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Factors Affecting Deposit Growth of Private Commercial Banks In Ethiopia

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DEPARTMENT OF ACCOUNTING AND FINANCE

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FACTORS AFFECTING DEPOSIT GROWTH OF PRIVATE COMMERCIAL BANKS IN ETHIOPIA

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Declaration

This is to certify that the thesis entitled "Factors affecting deposit growth of private commercial banks: Evidence from Ethiopia", submitted in partial fulfillment of the requirements for the Master of science in Accounting and Finance of Department of Accounting and Finance, Bahir Dar University, is a record of original work carried out by me and has never been submitted to this or any other institution to get any other degree or certificates. The assistance and help I received during the course of this investigation have been duly acknowledged.

Seid Muhammed Saulih   _____   July, 2021

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APPROVAL OF THESIS FOR DEFENSE RESULT

As members of the board of examiners, we examined this thesis entitled "Factors affecting deposit growth of private commercial bank: Evidence from Ethiopia" by Seid Muhammed. We hereby certify that the thesis is accepted for fulfilling the requirements for the award of the degree of

"Masters of science in accounting and finance".

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Abbreviations and acronyms

AIB	AWASH INTERNATIONAL BANK
BOA	BANK OF ABYSSINIA
BR	BRANCH EXPANSION RATE
CAP	CAPITAL ADEQUACY
CBE	COMMERCIAL BANK OF ETHIOPIA
CBO	COOPERATIVE BANK OF OROMIA
CGR	CUSTOMER GROWTH RATE
DB	DASHEN BANK
DGR	DEPOSIT GROWTH RATE
GDP	GROSS DOMESTIC PRODUCT
IR	INTEREST RATE
JB	JARQUE-BERA
LER	LIFE EXPECTANCY RATE
LIB	LION INTERNATIONAL BANK
LOGDGR	LOGARITHM FORM OF DEPOSIT GROWTH RATE
NBE	NATIONAL BANK OF ETHIOPIA
NIB	NIB INTERNATIONAL BANK
OLS	ORDINARY LIST SQUARE
OIB	OROMIA INTERNATIONAL BANK
RE	RETURN ON EQUITY
UB	UNITED BANK
VIF	VARIANCE INFLATION FACTOR
WB	WEGAGEN BANK
ZB	ZEMEN BANK

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Abstract

Deposit is the most liquid money that is found within the treasury of the bank and which is prepared to be borrowed by a body in requiring of the fund. The main aim of this study was to examine factors affecting deposit growth of private commercial banks in Ethiopia. Ten private commercial banks were taken as a sample. The researcher used a purposive sampling technique to select those ten private commercial banks of Ethiopia. The data covered from the period 2010/11 -2019/20 was used for analysis. The data was collected from annual report of each private bank, annual report of national bank of Ethiopia and world bank data. Since the data was continuous in nature, a quantitative approach was used. From multiple linear regression model, fixed estimation technique was employed for regression analysis. Except life expectancy rate and branch expansion rate, all variable were statically significant at 5% significant level. Customer growth rate, capital adequacy, branch expansion, profitability, life expectancy rate and deposit interest rate affect deposit growth of private commercial banks positively. Whereas, the impact GDP growth rate was negative. The researcher concluded that, customer growth rate, deposit interest rate, profitability, GDP growth rate and capital adequacy were the most powerful variables which affect deposit growth rate of private commercial banks in Ethiopia. Finally, the researcher recommended that those private commercial banks should build their image to attract more customer and government should give a little bit of freedom to those private commercial banks to increase their deposit interest rate.

Key terms; private commercial banks of Ethiopia, deposit growth, macroeconomic and bank specific factors.

CHAPTER ONE: INTRODUCTION OF THE STUDY

This chapter gives a common overview of the study. In this chapter, background of the study, objective of the study, inquire about theories, importance of the study, scope of the study and organization of the paper are included.

1.1. Back ground of the study

Strong, well-developed and efficient financial system is the key driving factor in economic development of countries and it has positive impact on economic growth(Salami & Oluseyi, 2013).Banks play the dominant role in a bank-based financial system. They are important providers of financing for firms, and conversely, firms depend to a large extent on bank loans as a source of external financing. Banks are the most important deposit takers within the system(Schmidt & Hryckiewicz, 2006).

According to Bartley and Kresge (1991), the modern banking system was founded by the goldsmiths who existed during the 17th century in London and accepted deposit and granted loans with respect to the available excess gold standard. The word "bank" was also emerged because of they carried out their activities on a bench at road sides in London. However, the operations of a bank and the efficient ways of functioning has significant impact on the health and the stability of the economy(J. Harvey & Spong, 2001).

In most African countries at the time of independence, there was no central bank and banking was dominated by foreign-owned commercial banks(C. Harvey, 1996). After independence, new governments embarked on financial sector reform. This took a variety of forms, but the fundamental objective was increased lending to Africans and African-owned businesses, to correct the perceived bias of bank lending in the colonial period(C. Harvey, 1996).

The consequences of the post-1975 reforms in Ethiopia were also distinctive. Government ownership and government direction of lending might have been expected to undermine the banks as happened elsewhere in Africa. During the Derg regime, deposit mobilization was undertaken by public banks. At the end of the regime in 1991/92 all deposit (100%) were mobilized by Commercial Bank of Ethiopia (CBE) and the other two public banks were involved in making loan mainly to state enterprises. Following the fall of the regime, the issuance of free-market economic policy, and new banking business proclamation No 84/94, private banks were established and

started banking business since 1994. In 2010/11, due to the competition between the fourteen private banks and three public banks. the deposit mobilization shares of CBE fallen to 62.3%. The market share of the two public banks, Development Bank of Ethiopia and Construction and Business Bank was only 2.2% and 35.5%, respectively while the rest was mobilized by the fourteen private banks.

According to NBE (2019/20) report, there are two pubic and sixteen private commercial banks operating throughout the country. Those Commercial banks in Ethiopia are expected to play critical role towards the economy. This can be real when those commercial banks play an important role on Mobilization of resources. Specially, when they use their effort on deposit mobilization. Because, the success of the banking is greatly lying on deposit.

Deposit is the most liquid money that's found within the treasury of the bank and which is prepared to be borrowed by a body in requiring of the fund. Deposit is an agreement between the client and the bank under which the client deposit a sum of money with the bank for the purpose of preservation or investment and the bank undertakes to refund the money to the client at a certain date upon request, according to terms agreed upon in advance(Amer & Mohammed, 2017).

Deposit is the chief source of funds to attempt loaning operations. Additionally, for beneficial operation, the sum of the deposit is exceptionally critical. Mobilization of deposit for a bank is as fundamental as oxygen for a human being(Tuyishime, Memba, & Mbera, 2015).

As financial intermediaries, banks are in the business of attracting deposit from individuals, businesses, and other organizations and then lending such funds to their customers with current credit needs. A bank's success in finding depositors consequently plays a critical role in its ability to satisfy customer credit demands and perform other banking functions. Moreover, much of a bank's profitability is derived from gathering deposit at one set of interest rates and then lending or investing these funds at higher rates. These key roles that deposit play in overall bank performance have thus drawn much attention to bank funding practices and the ability of individual banks to maintain or expand their deposit base(J. Harvey & Spong, 2001). 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)(Gunasekara & Kumari, 2018).However, banks cannot exist without deposit as according to(Garo, 2015), deposit referred to as the oxygen of banks. Banks contribute to the economic growth by facilitating investment and increasing capital

accumulation and it is capable only if the banks have satisfied amounts of deposit. Deposits are also the working capital of the economy and the sustainability and the profitability of banks are impossible without the deposit. Therefore, deposit mobilization is the primary function of the banks. Banks are striving to mobilize deposit as it is the fundamental objective of all banks. However, banks use deposit as sources of funds for loans and investments and also banks working with a smaller capital when compared with the other institutions since because they have potential to use deposit to initiate, expand and maintain their banks. Therefore, banks can earn high profits due to deposit.(Gunasekara & Kumari, 2018).

According to Namazi and Salehi (2010),financial resources of banking system is naturally provided from people's deposit. Therefore, we can say that deposit is the most important resources of commercial banks. Thus, the amount of deposit a commercial bank should have at hand should be enough to make the bank involve in the market and to satisfy the financial needs of its customers. Given this general fact the bank is expected to manage its deposit.

Different researchers including Fisseha (2011); Islam, Ali, and Wafik (2019); Matusalem (2020); Nafkot (2016); Shemsu (2015); Wubitu (2012); Yakubu and Abokor (2020) carried out researches to determine factors affecting private commercial bank's deposit growth. Their results were inconsistent towards the effect of real GDP growth rate, deposit interest rate, branch expansion and other variables on deposit growth. This inconsistency result among researchers may be, the sample size limited by some private bank or only commercial bank of Ethiopia (in case of Ethiopia), and also, little attention given by researchers on the determinant of deposit growth in private commercial banks and macroeconomic policy differs from country to country. The reason for conducting this study is to examine factors affecting the deposit growth of private commercial banks in Ethiopia. and by increasing the sample size to ten private commercial banks of Ethiopia and by adding new variables such as; life expectancy rate and customer growth rates in addition to the above common variables.

1.2. Statement of the problem

Ethiopians depend more on informal institutions for their money-related need. According to Mengestu (2018),Although 62% of Ethiopians reported saving money in the year 2017, only 26% saved formally at financial institutions, while 38% saved with a person outside of a family or at an informal saving club such as Iqub and saving and credit association. That means money is kept in traditional way and majority of population are unbanked. This indicate that, there is a serious problem of deposit growth of private commercial banks in Ethiopia.

As per Mengestu (2018), the percentage of adults with an account ownership in Ethiopia rose to 35% in 2017 from 22% in 2014. Despite this increment, Ethiopia lags behind its neighboring countries. for example, In Kenya, 82% of adults have an account, while in Rwanda, account ownership stands at 50%. This shows that, deposit mobilization practice among commercial banks in Ethiopia is not developed.

According to NBE (2010/11) annual report, despite the arrival of two new private banks and opening of 61 new branches by private commercial banks, the share of private banks in deposit mobilization went down to 33.3 percent from the previous year of 35.2 percent. And also, Based on NBE (2019/20) annual report, The share of private commercial banks in total deposit mobilization increased to 42.6 percent Even if there is increment in share of deposit growth, private commercial bank are characterized by several problems in relation to deposit growth. From the year 2010/11 to 2019/20 the average percentage share increment of private commercial bank in deposit mobilization relative to public commercial bank of Ethiopia is 1.64 % which is very low. This indicates that, deposit mobilization in Ethiopia largely dominated by the two public banks.

Managing deposit isn't possible without knowing and controlling the factors influencing it. In literature, there are several variables that are claimed to be determinants of deposit growth. The result of the study undertaken in our country as well as outside Ethiopian related to the topic revealed that bank's deposit can be influenced by distinctive variables such as real GDP development, branch expansion, loan to deposit proportion, Deposit rate and profitability credit risk, exchange rate, Money Supply, Inflation, population growth, and Government Consumption. According to the research conducted by Fekadu (2019); Matusalem (2020); Okere and Ndugbu (2015); Simeon (2017); Tenaye (2019); Zewde, Lemie, and Tarekegn (2018) branch expansion has a positive and significant impact on the deposit growth of private commercial banks.

In contrast, the research conducted by Islam et al. (2019) shows that, branch expansion has a negative impact on the bank's deposit growth.

The investigation conducted by Boadi, Li, and Lartey (2015); Fekadu (2019); Matusalem (2020); Samantaraya and Patra (2014)indicates deposit interest rate has positive and significant effect on deposit growth. On the other hand Ongeti (2016)argue that, the impact of deposit interest rate was moderate. Additionally, Ketema (2017)argue that, the impact of deposit interest rate on deposit growth was positive but insignificant. In contradict to the above all literatures about deposit interest rate. Tenaye (2019)argue that, deposit interest rate has negative and significant effect on deposit growth.

The study conducted by Islam et al. (2019) concluded that, GDP growth has a negative impact on private commercial banks of Bangladesh. In contrast, the regression result of Dereje (2017); Firdawek (2019); Kassa (2017); Modigliani (1986); Samantaraya and Patra (2014); Simeon (2017); Tenaye (2019); Yakubu and Abokor (2020), concluded that, GDP growth has positive and significant effect on deposit growth of private commercial banks.

Finally, the research conducted by Dereje (2017); Firdawek (2019) shows that, profitability has positive and statistically insignificant impact on Bank's deposit. Whereas the regression result of Tenaye (2019)shows that, profitability has a significant and Negative impact on Bank's deposit. In general, the inconsistency funding among researchers, may be the sample size was limited by some private bank or only commercial bank of Ethiopia (in case of Ethiopia), an also, little an attention given by researchers on the determinate of deposit growth in private commercial banks and macroeconomic policy difference from country to country.

As the researcher highlighted above, prior researchers mainly focused on common factors. Such as real GDP growth, Deposit interest rate, profitability, capital adequacy and branch expansions and they got different results for the same variable. In order to fill this literature gap, the researcher motivated to undertake a research by taking ten established private commercial banks of Ethiopia as a sample. In this study the effect of the profitability, interest rate, capital adequacy, branch expansion and GDP growth rate on private commercial bank's deposit growth was examined again in order to alleviate the ambiguity towards their effects on private commercial bank's deposit growth. Furthermore, unlike former researchers, this study examined the effect of, life expectancy rate, and customer growth rate on private commercial bank's deposit growth in econometric way for the first time.

1.3. Objectives of the Study

1.3.1. General Objective

The main objective of the study is to examine factors affecting deposit growth of private commercial banks in Ethiopia.

1.3.2. Specific objectives

The following are specific objective of the study

1. To analyze the trend of deposit growth of private commercial banks.
2. To examine the effect of macro-economic factors (such as; - life expectancy rate, deposit interest rate, and GDP growth rate) on deposit growth of private commercial banks.
3. To examine the effect of bank specific factors (such as; - customer growth rates, branch expansion rate, capital adequacy and profitability) on deposit growth of private commercial banks.

1.4. Research hypothesis

H1: Deposit interest rate has a significant impact on Deposit growth of Ethiopian private commercial Banks.

H2: Life expectancy rate has a significant impact on Deposit growth of Ethiopian private commercial Banks.

H3: GDP growth rate has a significant impact on Deposit growth of Ethiopian private commercial Banks.

H4: Branch expansion rate has a significant impact on Deposit growth of Ethiopian private commercial Banks.

H5: Capital adequacy has a significant impact on Deposit growth of Ethiopian private commercial Banks.

H6: Profitability has a significant impact on Deposit growth of Ethiopian private commercial Banks

H7: Customer growth rate has a significant impact on Deposit growth of Ethiopian private commercial Banks.

1.5.   Significance of the study

The following are the main importance of the study.

The study may help private commercial banks to manage their deposit by letting them know what influences it and which variable is the foremost important. It may give a direction for policymakers by showing the main macro-economic factor which affecting deposit growth of those private commercial banks of Ethiopia. The study may offer assistance to another analyst who needs to research in the same field and related areas by giving bits of knowledge that must be considered in their investigation and how the industry should be approached. Finally, the study may increase the researcher's horizon of knowledge.

1.6.   Scope/delimitation of the study

According to NBE (2010/11) Despite the arrival of two new private banks and the opening of 61 new branches by private commercial banks, the share of private banks in deposit mobilization went down by 5.4 %. In addition to this, in 2011, the monetary authorities issued a directive requiring private banks to purchase NBE bills equivalent to 27 percent of any new loan disbursements. These bills have a low interest-earning of 3 percent and a maturity of 5 years.

