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**ST. MARY UNIVERSITY  
SCHOOL OF GRADUATE STUDIES**

**FACTOR AFFECTING PRIVATE COMMERCIAL BANKS  
LOAN AND ADVANCE IN ETHIOPIA**

**BY  
HELINA GEZAHEGN DESTA**

**JUNE, 2017**

**SMU**

**ADDIS ABABA**



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

**JUNE, 2017**

**SMU**

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## DECLARATION

I, Helina Gezahegn, hereby declare that the thesis work entitled “**Factor affecting private commercial banks loan and advance in Ethiopia**” submitted by me for the award of the Degree of Master of Business Administration in Accounting and Finance of St. Mary’s University at Addis Ababa Ethiopia, is original work and it hasn’t been presented for the award of any other Degree, Diploma, Fellowship or other similar titles of any other university or institution.

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## **ENDORSEMENT**

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

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Advisor Signature

**St. Mary's University, Addis Ababa June, 2017**

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## ***Abstract***

*The objective of the study is to investigate the factor affecting loan and advance of private commercial banks in Ethiopia. Panel data was collected from audited annual financial report of sampled banks, publications of National Bank of Ethiopia (NBE) and for the macro-economic factors from Ministry of Finance and Economic Cooperation (MoFEC) and used to analyses the bank-specific Factors as well as the macroeconomic Factors. Quantitative research approach and explanatory design were adopted in carrying out this research. Secondary data were collected from NBE for the selected six private commercial banks out of eighteen banks using convenient sampling technique from 2000-2015. The study employed panel data to analyze the factor affecting loan and advance on the credit decision of private commercial banks. Data were analyzed using descriptive statistics, correlation and regression analysis for total loan and advance. Before performing OLS regression the researcher uses model specification test to select the appropriate model for regression analysis. The study used the fixed effect model since the sample for this study was not selected randomly. Furthermore, the models were tested for the classical linear regression model assumptions and the results showed that all the tests are satisfactory in regressions. The results of panel data regression analysis showed that NBE Bill Purchase (BILL), Gross domestic Product (GDP), Inflation (INF), Market Share in terms of total asset (MS) has a positive and significant influence in determining credit facilities granted by the private commercial banks in Ethiopia. The findings also showed a significant and negative relationship between Deposit Growth (DG), loan to Total Assets (NPL), Liquidity (LIQ), Capital Adequacy (CAR), Lending Interest rate (LIR) has negative and insignificant influence, but Profitability (ROA) has positive and insignificant influence in determining credit facilities granted by the private commercial banks in Ethiopia. Ethiopian commercial banks better give an emphasis and employ various strategies so as to attract and seize deposits and shall focus on term deposit that have special consideration to keep the deposit for specified time to decrease high liquidity to have increased the credit facility.*

**Key Words:** *Banks, Loans and Advances*

## **List of Abbreviations and Acronyms**

AIB: Awash International Bank  
Bill: National bank of Ethiopia Bill purchase  
BOA: Bank of Abyssinia  
CAR: Capital Adequacy Ratio  
CBE: Commercial Bank of Ethiopia  
CC: Correlation Coefficient  
DBE: Development Bank of Ethiopia  
DB: Dashen Bank  
FEM: Fixed Effect Model  
GDP: Gross domestic Product  
IMF: Monetary International Fund  
INF: General inflation rate  
LIQ: Liquidity  
LIR: Lending interest rate  
LOG: Loan and advance  
MoFEC: Ministry of Finance and Economic Cooperation  
MS: Market share Asset  
NBE: National Bank of Ethiopia  
NIB: Nib International Bank  
NPL - Nonperforming loan  
OLS: Ordinary Least Square  
REM: Random Effect Model  
ROA - Return on Asset  
WB: Wogagen bank

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# Chapter One: Introduction

## 1.1. Background of the study

Lending which may be on short, medium or long-term basis is one of the services that commercial banks do render to their customers. In other words, banks do grant loans and advances to individuals, business organizations as well as government in order to enable them to embark on investment and development activities as a mean of aiding their growth in particular or contributing toward the economic development of a country in general (Olokoyo, 2011).

A bank loan is typically the largest asset and the predominant source of income for banks. The bank accepts customer deposits and uses that fund to grant loans to borrowers or invest in other assets that will yield a return higher than the amount of bank pays the depositor. Deposit indicates that the level of banking industry competition greatly influences bank lending strategy positively. (MacCarthy, 2010)

Monetary restriction deposits fall and banks reduce their lending. A simultaneous decrease in liquidity suggests that banks try to shield their loan portfolio by drawing down cash, securities and their net interbank position (Leorardo el al, 2001).comparing the effects of a monetary tightening on different kinds of banks, The impact on deposits is greatest for the banks with less incentive to shield this form of liability: small banks, with a high ratio of deposits to lending and well-capitalized banks that have greater capacity to raise other forms of external funds.( Kashyap and Stein,2000).

