0.2100	0.2900	0.0700	0.3690	0.0239
2	2018	0.2200	0.0700	0.0800	0.2900	0.1300	0.2680	0.0270
3	2009	0.2500	0.0400	0.2300	0.2100	0.3600	0.3600	0.0183
3	2010	0.9800	0.0400	0.2300	0.2600	0.0300	0.5060	0.0224

3	2011	0.3800	0.0500	0.3100	0.3900	0.1800	0.4070	0.0249
3	2012	0.3100	0.0500	0.3200	0.3000	0.2400	0.4173	0.0263
3	2013	0.2500	0.0500	0.2400	0.2400	0.1400	0.2320	0.0214
3	2014	0.0200	0.0500	0.2100	0.2700	0.0800	0.3020	0.0397
3	2015	0.2200	0.0500	0.2400	0.2500	0.0800	0.5640	0.0213
3	2016	0.5200	0.0500	0.2000	0.2000	0.0900	0.1280	0.0214
3	2017	0.5100	0.0500	0.2100	0.2900	0.0700	0.2960	0.0225
3	2018	0.2400	0.0700	0.0800	0.2900	0.1300	0.5740	0.0176
4	2009	0.4200	0.0400	0.2300	0.2100	0.1600	0.4590	0.0023
4	2010	0.9500	0.0400	0.2300	0.2600	0.0300	0.6210	0.0142
4	2011	0.9500	0.0500	0.3100	0.3900	0.1800	0.6100	0.0189
4	2012	0.3100	0.0500	0.3200	0.3000	0.2400	0.4400	0.0278
4	2013	0.5900	0.0500	0.2400	0.2400	0.1400	0.3600	0.0313
4	2014	0.0200	0.0500	0.2100	0.2700	0.0800	0.3400	0.0267
4	2015	0.3500	0.0500	0.2400	0.2500	0.0800	0.4300	0.0273
4	2016	0.2400	0.0500	0.2000	0.2000	0.0900	0.2550	0.0233
4	2017	0.5900	0.0500	0.2100	0.2900	0.0700	0.4400	0.0145
4	2018	0.4800	0.0700	0.0800	0.2900	0.1300	0.3100	0.0147
5	2009	0.7500	0.0400	0.2300	0.2100	0.3600	0.9400	0.0297
5	2010	1.4600	0.0400	0.2300	0.2600	0.0300	0.7600	0.0172
5	2011	1.0000	0.0500	0.3100	0.3900	0.1800	0.5570	0.0227
5	2012	0.3800	0.0500	0.3200	0.3000	0.2400	0.4300	0.0178
5	2013	0.4700	0.0500	0.2400	0.2400	0.1400	0.3940	0.0271
5	2014	0.5400	0.0500	0.2100	0.2700	0.0800	0.3730	0.0250
5	2015	0.7500	0.0500	0.2400	0.2500	0.0800	0.4700	0.0226

5	2016	0.2800	0.0500	0.2000	0.2000	0.0900	0.5300	0.0197
5	2017	0.4300	0.0500	0.2100	0.2900	0.0700	0.2470	0.0277
5	2018	0.5000	0.0700	0.0800	0.2900	0.1300	0.2920	0.0306
6	2009	0.5200	0.0400	0.2300	0.2100	0.3600	0.6292	0.0127
6	2010	0.4400	0.0400	0.2300	0.2600	0.0300	0.6277	0.0293
6	2011	0.2000	0.0500	0.3100	0.3900	0.1800	0.3000	0.0242
6	2012	0.9300	0.0500	0.3200	0.3000	0.2400	0.6000	0.0260
6	2013	0.3500	0.0500	0.2400	0.2400	0.1400	0.4700	0.0379
6	2014	0.5700	0.0500	0.2100	0.2700	0.0800	0.4200	0.0267
6	2015	0.6500	0.0500	0.2400	0.2500	0.0800	0.4400	0.0257
6	2016	0.7200	0.0500	0.2000	0.2000	0.0900	0.4895	0.0242
6	2017	0.3900	0.0500	0.2100	0.2900	0.0700	0.3744	0.0245
6	2018	0.3200	0.0700	0.0800	0.2900	0.1300	0.2594	0.0273
7	2009	0.5200	0.0400	0.2300	0.2100	0.3600	0.7970	0.0198
7	2010	1.4500	0.0400	0.2300	0.2600	0.0300	0.8880	0.0483
7	2011	0.6800	0.0500	0.3100	0.3900	0.1800	0.7080	0.0325
7	2012	0.5400	0.0500	0.3200	0.3000	0.2400	0.5020	0.0361
7	2013	0.7400	0.0500	0.2400	0.2400	0.1400	0.4580	0.0290
7	2014	0.2100	0.0500	0.2100	0.2700	0.0800	0.4930	0.0469
7	2015	0.2600	0.0500	0.2400	0.2500	0.0800	0.3020	0.0314
7	2016	0.4300	0.0500	0.2000	0.2000	0.0900	0.4020	0.0275
7	2017	0.3300	0.0500	0.2100	0.3900	0.0700	0.4540	0.0368
7	2018	0.3900	0.0700	0.0800	0.2900	0.1300	0.3600	0.0218
8	2009	0.2900	0.0400	0.2300	0.2100	0.3600	0.6870	0.0201
8	2010	0.3000	0.0400	0.2300	0.2600	0.0300	0.4930	0.0296