To examine factors that influence private commercial bank deposit growth in Ethiopia after those two events, the study used ten years' panel data from the period 2010/11-2019/20.

1.7.   Limitation of the study

Even if the study had well performed, it had its own limitation. The following were some problem faces by the researcher during the investigation.

At the beginning the researcher select some variables which are not included in any other research. Those were financial literacy rate and unemployment rate. But, during the investigation the researcher exclude those variables. Because, there was no available and adequate information. The other constrain faced by the researcher was time constrain. The time provided for this thesis was one semester. It is very short to conduct a good master's thesis.

1.8. Organizations of the thesis

The thesis would contain five chapters. Chapter one focuses on introductory aspects including the background of the studied area, statement of the problem, objectives of the study, significance, scope, and limitation of the study. Chapter two would present the review of related literature. Chapter three would present the researched design and methodology including the data source and method of data collection, the sampling techniques used, and the measurement and analysis parts. Chapter four would contain data presentation, analysis, and interpretation. Finally, chapter five would include the conclusion and recommendation.

CHAPTER TWO: REVIEW OF RELATED LITERATURE

2. Introduction

This chapter consists the theoretical and empirical parts of related literature. In the theoretical review part, the theories that state the commercial bank's deposit and the variables that were claimed to affect it had been discussed. The empirical literature part discusses past studies that were conducted in the area of factors determining commercial bank's deposit. In this part, the variables that were included, the methodology that was used to undertake the study, and the results of the studied under review had been discussed

2.1. Meaning and concepts of deposit

Deposit is foundations upon which banks thrive and grow. They are unique items on a bank's balance sheet that distinguish them from other types of business organizations. The ability of a bank's management and staff to attract checking and savings accounts from businesses and individuals is an important measure of the bank's acceptance by the public. Deposit provide most of the raw materials for bank loans and thus represent the ultimate source of bank profits and growth(Varman, 2005).

2.1.1. Types of deposit

According to Venkatesan (2012) Bank deposit is broadly classified into saving deposit, Current deposit, and Fixed (term) deposit.

Current deposit: It is a deposit generally used by businessmen, industrialists, and others to settle debts. This current deposit, on which cheques are issued, are also known as demand deposit. They are mostly non-interest bearing.

Saving accounts: These accounts are opened by many people who need to save their wealth usually beyond current consumption and in anticipation of future investment such as building their own house, buy a car and self-sponsor education, etc. In doing so the account holder earns interest on the saving balance. Saving accounts are the most favored deposit account for commercial banks as they are cheap and are usually stable in nature. They are the services with which banks reach out to a broad mass of people.

Fixed or Term Deposit: These deposits are kept by the bank for a specified period of time per the agreement between the bank and depositor. A higher interest rate is paid by the banks for such

kinds of deposit depending upon the number of deposit and the length of period for keeping the deposit as per the agreement of both parties.

2.2. Theoretical Review

Theories are formulated to explain, predict, and understand phenomena and to extend existing knowledge within the limits of critical bounding assumptions. The theoretical framework is the structure that can hold or support a theory of a research study. The theoretical framework introduces and describes the theory that explains why the research problem under study exists.

In order to explain and predict the relationship between deposit growth and it's factors the following theories are reviewed. Among those popular theory, the Classical Theory of Interest, the permanent income hypothesis (Friedman, 1957), the life cycle hypothesis(Modigliani, 1986), and (Keynes, 1936),buffer-stock theory (Carroll, Hall, & Zeldes, 1992) are included.

2.2.1. The Classical Theory of Interest

According to the classical theory interest rate, the rate of interest rate is determined by the intersection of demand for money and supply of money. Interest is the price of investment because firms borrow money for investment. Thus, households save their money to earn an interest rate. According to this theory, a High-interest rate leads to high savings and a low-interest rate leads to low savings. Thus, saving is directly (or positively) related to the interest rate. Firms' demand for investment is fulfilled by households' savings. Thus, the interest rate in the goods market is determined at the point where both supplies of saving and demand for investment crosses each other or intersect each other. In classical theory, saving is an increasing function of the rate of interest,

This theory is related to the study as it presents the relationship between deposit and interest rate. As deposit interest rate increase leads to increase in deposit.

2.2.2. The permanent-income hypothesis of savings

The permanent income hypothesis argues that, consumption is proportional to a consumer's estimate of permanent income. Money is saved for a period in life where income might be below this personal permanent income level. The underlying motive to save is the desire to smooth out

fluctuations in income so that they save during periods of unusually high income and dissave during periods of unusually low income(Friedman, 1957).

According to the permanent-income hypothesis, consumption at a particular point in time is dependent on not only on one's current income but also on their expected future income (permanent income). The theory postulates that, a consumer will save only if he/she expects that his/her long-term average income (permanent income) will be less than his current income.

This theory is related to the study as it presents the relationship between deposit(saving) and personal expected income. As decrease expected income leads to increase in deposit(savings).

2.2.3. Buffer theory of capital adequacy

Banks may be more willing to maintain a "buffer" of excess capital to reduce the likelihood of meeting legal capital requirements, especially when their capital adequacy ratio is highly unstable.

Capital requirement is Ethiopian's main banking supervision tool. The National Bank of Ethiopia rarely intervenes in the bank's activities, the violation of capital requirements is considered a major violation of banking law and will not be tolerated by the National Bank of Ethiopia. If deposits from the public are not fully mobilized, banks will need more capital. Capital is more reliable and trustworthy and can be used for long-term planning. The ability of banks to mobilize sufficient deposit prevents erosion of the capital base. Calem and Rob (1996) buffer theory predicts that banks close to the minimum regulatory capital ratio may have an incentive to increase capital, and reduce risks to avoid regulatory costs. This theory relates with the topic as follow.

An appropriate level of capital adequacy can ensure that the bank has sufficient capital to expand its business and that its net assets are sufficient to absorb any financial downturn without being insolvent. If bank has higher capital adequacy ratio it can absorb higher deposit by using its capital as its strength. So, from this as capital adequacy increase leads to increases deposit growth of private commercial banks.

2.2.4. Life-cycle hypothesis

It is an economic theory that, describes the spending and saving habits of people over the course of a lifetime. The Life-Cycle Hypothesis posits that the main motivation for saving is to accumulate resources for later expenditure and in particular to support consumption at the habitual standard during retirement. According to the model, saving should be positive for households in their

working span and negative for the retired ones, and wealth therefore should be hump-shaped(Modigliani, 1986).

This hypothesis emphasized how saving might be utilized to transfer obtaining control from one stage of life to another. In early life, labor wage is usually low relative to afterward working years. Salary typically peaks within the final portion of the working life, then drops at retirement. Customers who wish to smooth utilization will favor borrowing during the early low-income years, reimburse those credits and build up wealth during the high-income years, then spend off the collected savings during retirement.

This theory is related to the study as it presents the relationship between deposit(saving) and personal income. According to the model, saving should be positive for households in their working span (when income is high and negative for the retired ones (when income is low).

Both the life cycle and permanent income theories point to an obvious assumption that individuals will automatically save depending on their level of income as current or anticipated in the future period.

2.2.5. The buffer-stock theory of savings

According to Carroll et al. (1992),This theory postulates that, individuals shield their consumption against unexpected fluctuations in income by holding more assets. It argues that, consumers are impatient and prudent in the face of unpredictable income fluctuations. The buffer-stock theory assumes consumers to be impatient because they resort to borrowing against future income in order to meet (finance) current consumptions if income were certain, and also as prudent because they have precautionary motives. To avoid or avert the dangers associated with future fluctuations in income and also retain a smooth consumption pattern, individuals are forced to set aside some precautionary reserves by way of reducing current consumption in order to save against the contingent occurrences. Hence, one will anticipate the savings rate to be pro-cycle, with people saving more when earnings are higher, in arrange to smoothen utilization in bad times.

2.3. Empirical review

This section provides the relevant empirical review related to deposit growth which were conduct out of Africa, in Africa and specifically inside Ethiopia. It also presents factors that affect deposit growth of private commercial banks with supportive theorical and empirical evidence.at the end

this section contains description of variables which are used in the study, summary of literature gap and conceptual framework.

2.3.1. Empirical review out of Africa.

Kanj and El Khoury (2013) conducted research on the topic "determinants of Non-Resident Deposit in Commercial Banks: Empirical Evidence from Lebanon" The result of the study provided empirical evidence on a positive and significant effect of age, income, and education on household's decision to save; whereas household size, distance to formal financial institutions and employment status negatively influenced their decision to save. Concerning the extent of saving; income of a household, level of education, landholding size, and involvement in petty trade activities showed a positive significant effect on the amount of saving; whereas household size, employment status, and distance to formal financial institutions significantly reduced the amount of saving by households. The finding also implied the need for designing strategies that could improve the saving behavior, mobilization, and diversification of saving by households. Finally, they recommend building capacity through education and information systems in mobilizing saving as well as encouraging financial institutions to implement door-to-door service provisions to enhance the saving behavior of households are desirable.

There was a study conducted by Islam et al. (2019) on Determinants of Deposit Mobilization of Private Commercial Banks in Bangladesh. The results of the study indicate that, deposit interest rate, loan-to-deposit ratio, inflation rate and broad money growth rate have positive impact on deposit growth whereas number of bank branches, company size and GDP growth rate have negative impact on the banks deposit growth rate.

According to the research conducted by Yakubu and Abokor (2020) on the title" Factors determining bank deposit growth in Turkey: an empirical analysis" revealed the results that, bank stability, banking sector efficiency, broad money supply, economic growth and inflation are significant determinants of deposit growth in the long run. The finding also further shows that, in the short run, only branch expansion and broad money supply are relevant for bank deposit mobilization.

Haron and Azmi (2008) did a study on "Determinants of Islamic and conventional deposit in the Malaysian banking system" their outcome shows, determinants such as rates of profit of Islamic bank, rates of interest on deposit of conventional bank, base lending rate, Kuala Lumpur composite index, consumer price index, money supply and gross domestic product have different impact on deposit at both Islamic and conventional banking systems. In most cases, customers of conventional system behave in conformity with the savings behavior theories. In contrast, most of these theories are not applicable to Islamic banking customers. Therefore, there is a possibility that religious belief plays an important role in the banking decisions of Muslim customers

Ostadi and Sarlak (2014), studied on effective factors on the absorption of bank deposit in Isfahan Sepah Bank. The aim of the study was determining the effective factors on the absorption

of bank deposit in Isfahan Sepah bank. The result of the study indicates that, e-banking parameters, such as; - relative contribution of POS and ATM have a positive and significant effect on bank deposit. The effect of interest rates and the money supply increases the relative share of bank deposit. The effect of inflation and other variables such as market shares of competing money markets are negative and significant. On the one hand inflation versus fixed interest decreases the value of money; on the other hand, with the boom in the stock market on the contrary to fixed interest rates, money market deposits go toward this bazaar. The effect of production is positive and significant on the share of deposit. The effect of exchange rates on deposit is negative.

Samantaraya and Patra (2014) Carrie out research on the title" determinants of Household Savings in India". Their results indicate that, both in the long run and in the short run, GDP, dependency ratio, interest rate, and inflation have a statistically significant influence on household saving in India. they suggested that, ensuring price stability and avoiding any disruption to the growth process will be useful for augmenting savings and sustaining the savings-growth spiral in India.

2.3.2. Empirical review in Africa.

According to Ongeti (2016) real deposit interest rate affects saving mobilization of the commercial bank to a moderate extent. The study also concludes that, economic growth has a significant influence on saving mobilization in commercial banks in Kenya. The research further concludes that, structural infrastructure has a great influence on saving mobilization. Based on his finding, He recommended that, commercial banks should reduce it real deposit interest in order to attract more customers to save in their banks. Commercial banks should come up with policies to adjust

their interest rate that are favorable to customers. At the end he also recommended government should gear its efforts towards reducing domestic inflation in order to arrest its negative impact on both real interest rates and spread.

The study conducted by Boadi et al. (2015) revealed that, interest rate liberalization and gross domestic product jointly accounted for about 78% of the variation in the level of bank deposit in Ghana. The study has also shown that, liberalization of the interest rates has made it attractive for people with idle funds to save with financial institutions especially, banks. It also revealed a negative relationship between the real savings rate and the real treasury bill rate expected in a high inflationary environment. Finally, they recommended that, Bank of Ghana remains resilient on interest rate liberalization so that surplus funds can be made available for investors and also, to reduce the level of inflation in Ghana.

A study investigated by Raphael (2013) shows, most commercial banks in east Africa are operating under a decreasing return to scale. Therefore, inefficient utilization of input resources (technical inefficiency) could be one of the reasons for the inefficiency of commercial banks in East Africa; he recommended commercial banks should use underutilized resources and reduce operating expenses to be relatively efficient in the production frontier.

The outcome of the study conducted by Okere and Ndugbu (2015) on the topic "Macroeconomic Variables And Savings Mobilization In Nigeria." Shows that, Per-Capital Income and Number of Bank Branches have a positive and significant impact on domestic savings mobilization in Nigeria. But specifically, financial deepening seemed to has a greater impact on savings mobilization in Nigeria. Inflation and exchange rate revealed an inverse relationship with domestic saving mobilization in Nigeria. They recommended that, efforts should be geared towards continuous and well-articulated fiscal and monetary policies that will sustain this growth in the financial sector. Also, Government should ensure that adequate macroeconomic policies will be put in place to attract foreign investors, encourage export, and make Nigeria an export platform where export goods could be produced, this will help to strengthen Nigeria's exchange rate and induce domestic savings. Finally, they recommended that, proper measures should be undertaken to encourages banks to open branches in the rural areas to mop up deposit. The rural banking policies should be modified and implemented in Nigeria.

Jibrin, Danjuma, and Blessing (2014) carried out a study on the topic "Private Domestic Savings Mobilization by Commercial Banks and Economic Growth in Nigeria". Their finding shows that, money supply and per capita income are strong determinants of private domestic savings for the period. Private domestic savings and commercial banks credit to the private sector turns out to be the leading factors that propel economic growth in Nigeria. According to this research result unethical banking practices by Nigerian commercial banks have rendered interest rates impotent to drive savings mobilization.

The study conducted by Byusa (2016) indicate that, there is a significant influence of institutional and external environmental factors on savings mobilization of commercial banks in Rwanda. The institutional factors were: inappropriate work incentives characterized by inadequate salary enumeration which does not foster staff motivation and commitment to the savings mobilization function; and inappropriate rewards and sanctions which do not significantly impact employee motivation, job commitment and performance in savings mobilization.

The major external factor was competition with other deposit-taking institutions which is partly attributed to the conducive regulatory environment provided by the National Bank of Rwanda which fosters entry of many other players like Micro Finance Institutions, which offering similar deposit products. Finally, the researcher recommended that, management of commercial banks need to re-focus their performance management policies and strategies towards improving remuneration of employees to enhance staff motivation and job commitment. And also, the banks should devise innovative measures to position more strategically and competitively to attract more savings.

2.3.3. Empirical review in Ethiopia

According to the study conducted by Zewde et al. (2018) on the topic "Determinants of Deposit Mobilization in Ethiopian Commercial Banks", provide conclusion that loan loss provision and loan to deposit ratio have negative and statistically significant impacts on deposit of Ethiopian commercial banks while profitability, capital adequacy ratio and branch expansion have a positive and statistically significant impact on deposit.