The main source of lending is deposited or money accepted from the depositors, but the amount that would have to be learnt is a percentage of the total deposited amount and the remaining is kept as a reserve for the purpose of maintaining its liquidity. Lending is the principal business for most commercial banks. Consequently, loan portfolio is the largest asset and a source of revenue for banks (Comptroller, 1998). In developing countries, bank lending behavior significantly will have a potential impact on executing the monetary policy than in developed countries (Alkilani et al, 2015). Bank's loans are one of the most important sources of long term financing in most countries (Freixas,2008).

Olokoyo (2011) said that Commercial banks are the most important savings mobilization and financial resource allocation institutions. Consequently, these roles make them an important phenomenon in economic growth and development. In performing this role, it must be realized that banks have the potential, scope and prospects for mobilizing financial resources and allocating them to productive investments. According to Olokoyo(2011) ”commercial banks would be interested in giving out loans and advances to their numerous customers bearing in mind, the three principles guiding their operations which are, profitability, liquidity and solvency.” However, commercial banks' decisions to lend out loans are influenced by a lot of factors such as the prevailing interest rate, the volume of deposits, the level of their domestic and foreign investment, bank liquidity ratio, prestige and public recognition to mention a few.

The study made on the title of determinants of lending behavior of commercial banks in Ethiopia, the studied variable that have been identified by Amano (2014), Temesgen (2016), Mitiku (2014) and Berhanu (2016) those Variables are volume of deposit, interest rate, GDP (Gross domestic product) and cash reserve requirement the result of the study was inconsistency on the above listed variables, However the factor affecting loan of commercial banks this study becomes important because commercial banks in Ethiopia need to understand the factors that affects loan and advance to manage their Loan and advance disbursement. The researcher interested in this field of study to investigate those inconsistencies in Ethiopia commercial banks loan factor affecting. The issue of banks factor affecting loan disbursement crucial to the financial sector in developing countries like Ethiopia. This study enables banks and regulators to keep control to the issue of loan disbursement which is very important to the security of their operation as well as the economy as a whole in the country. Therefore, this paper aimed to further investigate and evaluates those factors affecting loan disbursement of Commercial Banks in Ethiopia.

### **1.1.2 Commercial Banking in Ethiopia**

The Government of Ethiopia allowed the establishment of private banks and insurance companies in 1994, Proclamation No. 84/1994 that allows the Ethiopian private sector to engage in the banking and insurance businesses and proclamation no. 40/1996 in1996 that allows the establishment of MFIs mark the beginning of a new era in Ethiopia’s financial sector and opened

the opportunity for an inclusive financial sector in Ethiopia. The Ethiopian banking sector is currently comprised of a central bank (The National Bank of Ethiopia or NBE), two government-owned banks and sixteen private banks. In September 2011, NBE issued a regulation that increased the minimum paid up capital required to establish a new bank from 75 million Birr (\$3.4 million) to 500 million Birr (\$22.6 million). As a result of this regulation, all banks under formation that didn't meet all the necessary application requirements were either dissolved or diverted to other investments.

The National Bank of Ethiopia (NBE) placed several restrictions on the lending activities of the private commercial banks since 2008. It raised the reserve requirement on commercial banks from 5 percent (Directive No SBB/37/2004) to 10 percent effective July 2007 (Directive No. SBB/42/2007) and increased to 15 percent effective April 2008 (Directive No. SBB/45/2008). In addition to this the liquidity requirement has also increased following the revision of a reserve requirement, NBE revised the reserve requirement downwards to 10% effective Jan 2012 (Directive No SBB/46/2012) and further to 5% effective March 2013 (Directive No. SBB/55/2013) the regulator has implemented such a measure. The liquidity crunch encounter by private banks is mainly due to the directive compelling them to invest 27% of their gross loan disbursement into five-year government bonds at a very low interest rate. Moreover, private banks have been ordered to restructure their loan portfolios within two years, with 40pc of loans being short-term (with less than a one year maturity period). The other factor that has reduced the capacity of banks for loan disbursement was the credit cap that was set by the NBE

The government-owned Commercial Bank of Ethiopia (CBE) is the dominant commercial bank and accounts for 70% of total assets of banks as of May 2013 (IMF, 2013). The balance, 30%, is accounted by the other 15 banks. Unlike many government-owned commercial banks, CBE were relatively well run and profitable. The entry of the private sector in the financial sector has created better opportunities for enhanced access to financial services in the country directly through their operations and indirectly through the spillover effect on public financial institutions. The banking sector is one the major sources of financing the economy by providing loans to individuals, firms and government. Total new loan disbursed by banking sector reached 88.023 billion in 2015/16, indicating that increase level of loan disbursement in 2006/07. The

average annual rate of new loan disbursement by the banking sector over 2006/07-2015/16 period was 46.57 percent. The annual rate of growth of new loan disbursement over the same period by private banks 31.5 percent, while that of government owned banks was bank's CBE , DB and CBB together the annual growth rate was 68.69 percent see the below table 1.