8	2011	0.0280	0.0500	0.3100	0.3900	0.1800	0.4500	0.0300
8	2012	0.0010	0.0500	0.3200	0.3000	0.2400	0.4200	0.0339
8	2013	0.2000	0.0500	0.2400	0.2400	0.1400	0.2600	0.0214
8	2014	0.0800	0.0500	0.2100	0.2700	0.0800	0.2380	0.0367
8	2015	0.3200	0.0500	0.2400	0.2500	0.0800	0.2300	0.0196
8	2016	0.1000	0.0500	0.2000	0.2000	0.0900	0.1200	0.0196
8	2017	0.2600	0.0500	0.2100	0.2900	0.0700	0.1490	0.0174
8	2018	0.4000	0.0700	0.0800	0.2900	0.1300	0.2400	0.0205
9	2009	0.3600	0.0400	0.2300	0.2100	0.3600	0.7820	0.0353
9	2010	0.8500	0.0400	0.2300	0.2600	0.0300	0.7740	0.0389
9	2011	0.5200	0.0500	0.3100	0.3900	0.1800	0.6950	0.0401
9	2012	-0.0300	0.0500	0.3200	0.3000	0.2400	0.4850	0.0403
9	2013	0.3100	0.0500	0.2400	0.2400	0.1400	0.4800	0.0330
9	2014	0.3100	0.0500	0.2100	0.2700	0.0800	0.2130	0.0271
9	2015	0.0800	0.0500	0.2400	0.2500	0.0800	0.2480	0.0257
9	2016	0.0200	0.0500	0.2000	0.2000	0.0900	0.2800	0.0232
9	2017	0.2700	0.0500	0.2100	0.2900	0.0700	0.2790	0.0254
9	2018	0.3600	0.0700	0.0800	0.2900	0.1300	0.3970	0.0490
10	2009	0.2300	0.0400	0.2300	0.2100	0.3600	0.5080	0.0320
10	2010	0.2500	0.0400	0.2300	0.2600	0.0300	0.4430	0.0336
10	2011	0.2500	0.0500	0.3100	0.3900	0.1800	0.5100	0.0347
10	2012	0.1300	0.0500	0.3200	0.3000	0.2400	0.5100	0.0346
10	2013	0.0400	0.0500	0.2400	0.2400	0.1400	0.3400	0.0520
10	2014	0.1900	0.0500	0.2100	0.2700	0.0800	0.2400	0.0277
10	2015	0.2300	0.0500	0.2400	0.2500	0.0800	0.4800	0.0254

10	2016	0.2700	0.0500	0.2000	0.2000	0.0900	0.2400	0.0246
10	2017	0.4500	0.0500	0.2100	0.2900	0.0700	0.3100	0.0325
10	2018	0.3200	0.0700	0.0800	0.2900	0.1300	0.1800	0.0293

Appendix 2: conversion of cross sectional and time series data in to panel form

. xtset Bank Years

panel variable: Bank (strongly balanced)

time variable: Years, 2009 to 2018

delta: 1 unit

Appendix 3: Test of model estimator between pooled OLS and random effect for sample private commercial banks.

xtreg DEPG INTRATE GOEXP MOSU INFLN LAR LR ROA, re

Random-effects GLS regression	Number of obs = 100
Group variable: Bank	Number of groups = 10
R-sq:	Obs per group:
within = 0.3167	min = 10
between = 0.8904	avg = 10.0
overall = 0.4000	max = 10
corr(u_i, X) = 0 (assumed)	Wald chi2(6) = 62.01
	Prob > chi2 = 0.0000

DEPG	Coef.	Std. Err.	t	P> t 	[95% Conf. Interval]	
INTRATE	1.553912	5.235191	0.30	0.767	-8.706875	11.8147
GOEXP	-.1584969	.6155026	-0.26	0.797	-1.36486	1.047866
MOSU	.5175479	.5869326	0.88	0.378	-.6328187	1.667915
INFLN	-1.059773	.274702	-3.86	0.000	-1.598179	-.5213666
LR	1.117496	.1679522	6.65	0.000	.7883162	1.446677
ROA	-7.857562	2.850574	-2.76	0.006	-13.44459	-2.270539
_cons	.0899615	.3121503	0.29	0.773	-.5218419	.7017649

sigma_u 0
sigma_e .21130977
rho 0 (fraction of variance due to u_i)

. xttest0

Breusch and Pagan Lagrangian multiplier test for random effects

$$\text{DEPG}[\text{Bank},t] = Xb + u[\text{Bank}] + e[\text{Bank},t]$$

Estimated results:

	Var	sd = sqrt(Var)
DEPG	.0770751	.2776239
e	.0446518	.2113098
u	0	0
Test: $\text{Var}(u) = 0$ chibar2(01) = 0.00 Prob > chibar2 = 1.0000		

Appendix 4: Test of model estimator between pooled OLS and fixed effect for sample private commercial banks.

. xtreg DEPG INTRATE GOEXP MOSU INFLN LR ROA, fe

Fixed-effects (within) regression	Number of obs = 100
Group variable: Bank	Number of groups = 10
R-sq:	Obs per group:
within = 0.3250	min = 10
between = 0.8523	avg = 10.0
overall = 0.3899	max = 10
	F(6,84) = 6.74
corr(u_i, Xb) = 0.2915	Prob > F = 0.0000

DEPG	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
INTRATE	-3.300997	5.143849	-0.64	0.523	-13.53011 6.928111
GOEXP	-.5796168	.6031154	-0.96	0.339	-1.778978 .6197443
MOSU	.7775031	.5650789	1.38	0.173	-.3462183 1.901225
INFLN	-.8598837	.2678289	-3.21	0.002	-1.392491 -.3272765
LR	.8474885	.1767842	4.79	0.000	.4959337 1.199043
ROA	-4.793168	3.26593	-1.47	0.146	-11.28783 1.701492
_cons	.3622592	.3079784	1.18	0.243	-.2501896 .974708

sigma_u .10479934
sigma_e .21130977
rho .19741091 (fraction of variance due to u_i)
F test that all u_i=0: F(9, 84) = 2.06 Prob > F = 0.4025

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