The result of Bogale, Amsalu, and Melikamu (2014) shows age, income and education have positive and significant effect on household's decision to save; whereas household size, distance to formal financial institutions and employment status negatively influenced their decision to save.

With regard to the extent of saving; income of a household, level of education, landholding size and involvement in petty trade activities showed a positive significant effect on the amount of saving; whereas household size, employment status and distance to formal financial institutions significantly reduced the amount of saving by households. Their finding also implied that the need for designing strategies that could improve the saving behavior, mobilization and diversification of saving by households. Finally, they recommend building capacity through education and information systems in mobilizing saving as well as encouraging financial institutions to implement door-to-door service provisions.

The study conducted by Tenaye (2019), aimed to find the determinants of Private Commercial Banks' Deposit Growth in Ethiopia. the final result achieved by applying panel data techniques indicate that, number of bank branches, economic growth (GDP) and age of company had positively and statistically significant influence on private bank deposit growth; whereas, deposit interest rate and net interest margin are negative and statistically significant influence on deposit growth. and also, loan to deposit ratio had negative and insignificant influence on private commercial bank deposit growth. The study implies that, motivation of economic growth. The study recommended to the stockholders and users of the banking industry to expand. number of branch and create appropriate awareness mechanisms for the society.

Analysis made by Sisay (2013) shows that, the reconstruction of Addis Ababa roads, Aggressive branch expansion of the commercial bank of Ethiopia, the current condominium house construction program, peoples attitude towards using private banks, and poor parking area strongly influences the deposit mobilization process of Awash International Bank S.C. Opening of additional branches, aggressive promotion, and upgrading service deliverance can boost the deposit balance of a bank positively. The study suggested that, the management of the bank should arrange and apply incentive programs such as coupon prizes to attract more depositors, open additional branches near to the customers, promote excellent services.

The study conducted by Simeon (2017) shows that, all the explanatory variables such as Economic Growth or GDP ,Inflation, Interest Rate Payable for Bank Deposit, Exchange Rate, Branch Inauguration ,Population Growth Rate and Financial Innovation were positively correlated with the explained variable. Among these variables, branch opening is an important strategy for deposit growth and highly significant than others. GDP or economic growth of the country is also next to

branch opening is significantly affects CBE's deposit. And finally, He recommended the need for strong public awareness and sustainability of the prize linked scheme.

Fekadu (2019) did a study to determine factors affecting deposit Mobilization in the case of Dashen Bank Sc. Addis Ababa branch. The result of the study revealed that, independent variables such as Service Quality, Branch Expansion, Interest Rate, Technology, Disposable Income, and Market strategy are positively and statistically significant on the bank deposit growth. Finally, He recommended Dashen bank to apply the aforementioned independent variables to attract and retain more deposit and customers.

According to the analysis made by Samuel (2015) on the topic "Challenges of Deposit Mobilization for Private Commercial Banks in Ethiopia in the Case of Awash International Bank S.C.)", Awash International Bank and other private banks are operating in a dynamic and highly competitive environment and there is a high possibility of catch-up and by-pass among these banks. He recommended that, in order to solve the paradox of the liquidity problem and the unbanked resources awash international bank should use its maximum effort.

The result of the investigation made by Ketema (2017) shows, credit risk, exchange rate, and Bank Profitability are positively and statistically significant on bank deposit growth; whereas, the Loan to Deposit ratio and Money Supply influence is negatively and statistically significant on bank deposit growth. Deposit Interest Rate had an insignificant positive influence on bank deposit growth. Whereas Inflation and Government Expenditure had an insignificant negative influence on bank deposit growth. The researcher recommends that, Government should decrease the broad Money Supply to the economy since it had a negative significant effect on deposit mobilization. The depositor confidence will increase if the commercial banks are profitable and have adequate asset return. So, commercial banks should sustain their profitability to increase their amount of deposit. Commercial Banks should also decrease their outstanding loan and advance to reduce their credit risk and decreases their liquidity by mobilizing more fixed time deposit instead of individual and demand deposit since credit risk had a positive and significant effect on bank deposit.

The result of the analysis made by Dereje (2017) indicates, disposable income, real GDP growth, branch expansion, is positively and statistically significant on bank deposit growth; whereas, loan to deposit ratio (bank's liquidity) influence is negatively and statistically significant on bank

deposit growth. Deposit rate and profitability had an insignificant positive influence on bank deposit growth. Whereas population growth and capital to loan ratio (capital adequacy) had an insignificant negative influence on bank deposit growth. The study also implies that, stimulation of economic growth is the most important factor that affects bank deposit growth. He recommended that, private commercial banks should have to intensify branch expansion to areas where there are potential deposit sources even to remote locations. moreover, private commercial banks are required to have enough liquid assets to meet the demand for cash outflows to generate and sustain public confidence of the depositors.

Firdawek (2019) did a study on the topic "Determinants of Deposit in Ethiopian Private Commercial Banks" The result reveals that, disposable income, real GDP growth, branch expansion, are positively and statistically significant on bank deposit growth; whereas, loan to deposit ratio (bank's liquidity) influence is negatively and statistically significant on bank deposit growth. Deposit rate and profitability had insignificant positive influence on bank deposit growth. Whereas population growth and capital to loan ratio (capital adequacy) had insignificant negative influence on bank deposit growth. The study implies that, a stimulation of economic growth is most important factor that affects bank deposit growth. The researcher recommended that private commercial banks should have to intensify branch expansion to areas where there are potential deposit sources even to remote locations. Moreover, private commercial banks required to have enough liquid assets to meet the demand for cash outflows so as to generate and sustain public confidence of the depositors.

2.4. Summary of literature and literature gap

Depend on the above theoretical and empirical review, deposit mobilization is the major activity for all banks especially for commercial banks since their function is mobilizing deposit to meet the required liquidity for credit customers of the banks.

The result of different researchers revealed that, bank's deposit can be affected by different factors such as disposable income, real GDP growth, branch expansion, loan to deposit ratio, Deposit rate and profitability credit risk, exchange rate, Money Supply, Inflation population, and Government Expenditure.

As it was discussed in the literature review part, most of the study undertaken in our country as well as outside Ethiopian related to the topic of determinates of deposit growth focus on separately treating the total deposit amount to the private commercial banks and some factors that are

reviewed by different researchers' indifferent research techniques also showed a different effect on Bank deposit.

According to the research conducted by Fekadu (2019); Matusalem (2020); Okere and Ndugbu (2015); Simeon (2017); Tenaye (2019); Zewde et al. (2018) branch expansion has a positive and significant impact on the deposit growth of private commercial banks. That means as the bank work extensively on branch expansion the deposit growth also shows a dramatic positive change. In contrast, the research conducted by Islam et al. (2019) shows that, branch expansion has a negative impact on the bank's deposit growth. This means if the bank work extensively on branch expansion, results decrease in the amount of deposit.

The investigation made by Boadi et al. (2015); Fekadu (2019); Matusalem (2020); Samantaraya and Patra (2014)indicates, deposit interest rate has positive and significant effect on deposit growth. That mean as the bank increase deposit interest rate, households and business will be attracted to save to get interest income. These results increase the deposit of the bank. On the other hand Ongeti (2016) argue that, the impact of deposit interest rate was moderate. Additionally,Ketema (2017) argue that, the impact of deposit interest rate on deposit growth was positive but insignificant. which means depositors cannot affected by deposit interest rate or their motive to save is not interest. In contradict to the above all literatures about deposit interest rate.Tenaye (2019) argue that, deposit interest rate has negative and significant effect on deposit growth which means as deposit interest rate increase leads to decrease deposit of the bank.

Finally, the analysis made by Fisseha (2011); Islam et al. (2019); Matusalem (2020); Yakubu and Abokor (2020)shows that, inflation rate has positive and significant effect on deposit growth. Whereas the study made by Nafkot (2016)argue that, inflation has no significant effect on deposit growth. That means if inflation rate increase or decrease there was no change on deposit growth.

In general, both macro-economic and micro-economic factors are determinant of deposit growth of private commercial banks and there is inconsistence of finding among literature. This inconsistency of funding among researchers may be due to sample size is limited by some private bank or only commercial bank of Ethiopia (in case of Ethiopia), and also, little attention given by researchers on the determinate of deposit growth in private commercial banks and macroeconomic policy difference from country to country.

In order to fill this literature, gap the researcher motivated to undertake a research in this particular area by adding new addition variable and by increasing the sample size.

2.5. Factors affecting deposit growth of private commercial banks in Ethiopia

A. Deposit Interest Rate

Deposit interest rate is the rate paid by financial institutions to deposit account holders or it is expected return for depositor.

The main focus of every financial system is financial intermediary that is, mobilizing financial resources from the surplus sector and lend to the deficit outlets to facilitate business transactions and economic development based on the monetary and fiscal policy of the nation(Tenaye, 2019). The reason for getting the deposit from the surplus sector is interest payment, which must be reasonable and acceptable to the owner of the money.

The classical theory of interest otherwise called the demand and supply theory of interest, maintains that the rate of interest is determined by the demand for and the supply of funds by businessmen and households respectively. The supply of funds is governed by the time preference and the demand for capital by the expected productivity of capital.

The life-cycle theory presented that the net impact of the real interest rate on savings is vague. The net impact of the real interest rate on savings can be decomposed into two impacts. The substitution impact infers that a higher interest rate increases the current price of consumption relative to the future cost, and thus affecting savings positively. The other effect, which is called the income effect, demonstrates that if the household is a net moneylender, an increase in the interest rate will increase lifetime income, and so increase consumption and diminish saving. Subsequently, it is anticipated that the interest rate will have a positive impact on the savings ratio only when the substitution effect dominates the income effect. In developing countries where financial markets are still not well developed, the substitution effect is anticipated to be much greater than the income effect, and hence the real interest rate is likely to have a net positive impact on household savings. Deposits are more interest rate sensitive and banks may choose to increase investments in interest rate sensitive assets and to decrease investments in loans(Betubiza & Leatham, 1995).

Based on the above empirical & theoretical review the following hypothesis has been developed.

H1: Deposit interest rate has a significant impact on Deposit growth of Ethiopian private commercial Banks.

B. Branch expansion rate

The availability of banking services in a country can be measured by the total number of bank branches. The good Bank site occupies in the ability of the positive impact in attracting deposit. This is due to the difficulty of movement of people from one place to another and the difficulties they face in traffic, distinct positions available and free for customer service.

Branch banking is the operation of storefront locations away from the institution's home office for the convenience of customers(Kagan, 2020).

According to the research conducted by Fekadu (2019); Matusalem (2020); Okere and Ndugbu (2015); Simeon (2017); Tenaye (2019); Zewde et al. (2018) branch expansion has a positive and significant impact on the deposit growth of private commercial banks. That means as the bank work extensively on branch expansion the deposit growth also shows a dramatic positive change. In contrast, the research conducted byIslam et al. (2019) shows that branch expansion has a negative impact on the bank's deposit growth. This means if the bank work extensively on branch expansion, results decrease in the amount of deposit. Depend on the above empirical and theoretical review the following hypothesis has been developed.

H2: branch expansion rate has a significant impact on Deposit growth of Ethiopian private commercial Banks

C. GDP growth rate

According to Bureau of Economic Analysis (BEA), Gross domestic product (GDP) is the value of the goods and services produced by the nation's economy less the value of the goods and services used up in production. GDP is also equal to the sum of personal consumption expenditures, gross private domestic investment, net exports of goods and services, and government consumption (Dynan & Sheiner, 2018).

Various economic theory and empirical evidences confirm that an increase in people income influences positively their savings capacity. According to Abou El-Seoud (2014),Real GDP growth rate has positive and significant effect on national saving of the country. The basic assumption of the life-cycle theory of saving and consumption predicts that changes in an economy's growth rate will influence its total saving rate. In the simplest version of the model in which young individuals save for retirement and old individuals consume their previously accumulated assets an increment in the rate of economic growth will leads for an increment in

the total saving rate. Since it increases the lifetime resources (and saving) of younger age groups relative to older-age groups. In this way, nations with a better GDP growth rate are anticipated to have higher savings ratios than nations with lower GDP growth rates. It is expected that GDP growth rate will positively be correlated with private Bank's deposit growth.

H3: GDP growth rate has a significant impact on Deposit growth of Ethiopian private commercial Banks

D. Customer growth rate

Customer Growth Rate reflects how you are doing as a company and if what you are providing your market is something that is growing in demand.

According to David and Yi (2019), customer growth rate is the speed at which you gain new customers over defined periods of time. Growth rate is usually measured with a monthly period. But in this study the customer growth rate of selected private banks of Ethiopia will measured in yearly period. customers are the most important factors who play a crucial role in the growth of banks deposit.

According to Vuong, Duy Tung, Giao, Dat, and Quan (2020) ,customers experience is complicated shopping process when they make a decision to select a suitable service to satisfy their demand. The process of selection, usage, and evaluation of banking services usually consist of three different stages: the pre-purchase stage, the service implementation, and the post-purchase stage.

The period of pre-selection to open a savings deposit account, the perception of demand: practical considerations when you are selecting a bank such as how can this idle money be the safest to earn the highest profit? Which is the most suitable category to invest in? Searching data: figure out the information to invest your idle money. Which bank should you select if you decided to open a savings account? Why choose this bank to deposit and not another bank? Banking evaluation and selection: the subjective perception of the customer has a significant impact on the bank selection to open a deposit account(Vuong et al., 2020). Although customer growth rate affected by different factors, such as; interest rate, bank promotion, etc. their effect on deposit growth rate if very critical. Depend on the above theoretical review the following research hypothesis has been developed.

H4: customer growth rate has a significant impact on Deposit growth of Ethiopian private commercial Banks

E. Life expectancy rate

Life expectancy refers to the number of years a person is expected to live based on the statistical average. In mathematical terms, life expectancy refers to the expected number of years remaining for an individual at any given age(Mandal, 2014).

According to Mandal (2014) life expectancy for a particular person or population group depends on several variables such as their lifestyle, access to healthcare, diet, economic status and the relevant mortality and morbidity data. However, as life expectancy is calculated based on averages, a person may live for many years more or less than expected.

The expected duration of retirement rises as the survival rate increases. Thus, individuals will consume less and save more during their working years in order to support more expected years of consumption and greater dis-saving during retirement.

The life cycle theory of saving and consumption also predicts that utilization in a specific period, and in this way the decision to save, depends on expectations about lifetime income. According to this hypothesis, the lifetime of a person is divided into the working period and retirement period. People are expected to be net savers during the working period and dissever during the retirement period. In the light of that, the growth of life expectancy rate will increase the total savings rate, since it increases. The lifetime profit and investment funds of younger age groups relative to older age groups.

H5: life expectancy rate has a significant impact on Deposit growth of Ethiopian private commercial Banks

F. Capital adequacy

Capital plays a vital role in enhancing banks' performance and ensuring its continued corporate existence since adequate capital will impel the bank towards effectiveness and efficiency as well as diversification of its assets. It ensures the security of customers deposit, secures the shareholder's fund, improves public confidence and guarantees the regulatory authorities that the financial system is secure.

Capital adequacy is evaluated on the basis of capital adequacy ratio (CAR), which demonstrates the internal strength of the bank to withstand losses when calamity strikes. "Higher Levels of equity would decrease the cost of capital, leading to a positive impact on bank Mobilization of deposit(Zewde et al., 2018).

The capital adequacy ratio (CAR) is a measurement of a bank's available capital expressed as a percentage of a bank's risk-weighted credit exposures. The capital adequacy ratio, also known as capital-to-risk weighted assets ratio (CRAR), is used to protect depositors and promote the stability and efficiency of financial systems around the world(Nkechi & Oluchi).different literature use different measurement to measure capital adequacy of bank.

For example, Vodová (2011), measure capital adequacy as the ratio of total capital of the bank to its total asset. On the other hand, According Firdawek (2019), capital adequacy measured as the ratio of capital of the bank to its loan and advance. Based on the definition of capital adequacy ratio provided above the second formula is proxy for measuring capital adequacy of bank. So, the researcher used capital to loan and advance ratio to measure capital adequacy of private commercial bank.

The study conducted by Zewde et al. (2018)concluded that, capital adequacy has positive and significant effect on deposit growth of private commercial bank

The other studies concluded that capital adequacy has negative and insignificant effect on deposit growth of private commercial bank. For example.

The studies conducted by Firdawek (2019); Jembere (2014) and Dereje (2017) Capital adequacy has negative and statistically insignificant impact on Bank's deposit. Based on the above literatures the researcher of this study draws the following hypothesis.

H6: capital adequacy has a significant impact on Deposit growth of Ethiopian private commercial Banks

G. Profitability

Profitability is ability of a company to use its resources to generate revenues in excess of its expenses. In other words, this is a company's capability of generating profits from its operation. Banks's profitability can be measure in different way, some literatures use return on asset, some literatures also use return on equity and others use interest rate margin to measure profitability of private commercial bank.in order to know the profitability of the bank from its own capital the researcher used return on equity for measuring profitability of private commercial banks in Ethiopia.

According to Erna and Ekki (2004), there is long run relationship between commercial banks deposit and the profitability of the banks. Their co-integration test indicates that the number of

Islamic bank's branch offices and profit-sharing rate are significantly affects the volume of modaraba deposit in Indonesia in the long run.

The other studies conducted by Dereje (2017); Firdawek (2019)shows that, profitability has positive and statistically insignificant impact on Bank's deposit. they also furfur explain as a positive sign of the coefficient indicates a directly relationship between profitability and banks deposit.

On the other hand, the regression result of Tenaye (2019)shows that, profitability has a significant and Negative impact on private commercial bank deposit growth. Based on the majority ligature discussed above the researcher develop hypothesis as follow.

H7: Profitability has a significant impact on Deposit growth of Ethiopian private commercial Banks

2.6. Conceptual Framework of the study

According to Camp (2001)conceptual framework is a structure which the researcher believes can best explain the natural progression of the phenomenon to be studied.

Conceptual framework is a diagrammatic presentation of the relationship between dependent and independent variables Mugenda and Mugenda (2003) In this study, the dependent variable deposit growth rate while the independent variables are the determinants of deposit growth rate. The study will have eight independent factors determining the deposit growth of private commercial banks in Ethiopia.

Those factors are capital adequacy, profitability, life expectancy rate, deposit interest rate, customer growth rates, branch expansion rate and GDP growth rate. The Conceptual framework of these variables is a guide to the research and shows how they determine deposit growth of private commercial banks in Ethiopia. This conceptual frame work can be elaborate using the following diagram.

Figure 2-1 conceptual framework
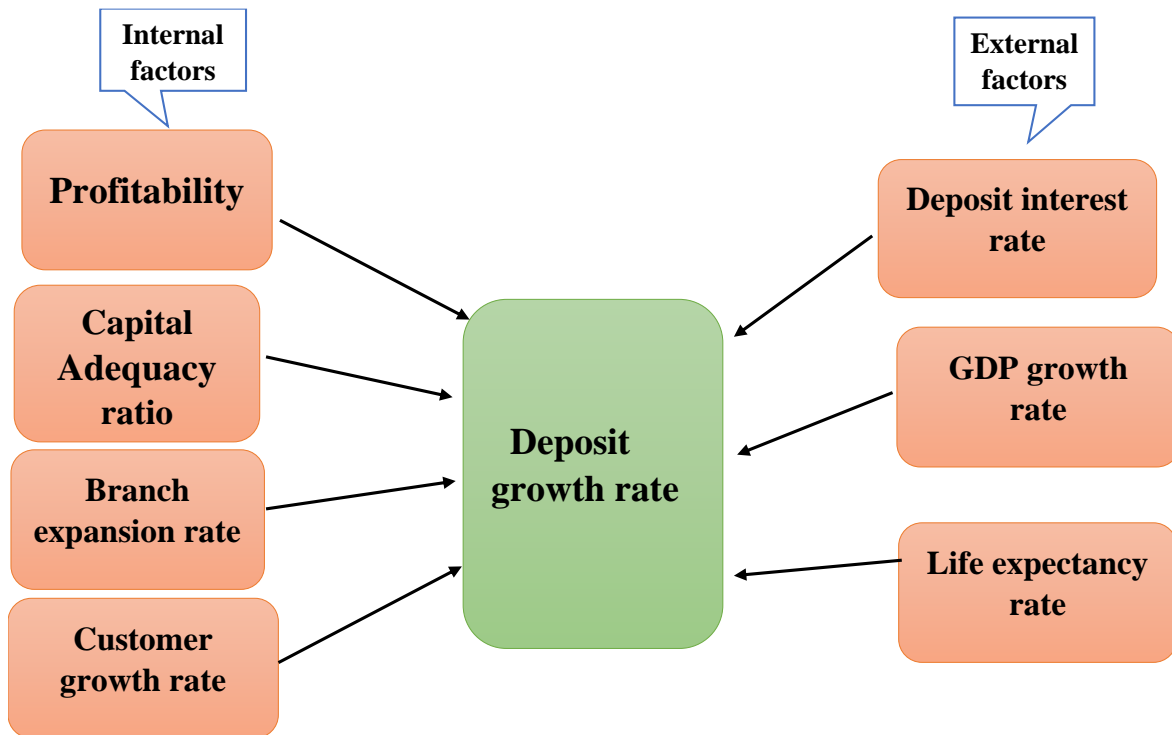
Source; - Author's own formulation from theoretical and empirical literature

CHAPTER THREE: RESEARCH DESIGN AND METHODOLGY

3. Introduction

This chapter contains the research approach, research design, sampling technique, typed of data, methods of data collection, method of data analysis, notation, and expected signs of the variables. Generally, it demonstrates all procedures employed in determining the factors affecting deposit growth of private commercial banks in Ethiopia.

3.1. Research philosophy

According to Creswell (2009) there are four knowledge claim or worldwide view. Those are Positivism, Constructivism, Advocacy/participatory and Pragmatism. Positivism knowledge claim or philosophy hold a deterministic philosophy in which causes probably determine effects or outcomes. Thus, the problems studied by positivist reflect the need to identify and assess the causes that influence outcomes. The main objective of this study was to examine factors which affect deposit growth of private commercial banks of Ethiopia. Due to this positivism knowledge claim was more appropriate for this study.so in order to determine the effect of variables (capital adequacy, profitability, life expectancy rate, deposit interest rate, customer growth rates, branch expansion rate and GDP growth rate) on deposit growth of Ethiopian private commercial banks positivism knowledge claim would be employed.

3.2. Research approach

The choice of research approach depends on objectives that the researchers want to achieve. There are three types of research approach. Namely, qualitative research approach, quantitative research approach and mixed research approach.

Qualitative research is a means for exploring and understanding the meaning individuals or groups ascribe to a social or human problem. The process of research involves emerging questions and procedures, data typically collected in the participant's setting, data analysis inductively building from particulars to general themes, and the researcher making interpretations of the meaning of the data(Creswell, 2009).

Quantitative research is a means for testing objective theories by examining the causal relationship among variables. These variables, in turn, can be measured, typically on instruments, so that numbered data can be analyzed using statistical procedures(Creswell, 2009).

Mixed methods research is an approach to inquiry that combines or associates both qualitative and quantitative forms. It involves philosophical assumptions, the use of qualitative and quantitative approaches, and the mixing of both approaches in a study(Creswell, 2009).

Since the objective of this study is to examine the causal relationship between deposit growth and its factors (capital adequacy, profitability, life expectancy rate, deposit interest rate, customer growth rates, branch expansion rate and GDP growth rate), quantitative research approach would be employed.

3.3. Research design

Research design is a comprehensive plan for data collection in an empirical research project. It is a "blueprint" for empirical research aimed at answering specific research questions or testing specific hypotheses(Bhattacherjee, 2012).

According toSreejesh, Mohapatra, and Anusree (2014) there are three types of research design. These are descriptive research design, exploratory research design and causal(explanatory) research design. Descriptive Research Design is the method of collecting information by asking a set of pre-formulated questions in a predetermined sequence in a structured questionnaire to a sample of individuals drawn. The main aim of exploratory research is to identify the boundaries of the environment in which the issues, opportunities or situations of interest are likely to reside and to identify the silent factors or variables that might be found there and be of relevance to the research. In Causal(explanatory)research design, the basic aim is to identify the cause-and-effect relationship between variables. The causal analysis is the process of determining how one variable influences the change in another variable. In order to determine the effect of factors (capital adequacy, profitability, life expectancy rate, deposit interest rate, customer growth rates, branch expansion rate and GDP growth rate) on deposit growth of private commercial banks of Ethiopia, causal(explanatory) research design was used.

3.4. Target population

The target population of the study were all private commercial banks which established and operate in Ethiopia. There are seventeen private commercial banks which are on operation.

3.5. Sample Size and Sampling Techniques

The study covered all private commercial banks which are established and operate in Ethiopia and also have a minimum of ten years of financial data at the time of data collection on variables desired to investigate. According to Adams, Khan, Raeside, and White (2007),non-probability sample that conforms to certain criteria is called purposive sampling. Purposive sampling is also called judgment sampling in which the sample members are chosen only on the basis of the researcher's knowledge and judgment. Since out of seventeen private commercial banks of Ethiopia the following ten private commercial banks have the age of ten years and above. That means ten years of financial data can be available for the study. This is the reason why researcher used a purposive sampling technique to select those ten private commercial banks of Ethiopia

Table 3-1: List of sampled private banks

No	Name of banks	Bank Address	License Date G.C.	Sector
1	Awash international Bank	Ethiopia	1994	Banking
2	Dashen Bank	Ethiopia	1995	Banking
3	Bank of Abyssinia	Ethiopia	1996	Banking
4	Wegagen Bank	Ethiopia	1997	Banking
5	United Bank	Ethiopia	1998	Banking
6	Nib International Bank	Ethiopia	1999	Banking
7	Cooperative Bank of Oromia	Ethiopia	2004	Banking
8	Lion International Bank	Ethiopia	2006	Banking
9	Zemen Bank	Ethiopia	2006	Banking
10	Oromia International Bank	Ethiopia	2008	Banking

Source national bank of Ethiopia

3.6. Type and Source of Data

According to Adams et al. (2007), data are the facts and figures collected for records or any statistical investigation. As per Kothari (2004), researchers should keep in mind two types of data viz., primary and secondary data. The primary data are those which are collected afresh and for the first time, and thus happen to be original in nature. The secondary data, on the other hand, are those which have already been collected by someone. In this study, the researcher used secondary data.

3.7. Method of data collection

The methods of collecting primary and secondary data differ. since primary data are to be originally collected, while in case of secondary data the nature of data collection work is merely that of compilation. Secondary data may either be published data or unpublished data. Usually published data are available in various publications of the central, state, and foreign governments, and also, they may available in technical and trade journals, books, magazines and newspapers, reports and publications of various associations connected with business and industry.

The researcher used a secondary source of data, which collected from the annual report of selected private commercial banks, annual report National Bank of Ethiopia, Central statistics Agency and World Development Indicators (WDI) from the year 2010/11 up to 2019/20G.c.

3.8. Method of data Analysis

To achieve the objectives of the study, the researcher applied both descriptive and inferential analysis based on Ten Years (20010/11-2019/20) panel data. multiple regression model and fixed effect estimation technique was applied. The following are assumptions of multiple regression model. Linearity, all independent variables are unrelated with error term, observation of error term are unrelated each other, the error term has constant variance, the error term is normally distributed. The multiple regression results were presented in a tabular form and are evaluated using individual statistical significance test (T-test) and overall statistical significance test (F-test). The goodness of fit of the model was tested using the coefficient of determination (R-squared).

3.9. Research Variables

The dependent variable in this study was deposit growth rate and the independent variables of this study were capital adequacy, life expectancy rate, deposit interest rate, customer growth rates, RGDP growth rate, branch expansion rate and profitability.

Table 3-2:Description of the variables, their expected relationship and Sign

Variable	Symbol	Measurement	Expected Sign
Deposit Growth rate	DGR	Deposit growth rate of bank n at time t	
Branch expansion rate	BR	Percentage change of branch for bank n at time T	+
Deposit Interest Rate	IR	Minimum deposit interest rate set by national bank of Ethiopia at time t,	+
RGDP growth rate	GDP	The percentage change of real Gross Domestic Product of Ethiopia	+
customer growth rate	CGR	Percentage Change in customer of bank n at time T	+
Life expectancy rate	LER	The country's life expectancy rate at time T	+
Profitability	RE	Return on equity of bank nt	+
Capital adequacy	Cap	The ratio of capital of bank nt to loan and advance of bank nt	+

Source; - Author's own formulation from theoretical and empirical literature

3.10. Model specification

As concluded from the literature review part, the deposit growth of private commercial banks is determined by two factors. Such as: - factors related to the economy of the country (External factors) and bank-related factors (Internal factors). Thus, this study aims to examine the effect of those factors on deposit growth of private commercial banks through the use of historical

secondary data collected from the national bank of Ethiopia, central statistical agency, and world bank data. Similar to previous studies, a linear regression model was used to capture the historical effect of different quantitative factors on banks' deposits. To be able to apply the linear regression model, all the factors should be stationary and the residuals should be homoscedastic and not autocorrelated.

Therefore, the regression model was specified as follow.

$$DGR_{nt} = \alpha + \beta 1 * BR_{nt} + \beta 2 * IR_{nt} - \beta 3 * GDP_{nt} + \beta 4 * LER_{nt} - \beta 5 * RE_{nt} + \beta 6 * CGR_{nt} + \beta 7 * CAP_{nt} + \varepsilon_{nt}$$

DGR = Deposit growth rate

α = Coefficient of constant term

$\beta 1$ = Coefficient of branch expansion rate

$\beta 2$ = Coefficient of interest rate

$\beta 3$ = Coefficient of real GDP growth rate

$\beta 4$ = Coefficient of life expectancy rate

$\beta 5$ = Coefficient of Return on equity

$\beta 6$ = Coefficient of customer growth rate

$\beta 7$ = Coefficient of capital adequacy

n = 1…2…10 (Private commercial banks of Ethiopia)

t = 1…2…10 years (2010/11---2019/20 years)

ε = the error term

CHAPTER FOUR:DATA ANALYSIS AND INTERPRETATION

4. Introduction

This chapter deals with the results and discussion of the findings. The chapter had three sections. The first section presents a descriptive analysis of the study. The second section presents the choice between the fixed effect model and the random effect model. At last, the chapter presents the diagnostics test results of multicollinearity, heteroscedasticity, autocorrelation, and normality. The data was analyzed based on EViews version 10 software

4.1. Descriptive statistics

The dependent variable used in this study was bank deposit growth rate, and the explanatory variables were capital adequacy, profitability, life expectancy rate, deposit interest rate, customer growth rates, branch expansion rate and GDP growth rate.

Table 4-1: Summary of descriptive statistics

	DGR	BR	CGR	CAP	GDP	IR	LER	RE
Mean	0.313	0.259	0.270	0.289	0.094	0.056	0.009	0.229
Median	0.270	0.236	0.228	0.255	0.095	0.050	0.008	0.219
Maximum	0.859	0.760	0.782	0.786	0.114	0.070	0.016	0.424
Minimum	0.052	0.024	0.029	0.051	0.077	0.050	0.005	0.027
Std. Dev.	0.173	0.147	0.170	0.126	0.012	0.009	0.004	0.074

Source: EViews10 output results 2021

As shown in Table 4.1 above, the mean value of the private commercial bank, deposit growth rate was 31.3 percent for the period of 2010-2019. This implies that, private commercial banks were achieved 31.3 percent of average deposit growth rate during the given period of time. It was additionally noticed that the bank deposit growth was fluctuating between 5.2 and 85.9 percent. The standard deviation for the bank's deposit growth was 17.3 percent. This confirms that there

were low varieties of deposit growth among private CBs during the study period. Because the standard deviation for the bank's deposit growth was below the mean

The mean value of customer growth rate was 27 percent and there was medium dispersion of customer growth rate its mean value among banks that is shown by the standard deviation of 17 percent and the maximum value of customer growth rate was 78.2 percent which was very far above the standard whereas the minimum value was 2.9 percent, which was also far below the standard. This indicates that there were some commercial banks in Ethiopia having higher customer growth rate and there were some banks having lower deposit growth rate around 2.9 percent. This may result from lack of awareness, limited accessibility of the bank to the major public of the county.

The average value of life expectancy rate of Ethiopia was around 0.9 percent and the standard deviation for life expectancy rate was 0.4 percent, this implies that there was also little volatility of each observation of life expectancy rate from its mean value during 2010-2019. The maximum and minimum value of life expectancy rate for the last ten years was 1.6%and 0.5 % respectively.

The average value of branch expansion rate of those the sampled private commercial banks for the last ten years was 25.9% and the standard deviation of 14.7%. This indicates that there were minimum variations of each observation from its mean value of branch expansion rate. The maximum branch expansion rate was 76 percent which was occurred in 2018 by Zemen bank while the minimum branch expansion rate was of 0.024 or 2.4% was occur in 2019 by Dashen bank.

The mean value of GDP growth rate of Ethiopia was around 9.4 percent and the standard deviation for GDP growth rate was 1.2 percent, this implies that there was also little volatility of each observation of GDP growth rate from its mean value during 20010-2019. The maximum and minimum value of GDP growth rate for the last ten years was 11.4%and 7.7 % respectively.

Profitability is ability of a company to use its resources to generate revenues in excess of its expenses. In other words, this is a company's capability of generating profits from its operations.

In this study banks profitability was measured using return on equity. The average value of return on equity was recoded as 22.9 percent. The standard deviation was 7.4 percent which was far from the mean. That means there was less volatility on return on equity among those sampled commercial banks. The maximum and the minimum amount of return on equity were 42.4 percent

and 2.7 percent. the maximum return on equity was recorded by Zemen bank in 2012 and the minimum value of return on equity was recorded by cooperative bank of Oromia in 2016.

The average value of capital adequacy ratio was 0.298 and the standard deviation of 0.126 This indicates that there was little variation of each observation from its mean value of capital adequacy ratio. The maximum capital adequacy ratio was 0.786 which was occurred in 2018 by wegagen bank while the minimum capital adequacy ratio was of 0.051 was occurred in 2016 by cooperative bank of Oromia.

Finally, as the above table portrays the average, the minimum and the maximum deposit interest rate was 5.6 %, 5%, 7% respectively and its standard deviation was 0.9 percent. The volatility of interest rate was very minimal. This shows that the was government control on interest rate, so those private banks may not compete through interest rate.

4.2. Trend Analysis

Figure 4-1 Trend Analysis
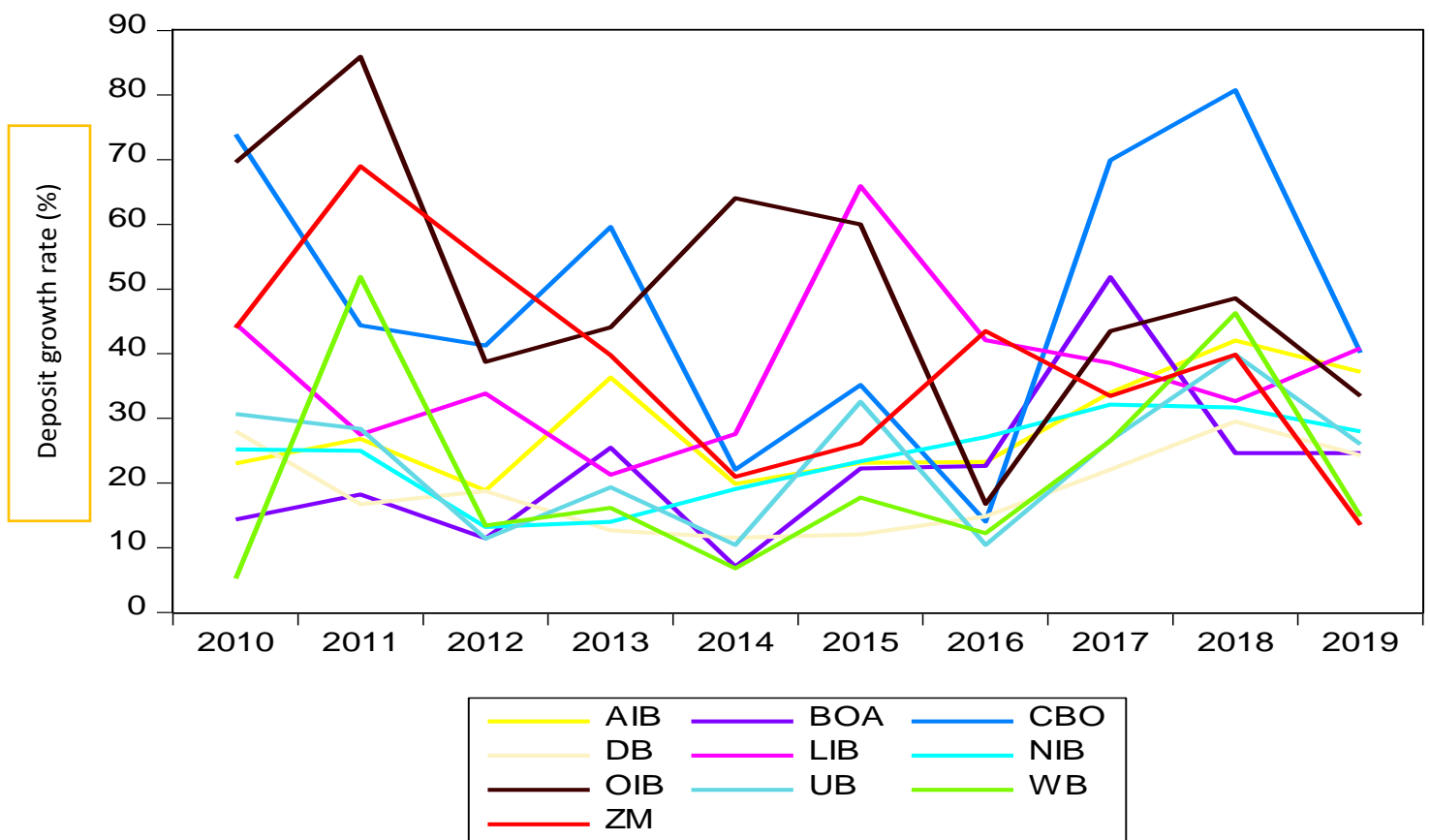
Source: EViews10 output results 2021

From 2010-2011 deposit growth rate of wegagen bank, Zemen bank, and Oromia international bank increased at an increasing rate, due to the increasing of branch expansion rate and customer growth rate. During the same period, the deposit growth of lion international bank, Dashen bank, and cooperative bank of Oromia was decreasing at an increasing rate. The reason was decreasing of customer growth rate and GDP growth rate. The deposit growth rate of the remaining sampled banks during this period has no significant change.

From the year 2011-2012 except the deposit growth rate of lion international bank, Dashen bank, and cooperative bank of Oromia, the deposit growth rate of all banks shows decreasing. The common reason for this decrease in deposit growth rate was the capital adequacy ratio.in this period the capital adequacy ratio of those banks was decreased.

From the year 2012-2013 except the deposit growth rate of lion international bank, Dashen bank, and Zemen bank, the deposit growth rate of all sampled private banks shows increment. due to an increase in customer growth rate, capital adequacy ratio, and GDP growth rate. The reason for the decreasing the deposit growth rate of lion international bank, Dashen bank, and Zemen bank was decreasing in branch expansion rate.

From 2013-2014 the deposit growth rate of lion international bank and Oromia international shows increasing. Because of increasing in branch expansion rate and profitability respectively. in the same period, the deposit growth rate of Awash international bank, Zemen bank, cooperative bank of Oromia, bank of Abyssinia, wegagen bank, and united bank shows decreasing. This was due to decreasing customer growth rate. The deposit growth rate of Dashen bank and nib international bank shows stagnant.

From the year 2014-2015 except the deposit growth rate of Oromia international bank and Dashen bank, the deposit growth rate of all sampled private banks shows increasing. The reason behind this was increasing in customer growth rate during the period. The deposit growth rate of Oromia international bank shows decreases at decreasing rate due to decrease in branch expansion rate, customer growth rate and capital adequacy ratio.

From 2015-2016 only deposit growth rate of Zemen bank shows increasing at an increasing rate due to an increase in branch expansion rate, customer growth rate, and capital adequacy ratio. Deposit growth rate of bank of Abyssinia, awash international bank, nib international bank and

Dashen bank shows almost stagnant. And, Deposit growth rate of the remaining sampled banks shows decreasing due to decreasing customer growth rate, branch expansion rate, and capital adequacy ratio.

From the period 2016-2017 2015 except the deposit growth rate of Zemen bank and lion international bank, deposit growth rate of all private commercial banks shows increasing. The reason behind this was an increase in profitability and customer growth rate. the reason for the decreasing deposit growth rate of Zemen bank and lion international bank also decrease in profitability and customer growth rate.

From 2017-2018 the deposit growth rate of Zemen bank and Oromia international bank seems stagnant and deposit growth of bank of Abyssinia shows decreasing due to decreasing in profitability and branch expansion rate. Deposit growth rate of the remaining private commercial banks was similar to the previous year.

From the year 2018-2019 except the deposit growth rate of bank of Abyssinia, deposit growth rate of all private commercial banks shows decreasing. The common reasons behind this were decreasing in profitability, branch expansion rate, and capital adequacy ratio. The deposit growth rate of bank Abyssinia shows stagnant at this period. This was due to not a significant change in branch expansion rate and profitability of the bank.

Generally, based on figure 4.1, the trend of deposit growth of private commercial banks of Ethiopia shows ups and downs. Which means in some period there was high deposit growth rate and, in some period, there was low deposit growth rate recorded by each sampled private banks. This was due to the increasing or decreasing of some explanatory variables such us: -customer growth rate branch expansion rate capital adequacy ratio and profitability of each sampled private banks.

4.3. Correlation Matrix

Correlation is degree in which two or more variables are related to each other. The sample size is the basic component to decide whether or not the relationship coefficient is distinctive from zero/statistically critical. The values of the relationship coefficient are always between -1 and +1. A relationship coefficient of +1 demonstrates that the two factors are perfectly related in a positive linear form; whereas a relationship coefficient of -1 shows that two factors are perfectly related in a negative direction. A relationship coefficient of 0, on the other hand demonstrates that there's no direct relationship between two variables (Brooks, 2008). The following table predicts the likely relationship among variables within the study.

Table 4-2: correlation matrix

Correlation Analysis: Ordinary
Date: 06/13/21   Time: 00:35
Sample: 2010 2019
Included observations: 100

Correlation	DGR	CAP	CGR	BR	GDP	IR	LER	RE
DGR	1.000							
CAP	0.330	1.000						
CGR	0.608	0.030	1.000					
BR	0.189	0.353	0.043	1.000				
GDP	-0.157	0.086	0.001	0.081	1.000			
IR	0.176	-0.180	0.058	-0.251	-0.587	1.000		
LER	0.039	0.315	0.029	-0.013	0.586	-0.676	1.000	
RE	0.043	-0.024	-0.284	-0.066	0.062	-0.135	0.252	1.000

Source; eview10 software 2021

The correlation matrix within the above table 4.2. demonstrate that a positive relationship between deposit growth rate (dependent variable) and explanatory factors (branch expansion rate, customer growth rate, life expectancy rate, return on equity and interest rate). on the other hand, there was a negative relationship between deposit growth rate and the explanatory variables GDP growth rate.

4.4. Testing for stationary

Unit root tests are tests for stationarity in a time arrangement. A time arrangement has stationarity if a shift in time doesn't cause a change in the shape of the distribution; unit-roots are one cause for non-stationarity.

Applications of panel unit root tests have become commonplace in empirical economics, yet there are ambiguities as how best to interpret the test results(Pesaran, 2012)

In this study the researcher used Levin, Lin & Chu method to test whether there was unit root or not. According to this test method, the acceptance of the null hypothesis recommended that there is a common unit root. On the other way, the acceptance of the alternative hypothesis indicates that unit root does not exist.

Ho: There is unit root in the model.

H1: There is stationary in the model.

The logarithm value of the panel data of deposit growth rate was taken before Ordinary Least Square (OLS) techniques are used for estimating a model. The logarithm is used in the model in order to transform the nonlinear data into linear form.

Table 4-3: unit root test

Variable	Method	Unit root at	Statistic	Prob.**
Logdgr	Levin, Lin & Chu t*	Level	-4.31203	0.000
Cgr	Levin, Lin & Chu t*	Level	-3.43021	0.000
Gdp	Levin, Lin & Chu t*	Level	-10.6007	0.000
Ler	Levin, Lin & Chu t*	Level	-4.94614	0.000
Re	Levin, Lin & Chu t*	Level	-3.16247	0.000
CAP	Levin, Lin & Chu t*	Level	-1.87862	0.030
Br	Levin, Lin & Chu t*	Level	-6.00533	0.000
Ir	Levin, Lin & Chu t*	2nd difference	-4.75549	0.000

Source; eview10 software 2021

Table 4.3 displayed the results of Levin, Lin & Chu panel unit root test. It is shown that the logarithm form of deposit growth rate, customer growth rate, capital adequacy life expectancy rate, return on equity, GDP growth rate and branch expansion rate were stationary at level. Whereas,

interest rate was stationary at second difference. Here it is observed that the probability values of t statistic for all the variables are very low and accordingly the null hypothesis is rejected for all variables at 5% level of significance. Therefore, the results of the Levin, Lin & Chu test suggested that all the variables are stationary.

4.5. Fixed effect vs random effect model test

According to Firebaugh, Warner, and Massoglia (2013) there are two commonly used models. Namely fixed effect model and random effect model.

Fixed effect model

Fixed effects models provide a way to estimate causal effects in analyses where units (individuals, schools, neighborhoods, etc.) are measured repeatedly over time. The beauty of the fixed effects method is that it can eliminate the effects of confounding variables without measuring them or even knowing exactly what they are, as long as they are stable over time(Firebaugh et al., 2013).

Random effect model

The random effects approach treats the above individual-specific effect as randomly varying, whereas the fixed effects approach treats it as fixed for each individual. The usual assumption of the random effects model is that "μ" has a zero mean and constant variance and that it is independent of the Xs and of "its εit(Firebaugh et al., 2013). To decide which estimator to best connected for this model, the random effects- Hausman test was employed. If the probability value (p value) for Hausman test greater than alpha of 0.05, the Hausman test will be statistically insignificant, and the null hypothesis will be accepted in favor of the alternative. Accepting the null hypothesis implies that the random effects estimator will be apply to the model, the inverse is also true.

Ho; random effect model is appropriate

H1; fixed effect model is appropriate

Table 4-4 : Hausman test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	26.18	7	0.0005

Source; Stata output 2021

In the above table 4.4 indicate that the Chi- Sq. statistics for Hausman test is 26.18 and the probability value (p-value) is 0.0005, which is less than alpha value of 0.05. this indicates that p-value for Hausman test is statistically significant. Therefore, reject the null hypothesis which, says random effect model is appropriate. This indicates that individual effects in the model are fixed.

4.6. Model Diagnostic test

In this study as specified in chapter three diagnostic tests were carried out to ensure that the data fits the fundamental assumptions of a classical linear regression model. Consequently, the results for model misspecification tests are displayed as follows:

4.6.1. Test for normality

The classical normal linear regression model assumes that each ui is distributed normally with zero Mean and constant variance (Damodar N, 2004). There are several methods of assessing whether data are normally distributed or not. Among those methods the researcher used Jarque-Bera test due its well-knowingness. according this method, If the probability value (p value) for Jarque-Bera test less than alpha of 0.05, the Jarque-Bera test will be statistically significant, and the null hypothesis will be rejected in favor of the alternative. Rejecting the null hypothesis implies that, the residuals are not normally distributed, the inverse is also true. The following are the two hypotheses for this test.

Ho: The residuals are normally distributed

H1: The residuals are not normally distributed

The researcher performed normality test using eview10 software as follow

Figure 4-2: normality test for residuals
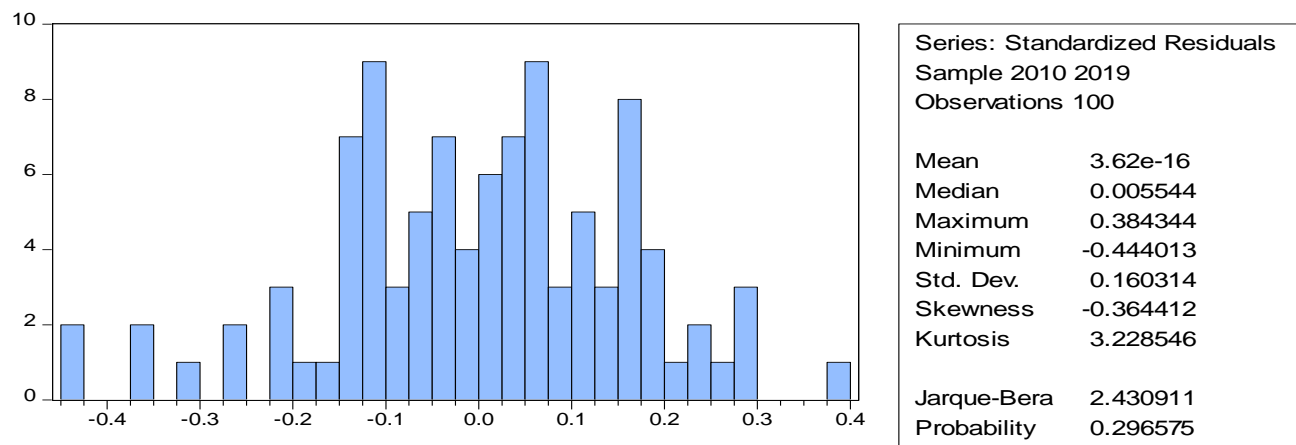
Source eview10 software 2021

Based on the above figure the normality test of this study shows, the probability value (p value) for Jarque-Bera test greater than alpha value of 0.05, its skewness is between -1 and +1, and its kurtosis is close to 3, this shows the residuals were normality distributed.

4.6.2. Test for heteroscedasticity

The homoskedasticity assumption of classical regression model states that, the variance of the unobserved error, u, conditional on the explanatory variables, is constant. Homoskedasticity fails whenever the variance of the unobserved factors changes across different segments of the population, where the segments are determined by the different values of the explanatory variables(Wooldridge, 2015).even if there are numerous of methods to detect the existence of heteroscedasticity, the researcher used Breusch-Pagan-Godfrey test.

Ho: There is no heteroscedasticity in the model
H1: There is heteroscedasticity in the model

Table 4-5: Heteroskedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.881015	Prob. F (7,92)	0.525
Obs*R-squared	6.282249	Prob. Chi-Square (7)	0.507
Scaled explained SS	5.924920	Prob. Chi-Square (7)	0.549

Source; eview10 software 2021

As displayed in the above on table 4.5. both the F-statistic and Prob. Chi-Square test statistics provided the same conclusion that, there is no significant evidence for the existence of Heteroscedasticity The F-statistic Prob. Value of 0.525 and the Prob. Value Chi-Square 0.507 Indicate that, there was homoscedasticity in the model. Since the p-values in all of the cases were over 0.05, the null hypothesis of homoscedasticity is failed to reject at 5 percent of significant level.

4.6.3. Test for Multicollinearity

The term multicollinearity refers to the existence of a "perfect," or exact, linear relationship among some or all explanatory variables of a regression model (Damodar, 2004). classical Linear regression analysis assumes that, there is no perfect or exact relationship among exploratory variables. In regression analysis, when this assumption is violated, the problem of Multicollinearity occurs.

Ho: There is no Multicollinearity in the model

H1: There is Multicollinearity in the model

The result of the test for presence multicollinearity between independent variable is displayed as follow.

Table 4-6: multicollinearity test

Variable	VIF	1/VIF
LER	2.86	0.350
IR	2.43	0.412
GDP	1.75	0.572
BR	1.40	0.713
CAP	1.40	0.715
RE	1.22	0.822
CGR	1.13	0.887
Mean VIF | 1.74		

Source Stata version14 output 2021

According to Daoud (2017),in order to say no multicollinearity among explanatory variables variance inflation factor should be less than 10 and tolerance value should be greater than 0.1 or 10%.

based on the above benchmark the maximum variance inflation factor was 2.86 And the minimum tolerance value was 0.350 additionally the average variance inflation factor was 1.74, which was very minimal. This indicate that there was no multicollinearity problem among explanatory variables.

4.6.4. Test for Model Specification: - Ramsey Reset Test

In statistics, the Ramsey Regression Equation Specification Error Test (RESET) test is a general specification test for the linear regression model. More specifically, it tests whether non-linear combinations of the fitted values help explain the response variable. The intuition behind the test is that if non-linear combinations of the explanatory variables have any power in explaining the response variable, the model is mis specified in the sense that the data generating process might be better approximated by a polynomial or another non-linear functional form(Ramsey, 1974). Ramsey Reset test is also known as a test for model specification. since, it is helpful to test whether there are or not any overlooked factors within the model.

Ho: There is no misspecification in the model

H1: There is misspecification in the model

The following table shows Ramsey Reset Test for model specification.

Table 4-7: Ramsey Reset Test

Ramsey RESET Test			
Equation: UNTITLED			
Specification: LOGDGR C BR CGR IR LER GDP CAP RE			
Omitted Variables: Squares of fitted values			
	Value	Df	Probability
t-statistic	1.590609	91	0.115
F-statistic	2.530036	(1, 91)	0.115
Likelihood ratio	2.742312	1	0.098

Source; eview10 software 2021

As presented in the above table the probability value of t-statistic, F-statistic And Likelihood ratio were insignificant. which were 0.115, 0.115 and 0.098 respectively. This implies that fail to reject the null hypothesis which says There is no misspecification in the model or there is omitted variable in the model. From this we conclude that, the model was correctly specified or there was no specification error in the model.

4.6.5. Test for Serial correlation

The term autocorrelation can be defined as "correlation between members of observations ordered in time (as in time series data) or space as in cross-sectional data(Gujarati & Porter, 1999).

Serial correlation (also called Autocorrelation) is where error terms in a time series transfer from one period to another. In other words, the error for one time period is correlated with the error for a subsequent time period. The researcher used Breusch–Godfrey LM test for testing the existence of serial correlation with in error terms.

The Breusch–Godfrey test is a test for autocorrelation in the errors in a regression model. It makes use of the residuals from the model being considered in a regression analysis, and a test statistic is derived from these.

Ho: There is no serial correlation with in errors term in the model

H1: There is serial correlation with in errors in the model.

Table 4-8: Breusch-Godfrey Serial Correlation LM Test:

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	2.604618	Prob. F (2,91)	0.080
Obs*R-squared	5.471355	Prob. Chi-Square (2)	0.065

source; eview10 software 2021

Based on the preceding table the Breusch-Godfrey Serial Correlation LM Test of F-statistic prob. Value was 0.080 and its prob. of chi-square was 0.065. this indicates that the absence of serial correlation with in errors term in the model. So, fail to reject null hypotheses which says, there is no serial correlation with in errors term in the model.

4.7. Results of Regression Analysis

Table 4.9 shows the regression results of multiple linear regression model which examine the impact of firm-specific factors and macroeconomic factors on the deposit growth (as measured by banks deposit growth rate) of private commercial bank in Ethiopia.

The analysis was based on the data collected from annual financial report of each sampled private commercial Bank of Ethiopia, world bank data and national bank of Ethiopia annual report. The relationship between one dependent variable and six independent variables was regressed using econometric software called EViews 10.

Multiple linear regression model used to estimate the statistically significant determinants of Ethiopian private commercial bank's deposit growth was:

$logDGR_{nt} = \alpha_i + \beta_1*BR_{nt} + \beta_2*IR_{nt} - \beta_3*GDP_{nt} + \beta_4*LER_{nt} - \beta_5*RE_{nt} + \beta_6*CGR_{nt} + \beta_7*CAP_{nt} + \mathcal{E}_{nt}$

where as

$logDGR_{nt}$ = logarithm of deposit growth rate

αi = Coefficient of constant term

$\beta 1$ = Coefficient of branch expansion rate

$\beta 2$ = Coefficient of deposit interest rate

$\beta 3$ = Coefficient of real GDP growth rate

$\beta 4$ = Coefficient of life expectancy rate

$\beta 5$ = Coefficient of Return on equity

$\beta 6$ = Coefficient of customer growth rate

$\beta 7$ = Coefficient of capital adequacy

n = 1…2…10 (Private commercial banks of Ethiopia)

t = 1…2…10 years (2010/11---2019/20 years)

ε = the error term

Table 4-9: Regression analysis

Periods included: 10

Cross-sections included: 10

Total panel (balanced) observations: 100

	Variable	Coefficient	Std. Error	t-Statistic	Prob.
	C	-1.272	0.258	-4.920	0.000
	CGR	0.694	0.141	4.919	0.000
	IR	7.822	2.449	3.194	0.002
	GDP	-3.563	1.646	-2.165	0.033
	LER	5.807	6.723	0.864	0.390
	CAP	0.781	0.159	4.909	0.000
	RE	0.475	0.235	2.023	0.046
	BR	0.084	0.123	0.686	0.495
		Effects Specification			
	Cross-section fixed (dummy variables)				
	R-squared	0.726	Mean dependent var		-0.571
	Adjusted R-squared	0.673	S.D. dependent var		0.249
	S.E. of regression	0.142	Akaike info criterion		-0.911
	Sum squared resid	1.676	Schwarz criterion		-0.468
	Log likelihood	62.530	Hannan-Quinn criter.		-0.731
	F-statistic	13.737	Durbin-Watson stat		2.161
	Prob(F-statistic)	0.000			

Source; eview10 software 2021

Based on the above regression result the case and effect relationship among dependent(logdgr) and explanatory variables (br, cgr, cap,gdp,ler,ir and RE) was displayed as follow.

$$LOGDGR = -1.272 + 0.694*CGR + 7.822*IR - 3.563*GDP + 5.807*LER + 0.781*CAP + 0.475*RE + 0.084*BR + \varepsilon_{it}$$

4.7.1. Interpretation of coefficient of determination (R-squared)

As displayed in table 4.9. the R-squared coefficient of 0.726 resulted from the estimated model Demonstrated that 72.6 percent of the variation in the logarithm form of deposit growth rate(logDGR) was explained by the selected explanatory variables such as; branch expansion rate (BR), interest rate (IR), GDP growth rate (GDP), life expectancy rate (LER), customer growth rate (CGR), capital adequacy (CAP) and the return on equity (RE). The remain 27.4 percent of the variation in the dependent variable(logDGR) was explained by other factors which were not included by this model. This indicate that there are number of factors which can explain the above dependent variable and need to be included in the model. The researcher concluded that the majority of the variation in logarithm form of deposit growth rate was explained by the explanatory variables included in the model.

4.7.2. Interpretation the result of the explanatory variables

A. Customer growth rate on deposit growth rate

As explained in chapter three customer growth rate is one of the most important factors of private commercial bank deposit growth. Again, the regression result presented on table 4.9 shows customer growth rate was statistically significant at 5% significant level and has positive impact on bank deposit growth rate. A coefficient of customer growth rate 0.694 implies, a one unit increase in customer growth rate leads to a 0.694 unit increase in deposit growth rate. As per the knowledge of the researcher, there is no supportive or contradictive literature for this result. Because this variable is the researcher's newly added variable.

This study proof the hypothesis developed in chapter two which said, "customer growth rate has a significant impact on the deposit growth of Ethiopian private commercial banks.

B. Deposit Interest rate on deposit growth rate

This study found that deposit interest rate has a positive relationship with deposit growth of private commercial banks and the relationship is significant at 5% significant level. Based the model in Table 4.9 above, a one unit increase in deposit interest rate generates 7.822-unit increase in deposit growth of private commercial banks. As a conclusion deposit interest rate significantly contribute to bank deposit growth.

This result is supported by the findings of Boadi et al. (2015); Fekadu (2019); Jibrin et al. (2014); Ongeti (2016); Simeon (2017)which concluded that, deposit interest rate has significant and

positive effect on deposit growth of private commercial banks. On the other way, the result of this study contradict with the finding of Tenaye (2019)that demonstrated as deposit growth rate has negative and significant effect on private commercial bank deposit growth and also, contradict with the finding of Ketema (2017) that explain as deposit interest rate has positive and insignificant effect on deposit growth of private commercial bank.

In general, this study concluded that deposit interest rate has positive and significant effect on deposit growth of private commercial banks of Ethiopia. This implies that deposit interest rate is a major factor in explaining the private commercial bank's deposit growth in Ethiopia. Meaning that, interest rate more plays an important role in deposit growth. In fact, there is competition between private commercial banks in terms of attraction using deposit interest rate. Due to this the study fail to rejected the null hypothesis which says there is a positive and significant relationship between deposit interest rate and deposit growth.

This study proof the hypothesis developed in chapter two which said, "Deposit interest rate has a significant impact on the deposit growth of Ethiopian private commercial banks".

C. GDP growth rate on deposit growth rate

The regression result in table 4.9 indicates that GDP growth rate was statistically significant at 5% significant level and has negative impact on bank deposit growth rate. A one-unit increment in GDP growth rate leads to a 3.563-unit decrement in deposit growth of private commercial banks other things remain constant. This finding was supported by Islam et al. (2019),which concluded that GDP growth has a negative impact on private commercial banks of Bangladesh, In contrast, The regression result of Dereje (2017); Firdawek (2019); Kassa (2017); Morina and Osmani (2019); Samantaraya and Patra (2014); Simeon (2017); Tenaye (2019); Yakubu and Abokor (2020),concluded that GDP growth has positive and significant effect on deposit growth of private commercial banks. This paper found out GDP growth has a negative impact on private commercial banks of Ethiopia. This may happen due to the following reason.

As an increase in GDP growth rate of the county may results, growth the disposal income of individual. Even if the relationship between saving and disposal income is positive, if the increment rate of consumption was greater than the increment rate of disposal income leads to decrease saving by household. When we back to our case the negative relationship between GDP

growth rate and deposit growth rate of the private commercial banks may be due to the above reason.

This study proof the hypothesis developed in chapter two which said, "GDP growth rate has a significant impact on the deposit growth of Ethiopian private commercial banks".

D. Life expectancy rate on deposit growth rate

The regression result displayed in table 4.9 indicate that the explanatory variable life expectancy rate was insignificant at 5% level of significance. Which implies life expectancy rate has positive and insignificant effect on deposit growth of private commercial banks of Ethiopia.

As per the knowledge of the researcher there was no supportive or contradictive literature for this variable, the reason behind is, this variable was newly added variable by the researcher.

This study disproof the hypothesis developed in chapter two which said, "life expectancy rate has a significant impact on the deposit growth of Ethiopian private commercial banks".

E. Capital adequacy on deposit growth rate

The regression result of this study demonstrate that the explanatory variable capital adequacy ratio was statically significant at 5% significant level had positive impact on deposit growth of private commercial banks in Ethiopia. This indicate that a one unit increase in capital adequacy reseals to a 0.781 unit increases in deposit of Ethiopian private commercial banks.

This study supported by the finding of Zewde et al. (2018) that explain as capital adequacy had positive and statistically significant impact on deposit growth of private commercial banks.

According toAguenaou, Lahrech, and Bounakaya (2017) Capital adequacy is the internal strength of a bank that reflects its capacity to face difficulties during the downturns. It ensures the security of customers deposit, secures the shareholder's fund, improves public confidence and guarantees the regulatory authorities that the financial system is secure. Based on the above justification the result of (Zewde et al., 2018) was reasonable.

But , this study contradict with Dereje (2017); Firdawek (2019); Jembere (2014) they connect their justification with the financial fragility crowding out" theories, which predicts that, higher capital reduces liquidity creation and lower capital tends to favor liquidity creation. They stated that,

depositors will be charged a nominal fee for the intermediary service of loaning out their respective deposit.

This study confirms the hypothesis developed in chapter two which said, "capital adequacy has a significant impact on the deposit growth of Ethiopian private commercial banks".

F. Return on equity on deposit growth rate

The result in table 4.9 indicates that Return on equity was statistically significant at 5% significant level and has positive impact on bank deposit growth rate. A one-unit increment in return on equity leads a 0.475 -unit increment in deposit growth of private commercial banks other things remain constant. This result support the argument of Erna and Ekki (2004)which says there is a longer positive relationship between profitability and deposit growth of commercial banks. According to Finger and Hesse (2009)Higher profits is considered as a positive signal or soundness of the bank, which could make it easier for such banks to attract other deposit.

The regression result of this study against the study conducted by Dereje (2017); Fekadu (2019)that demonstrate as profitability has positive and statically insignificant on deposit growth of private commercial banks.

On the other way the study also contradict with the finding of Tenaye (2019) which say profitability has negative and statically significant effect on deposit growth of private commercial bank.

The researcher concludes that there is positive and statistical significant effect of profitability on deposit growth of private commercial banks. This result shows as profitability of banks increase the confidence of depositors to get their money back will increase. This push depositors to deposit the money in deposit financial institution rather than put in home.

This study proof the hypothesis developed in chapter two which said, "profitability has a significant impact on the deposit growth of Ethiopian private commercial banks"

G. Branch expansion rate on deposit growth rate

The result in table 4.9 indicates that bank branch expansion rate was statistically insignificant at 5% significant level and has positive impact on bank deposit growth rate. This result contradict the argument of Islam et al. (2019)which says, bank branch expansion has negative impact on

deposit growth. On the other side This finding supports the result of Dereje (2017); Fekadu (2019); Firdawek (2019); Okere and Ndugbu (2015); Simeon (2017); Sisay (2013); Zewde et al. (2018) which says branch expansion has a positive impact on deposit growth of private commercial banks. But contradict with significant level. The previous supported studies conclude that branch expansion has positive and significant impact on deposit growth. But this study conclude that branch expansion has positive and insignificant impact on deposit growth. Therefore, in general, null hypothesis has been accepted and concluded that bank branches expansion had insignificant impact on the growth of Private commercial banks deposit.

This study disproof the hypothesis developed in chapter two which said, "branch expansion rate has a significant impact on the deposit growth of Ethiopian private commercial banks"

CHAPTER FIVE: CONCLUSION AND RECOMMENDATION

5. Introduction

This chapter deals with the conclusion and recommendation part of the study. It provides a short and precise conclusion about the finding. Additionally, the chapter presents a recommendation for the concerning body and suggestion for further researcher.

5.1. Conclusion

The survival of each private commercial bank of Ethiopia mainly depends on deposit made by loyal customers, because mobilizing deposit for private commercial banks is a matter of survival. Without having sufficient deposit, private commercial banks can't survive as a bank.

The main objective of the study was to examine factors affecting deposit growth of private commercial banks of Ethiopia. Four bank specific explanatory variables (branch expansion rate, customer growth rate, profitability, capital adequacy) and three macroeconomic variables (life expectancy rate, GDPP growth rate, deposit interest rate) were examined to determine their effect on deposit growth of private commercial banks of Ethiopia. Based on the regression analysis, the following conclusion has been provided

- ➢ The regression analysis of this study showed that, except life expectancy rate and branch expansion rate, all explanatory variables have significant effect on deposit growth of private commercial banks.
- ➢ Among those predictor variables which have significant impact on deposit growth, customer growth rate, profitability, capital adequacy and deposit interest rate affect deposit growth of private commercial banks positively. Whereas, the impact GDP growth rate was negative.
- ➢ Based on the regression analysis, both Bank-specific factors and macro-economic factors are important determinant of private commercial banks deposit growth.
- ➢ The study shows that bank which has higher customer growth rate, higher capital adequacy ratio and higher profitability would have higher deposit growth.
- ➢ The trend analysis of this study shows, the amount of deposit balance of each sampled private commercial banks shows ups and downs. Which means in some period of time there was high deposit amount recorded by some private commercial banks and in some

period of time there was low amount of deposit balance recorded by those private commercial banks. This was due to the increasing or decreasing of some explanatory variables such us: -customer growth rate branch expansion rate capital adequacy ratio and profitability of each sampled private banks.

➢ Finally, the researcher concluded that, customer growth rate, deposit interest rate, profitability, GDP growth rate and capital adequacy were the most powerful variables which affect deposit growth rate of private commercial banks in Ethiopia.

5.2. Recommendation

This study examines factors affecting the deposit growth of Ethiopian private commercial banks. Depend on the analysis made and the major finding obtained, the following recommendations were forwarded.

➢ Those sampled private commercial banks should build their image to attract more customers. They should provide excellent services for their customers to mobilize more deposit. Because customer growth rate is one of the most significant variables which affect their deposit growth.

➢ Since the most source of finance for banks is a deposit, those private commercial banks should give more attention and exertion to mobilize their deposit by using their profitability and capital as an instrument. Because profitability and capital adequacy are the most significant factor for deposit growth of private commercial banks of Ethiopia.

➢ The researcher also recommended those private commercial banks should go beyond the expectation of their clients by improving their online banking option, by skipping fees they charge for specific period of time, by making easy to report a problem and other services.

➢ Those private commercial banks should increase their profitability by using appropriate marketing strategies. such as: - deliver customer service that is both friendly and educational, use multiple marketing channels to reach their desired audience, and telling a good story of the bank.

➢ Those private commercial banks Should have enough capital to increase deposit growth as well as to fulfil legal requirement.

➢ The government should give a little bit of freedom to those private commercial banks increasing their deposit interest rate. Because this variable significantly affects the deposit

growth of private commercial banks. As the annual report of the national bank of Ethiopia shows, there is a great difference between deposit interest rate and lending interest. Customers cannot prefer to deposit with minimum interest rate and borrow with maximum interest rate. Due to this, they prefer to invest rather than deposit in the bank. The researcher of this study believes that there should not be a very higher difference between the two rates.

➢ As explained in the previous chapter, the negative relationship between GDP growth rate and deposit growth rate may be the increment in consumption greater than the increment in GDP. If it is, those private commercial banks should focus on awareness creation to the public to save more rather than consume more.

➢ In general, this study suggested that a well-organized and sound banking structure is essential for consistent economic development in Ethiopia.

5.3. Suggestion for further researcher

This research has been mainly focused on some macro-economic and bank-specific factors of deposit growth by using ten sampled private commercial banks and ten years of secondary data collected from the annual report of each private bank, annual report of national of Ethiopia, and world bank data from the period 2010/11 to 2019/20. For future researchers who want to conduct their study similar to this topic, the researcher of this study recommended the following.

Included variables which did not study under this study such as unemployment rate, public awareness, financial literacy rate, and per capita income of the household.

Use more advanced research models and more advanced software for their regression analysis.

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Appendix I: The data used in the regression analysis

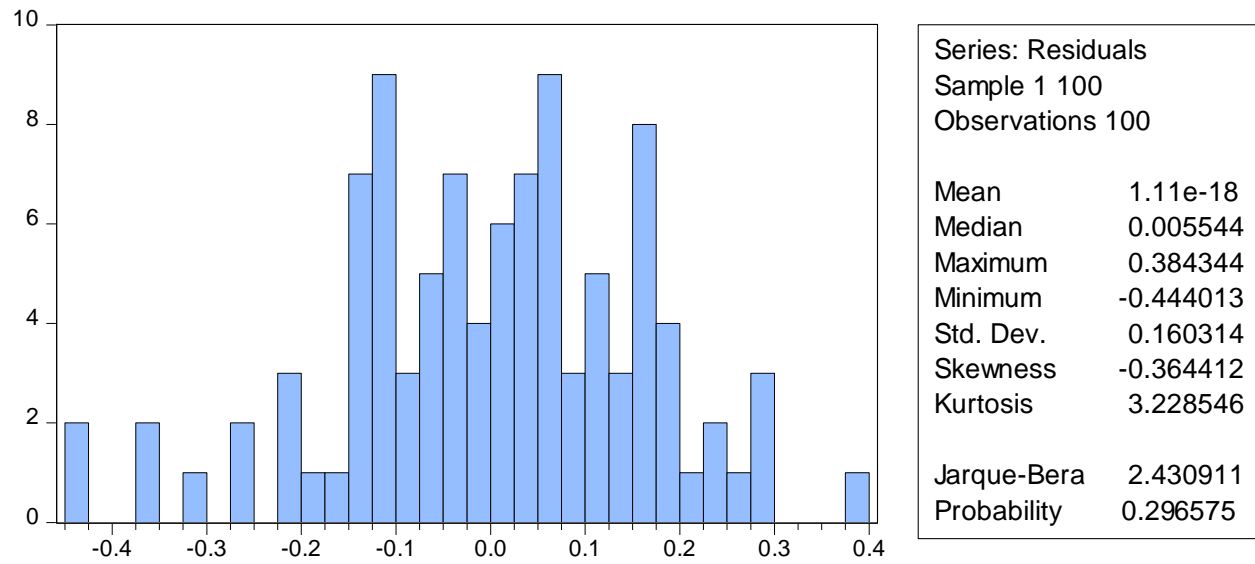| ID	YEAR	bank	LOGDGR	BR	CAP	CGR	GDP	IR	LER	RE
1	2010	AIB	-0.6374	0.0938	0.3137	0.0493	0.1140	0.0500	0.0162	0.2929
1	2011	AIB	-0.5715	0.2286	0.3405	0.1004	0.0870	0.0500	0.0142	0.3208
1	2012	AIB	-0.7244	0.3372	0.3007	0.0292	0.0990	0.0500	0.0124	0.2703
1	2013	AIB	-0.4401	0.3043	0.2670	0.1290	0.1035	0.0500	0.0107	0.2803
1	2014	AIB	-0.7015	0.3467	0.2816	0.0820	0.1040	0.0500	0.0092	0.2725
1	2015	AIB	-0.6356	0.1881	0.2520	0.2906	0.0800	0.0500	0.0078	0.2298
1	2016	AIB	-0.6330	0.3167	0.2508	0.1371	0.1010	0.0500	0.0067	0.2154
1	2017	AIB	-0.4687	0.1582	0.2096	0.1984	0.0770	0.0700	0.0060	0.2367
1	2018	AIB	-0.3763	0.1202	0.1568	0.2017	0.0900	0.0700	0.0056	0.3131
1	2019	AIB	-0.4294	0.1341	0.1495	0.2247	0.0840	0.0700	0.0054	0.4109
2	2010	BOA	-0.8433	0.1458	0.2005	0.0953	0.1140	0.0500	0.0162	0.2545
2	2011	BOA	-0.7394	0.1455	0.2062	0.1512	0.0870	0.0500	0.0142	0.2904
2	2012	BOA	-0.9408	0.2381	0.2387	0.1193	0.0990	0.0500	0.0124	0.2760
2	2013	BOA	-0.5940	0.2821	0.2403	0.1138	0.1035	0.0500	0.0107	0.2148
2	2014	BOA	-1.1508	0.3200	0.3021	0.0749	0.1040	0.0500	0.0092	0.3394
2	2015	BOA	-0.6532	0.4015	0.3066	0.1546	0.0800	0.0500	0.0078	0.1747
2	2016	BOA	-0.6452	0.2595	0.2652	0.2259	0.1010	0.0500	0.0067	0.1833
2	2017	BOA	-0.2855	0.2275	0.2086	0.2799	0.0770	0.0700	0.0060	0.2268
2	2018	BOA	-0.6090	0.1783	0.2388	0.3493	0.0900	0.0700	0.0056	0.1574
2	2019	BOA	-0.6086	0.4926	0.2114	0.2678	0.0840	0.0700	0.0054	0.1690
3	2010	CBO	-0.1311	0.1538	0.2687	0.5497	0.1140	0.0500	0.0162	0.1454
3	2011	CBO	-0.3530	0.1778	0.1612	0.5551	0.0870	0.0500	0.0142	0.2174
3	2012	CBO	-0.3845	0.4717	0.1499	0.5162	0.0990	0.0500	0.0124	0.3077
3	2013	CBO	-0.2247	0.3590	0.2166	0.7457	0.1035	0.0500	0.0107	0.3674
3	2014	CBO	-0.6564	0.3302	0.0802	0.2760	0.1040	0.0500	0.0092	0.3842
3	2015	CBO	-0.4536	0.2340	0.1279	0.4402	0.0800	0.0500	0.0078	0.2498
3	2016	CBO	-0.8530	0.4713	0.0510	0.1755	0.1010	0.0500	0.0067	0.0266

3	2017	CBO	-0.1553	0.1641	0.2541	0.3745	0.0770	0.0700	0.0060	0.1312
3	2018	CBO	-0.0928	0.3054	0.2935	0.5100	0.0900	0.0700	0.0056	0.2257
3	2019	CBO	-0.3964	0.0797	0.1459	0.5023	0.0840	0.0700	0.0054	0.2322
4	2010	DB	-0.5528	0.1034	0.2275	0.1674	0.1140	0.0500	0.0162	0.3189
4	2011	DB	-0.7766	0.1250	0.2291	0.1372	0.0870	0.0500	0.0142	0.3577
4	2012	DB	-0.7262	0.4306	0.2299	0.1272	0.0990	0.0500	0.0124	0.4044
4	2013	DB	-0.8964	0.2913	0.2361	0.1581	0.1035	0.0500	0.0107	0.3133
4	2014	DB	-0.9376	0.1729	0.2755	0.0608	0.1040	0.0500	0.0092	0.3069
4	2015	DB	-0.9186	0.4103	0.2580	0.1264	0.0800	0.0500	0.0078	0.2641
4	2016	DB	-0.8280	0.3773	0.2691	0.2216	0.1010	0.0500	0.0067	0.2315
4	2017	DB	-0.6561	0.2310	0.2254	0.0616	0.0770	0.0700	0.0060	0.2057
4	2018	DB	-0.5297	0.1072	0.2544	0.1945	0.0900	0.0700	0.0056	0.1884
4	2019	DB	-0.6149	0.0242	0.2115	0.1975	0.0840	0.0700	0.0054	0.1600
5	2010	LIB	-0.3504	0.2083	0.4209	0.4696	0.1140	0.0500	0.0162	0.1843
5	2011	LIB	-0.5607	0.3448	0.5295	0.2813	0.0870	0.0500	0.0142	0.1471
5	2012	LIB	-0.4703	0.3333	0.4622	0.3342	0.0990	0.0500	0.0124	0.1898
5	2013	LIB	-0.6724	0.1538	0.4166	0.3264	0.1035	0.0500	0.0107	0.2265
5	2014	LIB	-0.5592	0.4833	0.4074	0.4067	0.1040	0.0500	0.0092	0.1651
5	2015	LIB	-0.1812	0.3483	0.2904	0.4571	0.0800	0.0500	0.0078	0.2077
5	2016	LIB	-0.3758	0.2500	0.2486	0.4800	0.1010	0.0500	0.0067	0.2074
5	2017	LIB	-0.4140	0.2667	0.2641	0.4476	0.0770	0.0700	0.0060	0.2132
5	2018	LIB	-0.4862	0.2053	0.2453	0.4070	0.0900	0.0700	0.0056	0.2399
5	2019	LIB	-0.3886	0.1441	0.2202	0.4440	0.0840	0.0700	0.0054	0.2468
6	2010	NIB	-0.5985	0.0889	0.3746	0.3085	0.1140	0.0500	0.0162	0.2442
6	2011	NIB	-0.6027	0.1224	0.4414	0.1132	0.0870	0.0500	0.0142	0.2361
6	2012	NIB	-0.8795	0.2909	0.4234	0.1299	0.0990	0.0500	0.0124	0.2121
6	2013	NIB	-0.8540	0.2394	0.3761	0.1632	0.1035	0.0500	0.0107	0.1875
6	2014	NIB	-0.7200	0.1932	0.3632	0.2097	0.1040	0.0500	0.0092	0.1638
6	2015	NIB	-0.6315	0.2381	0.3158	0.2251	0.0800	0.0500	0.0078	0.1628
6	2016	NIB	-0.5670	0.3846	0.3352	0.2613	0.1010	0.0500	0.0067	0.1660

6	2017	NIB	-0.4929	0.1944	0.2758	0.3041	0.0770	0.0700	0.0060	0.1621
6	2018	NIB	-0.4990	0.2140	0.2504	0.1965	0.0900	0.0700	0.0056	0.1626
6	2019	NIB	-0.5535	0.1801	0.2291	0.0768	0.0840	0.0700	0.0054	0.1850
7	2010	OIB	-0.1573	0.3333	0.5812	0.7341	0.1140	0.0500	0.0162	0.1200
7	2011	OIB	-0.0659	0.2500	0.4521	0.7824	0.0870	0.0500	0.0142	0.1750
7	2012	OIB	-0.4121	0.4444	0.4349	0.5780	0.0990	0.0500	0.0124	0.1350
7	2013	OIB	-0.3558	0.6308	0.3428	0.6337	0.1035	0.0500	0.0107	0.1360
7	2014	OIB	-0.1935	0.4245	0.2957	0.5641	0.1040	0.0500	0.0092	0.2370
7	2015	OIB	-0.2219	0.3245	0.2110	0.4813	0.0800	0.0500	0.0078	0.2550
7	2016	OIB	-0.7756	0.1150	0.2551	0.4996	0.1010	0.0500	0.0067	0.1340
7	2017	OIB	-0.3616	0.1121	0.2365	0.3814	0.0770	0.0700	0.0060	0.1930
7	2018	OIB	-0.3138	0.0685	0.2236	0.2479	0.0900	0.0700	0.0056	0.3420
7	2019	OIB	-0.4758	0.1321	0.2157	0.2339	0.0840	0.0700	0.0054	0.2370
8	2010	UB	-0.5132	0.1429	0.2532	0.3067	0.1140	0.0500	0.0162	0.3014
8	2011	UB	-0.5470	0.3125	0.2829	0.2838	0.0870	0.0500	0.0142	0.3013
8	2012	UB	-0.9430	0.1587	0.2761	0.2838	0.0990	0.0500	0.0124	0.2974
8	2013	UB	-0.7139	0.2877	0.2598	0.1933	0.1035	0.0500	0.0107	0.1856
8	2014	UB	-0.9815	0.3191	0.3153	0.1044	0.1040	0.0500	0.0092	0.1428
8	2015	UB	-0.4873	0.2984	0.2488	0.3256	0.0800	0.0500	0.0078	0.1725
8	2016	UB	-0.9810	0.2733	0.2460	0.1045	0.1010	0.0500	0.0067	0.1804
8	2017	UB	-0.5752	0.1171	0.2123	0.2660	0.0770	0.0700	0.0060	0.1664
8	2018	UB	-0.3998	0.1965	0.1986	0.3983	0.0900	0.0700	0.0056	0.2098
8	2019	UB	-0.5850	0.2591	0.1786	0.2600	0.0840	0.0700	0.0054	0.2208
9	2010	WB	-1.2828	0.0800	0.0885	0.2300	0.1140	0.0500	0.0162	0.2366
9	2011	WB	-0.2851	0.3704	0.7807	0.0291	0.0870	0.0500	0.0142	0.2706
9	2012	WB	-0.8716	0.0270	0.2282	0.2103	0.0990	0.0500	0.0124	0.2286
9	2013	WB	-0.7914	0.2500	0.2745	0.2191	0.1035	0.0500	0.0107	0.1999
9	2014	WB	-1.1675	0.2211	0.1155	0.1855	0.1040	0.0500	0.0092	0.1534
9	2015	WB	-0.7513	0.3879	0.3010	0.1825	0.0800	0.0500	0.0078	0.1546
9	2016	WB	-0.9124	0.3230	0.2077	0.2700	0.1010	0.0500	0.0067	0.1439

9	2017	WB	-0.5762	0.0329	0.4506	0.3490	0.0770	0.0700	0.0060	0.1727
9	2018	WB	-0.3346	0.5455	0.7859	0.3513	0.0900	0.0700	0.0056	0.2210
9	2019	WB	-0.8291	0.1265	0.2517	0.3779	0.0840	0.0700	0.0054	0.1529
10	2010	ZB	-0.3567	0.3333	0.4196	0.4267	0.1140	0.0500	0.0162	0.1414
10	2011	ZB	-0.1613	0.7500	0.6580	0.0934	0.0870	0.0500	0.0142	0.4094
10	2012	ZB	-0.2659	0.1429	0.5173	0.0916	0.0990	0.0500	0.0124	0.4243
10	2013	ZB	-0.4007	0.1250	0.3792	0.1053	0.1035	0.0500	0.0107	0.3314
10	2014	ZB	-0.6785	0.2222	0.2000	0.1161	0.1040	0.0500	0.0092	0.2433
10	2015	ZB	-0.5826	0.1818	0.2494	0.0896	0.0800	0.0500	0.0078	0.3198
10	2016	ZB	-0.3614	0.6923	0.4152	0.1182	0.1010	0.0500	0.0067	0.2157
10	2017	ZB	-0.4754	0.1364	0.3193	0.2671	0.0770	0.0700	0.0060	0.2296
10	2018	ZB	-0.3996	0.7600	0.3802	0.0844	0.0900	0.0700	0.0056	0.2153
10	2019	ZB	-0.8693	0.1818	0.1289	0.0842	0.0840	0.0700	0.0054	0.1770

Appendix II Diagnostic test and other output

A. Normality test

Series: Residuals	
Sample 1 100	
Observations 100	
Mean	1.11e-18
Median	0.005544
Maximum	0.384344
Minimum	-0.444013
Std. Dev.	0.160314
Skewness	-0.364412
Kurtosis	3.228546
Jarque-Bera	2.430911
Probability	0.296575

B. Hausman test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	26.18	7	0.0005

C. Heteroskedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.881015	Prob. F(7,92)	0.5247
Obs*R-squared	6.282249	Prob. Chi-Square(7)	0.5072
Scaled explained SS	5.924920	Prob. Chi-Square(7)	0.5485

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 07/08/21   Time: 04:50

Sample: 1 100

Included observations: 100

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.054715	0.068828	-0.794951	0.4287
BR	-0.022169	0.031075	-0.713400	0.4774
CGR	-0.010838	0.024140	-0.448972	0.6545
IR	0.038160	0.651474	0.058575	0.9534
LER	-0.936087	1.774783	-0.527437	0.5992
RE	0.029992	0.057580	0.520881	0.6037
CAP	0.010383	0.036124	0.287412	0.7744
GDP	0.911604	0.442334	2.060894	0.0421

R-squared	0.062822	Mean dependent var	0.025443
Adjusted R-squared	-0.008484	S.D. dependent var	0.038174
S.E. of regression	0.038336	Akaike info criterion	-3.608252
Sum squared resid	0.135206	Schwarz criterion	-3.399839
Log likelihood	188.4126	Hannan-Quinn criter.	-3.523903
F-statistic	0.881015	Durbin-Watson stat	1.887776
Prob(F-statistic)	0.524743		

D. Ramsey RESET Test

Equation: UNTITLED

Specification: LOGDGR C BR CGR IR LER RE CAP GDP

Omitted Variables: Squares of fitted values

	Value	Df	Probability
t-statistic	1.590609	91	0.1152
F-statistic	2.530036	(1, 91)	0.1152
Likelihood ratio	2.742312	1	0.0977

F-test summary:

	Sum of Sq.	Df	Mean Squares
Test SSR	0.068826	1	0.068826
Restricted SSR	2.544342	92	0.027656
Unrestricted SSR	2.475516	91	0.027203

LR test summary:

	Value
Restricted LogL	41.67105
Unrestricted LogL	43.04221

Unrestricted Test Equation:

Dependent Variable: LOGDGR

Method: Least Squares

Date: 07/08/21   Time: 04:53

Sample: 1 100

Included observations: 100

Variable	Coefficient	Std. Error	t-Statistic	Prob.

C	-0.770364	0.521398	-1.477496	0.1430
BR	0.130921	0.153327	0.853868	0.3954
CGR	0.349249	0.344246	1.014532	0.3130
IR	3.284656	4.340330	0.756776	0.4511
LER	2.209437	8.175797	0.270241	0.7876
RE	0.293528	0.447580	0.655810	0.5136
CAP	0.245619	0.268996	0.913095	0.3636
GDP	-0.669987	2.637340	-0.254039	0.8000
FITTED^2	-0.576369	0.362357	-1.590609	0.1152

R-squared	0.595225	Mean dependent var	-0.570964
Adjusted R-squared	0.559640	S.D. dependent var	0.248547
S.E. of regression	0.164935	Akaike info criterion	-0.680844
Sum squared resid	2.475516	Schwarz criterion	-0.446379
Log likelihood	43.04221	Hannan-Quinn criter.	-0.585952
F-statistic	16.72701	Durbin-Watson stat	1.586925
Prob(F-statistic)	0.000000		

E. **multicollinearity test**

Variable	VIF	1/VIF
LER	2.86	0.350
IR	2.43	0.412
GDP	1.75	0.572
BR	1.40	0.713
CAP	1.40	0.715
RE	1.22	0.822
CGR	1.13	0.887
Mean VIF	1.74		

F. Serial Correlation Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.604618	Prob. F(2,90)	0.0795
Obs*R-squared	5.471355	Prob. Chi-Square(2)	0.0649

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 07/08/21   Time: 04:58

Sample: 1 100

Included observations: 100

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.045901	0.295772	0.155191	0.8770
BR	0.003569	0.134965	0.026441	0.9790
CGR	-0.040380	0.104502	-0.386400	0.7001
IR	-0.700540	2.825118	-0.247969	0.8047
LER	-1.067329	7.671466	-0.139130	0.8897
RE	-0.128977	0.251991	-0.511834	0.6100
CAP	0.064939	0.156985	0.413665	0.6801
GDP	0.253462	1.891004	0.134036	0.8937
RESID(-1)	0.194079	0.109793	1.767682	0.0805
RESID(-2)	0.128073	0.109396	1.170734	0.2448

R-squared	0.054714	Mean dependent var	1.11E-18
Adjusted R-squared	-0.039815	S.D. dependent var	0.160314
S.E. of regression	0.163474	Akaike info criterion	-0.689688
Sum squared resid	2.405132	Schwarz criterion	-0.429171
Log likelihood	44.48442	Hannan-Quinn criter.	-0.584252
F-statistic	0.578804	Durbin-Watson stat	1.987305
Prob(F-statistic)	0.811250		

G. Correlation Analysis:

Correlation	DGR	BR	CAP	CGR	GDP	IR	LER	RE
DGR	1.000000							
BR	0.188921	1.000000						
CAP	0.329782	0.352890	1.000000					
CGR	0.608198	0.043028	0.030284	1.000000				
GDP	-0.157415	0.080529	0.085894	0.000853	1.000000			
IR	0.175766	-0.250762	-0.179813	0.058476	-0.587233	1.000000		
LER	0.039466	-0.012767	0.315169	0.028737	0.585947	-0.676021	1.000000	
RE	0.043052	-0.065981	-0.023786	-0.283807	0.061529	-0.135042	0.251879	1.000000

H. Test for stationarity (unit root test)

Variable	Method	Unit root at	Statistic	Prob.**
Logdgr	Levin, Lin & Chu t*	Level	-4.31203	0.000
Cgr	Levin, Lin & Chu t*	Level	-3.43021	0.000
Gdp	Levin, Lin & Chu t*	Level	-10.6007	0.000
Ler	Levin, Lin & Chu t*	Level	-4.94614	0.000
Re	Levin, Lin & Chu t*	Level	-3.16247	0.000
CAP	Levin, Lin & Chu t*	Level	-1.87862	0.030
Br	Levin, Lin & Chu t*	Level	-6.00533	0.000
Ir	Levin, Lin & Chu t*	2nd difference	-4.75549	0.000