**Table 1: Loan disbursement (in million Birr)**

Years	Private bank	Public bank	Total	%share private bank	%Share of public bank
2006/07	9,252.70	6,306.20	15,559.00	59.40	40.60
2007/08	11,807.00	15,447.50	27,254.50	43.90	56.10
2008/09	12,694.70	12,782.10	25,477.00	49.80	50.20
2009/10	14,965.86	13,939.20	28,905.10	51.80	48.20
2010/11	20,252.00	21,955.80	42,207.90	47.60	52.40
2011/12	19,152.90	36,949.20	56,102.10	34.10	65.90
2012/13	21,001.80	33,249.70	54,251.50	36.80	63.20
2013/14	21,027.50	38,937.90	59,965.40	35.10	64.90
2014/15	33,567.80	41,913.20	75,481.00	44.50	55.50
2015/16	38,396.80	49,626.30	88,023.10	43.60	56.40

Source: NBE, Annual reports

As can be observed from the above table fresh loan disbursed is increased by 16.62% in 2015/16 than a year ago loan disbursed. The public banks including CBE covered 56.3 % of the total loan disbursed in 2015/16 private banks all together granted Birr 38,396.8 billion or 43.6% of the total fresh loans disbursed during the same fiscal year, However the amount of new loan disbursed is increased from Birr 15.559 billion to Birr 88.023 billion the share of private bank new loan disbursed is increased Birr 9.253 million to Birr 38.396 billion but the share of private banks in loan disbursement since 2008 is decreasing.

## 1.2 Statement of the Problem

Lending is a major service rendered by banks, which contributes immensely to their revenue generation. The loans can either be in the short term, medium and/or long term basis depending on the type of need being addressed. On the views of McKinnon (2005) “Lending is a major driver in aiding the economic activities of households, firms and governments which has a bearing on the economic growth and the development of any nation. Thus, economic growth is generated through banks’ lending activities which provide resources for real investment.” Lending practices in the world could be traced to the period of the industrial revolution which increase the pace of commercial and production activities, there by bringing about the need for large capital outlays for projects, many captains of industry at this period were unable to meet up with the sudden upturn in the financial requirements and therefore turn to the banks for assistance (Olokoyo, 2011).

Banks are globally known as major actors in lubricating the economy through their intermediation role. Interestingly, this role constitutes a major source of their income and a means of distributing income and facilitating the payment system. According to Lucky and Lyndon (2016) banks’ income is generated from the spread between lending and deposit rates relative to the volume of loans granted. The volume of loans granted by a bank at any point in time is a function of its internal characteristics such as size, deposit base, liquidity, credit policy and other internal and external factors, which may be relatively within the control of the bank.

The health of the financial sector is a cornerstone for the overall economic development of a country. In an international market financial sector plays a great role in a process of enabling domestic product competent. They can foster economic growth of a country as well as for having a sustainable economy; a healthy financial sector can play their role by providing funding to the market with a lower price. Banks’ health reflects to a large extent the health of their borrowers, which in turn reflects the health of the economy as a whole.

World Bank report shows strengthening the country’s financial architectures will make available quality financial information to facilitate the investment decision and to reduce the risk of

financial crises and corporate failure together with their associated negative economic impact that have been witnessed in many industrialized and developing countries. Moreover, the banking industry is one critical component of the financial system in developing countries capable of facilitating capital accumulation and economic processes. This is possible through the efficient financial intermediation. The banks mobilize funds from the surplus spending units in order to bring financial costs down. Banks mostly transform liquid assets like deposits into illiquid assets like loans (Diamond and Rajan, 1998). This transformational process of banks' activity is at best influenced by a host of factors, namely, macroeconomic, bank level (Peek and Rosengreen, 1995) and industry level characteristics (Boot and Thakor, 2000).

The principal profit-making activity of commercial banks is making loans to its customers. In the allocation of funds to earn the loan portfolio, the primary objective of bank management is to earn income while serving the credit needs of its community (Reed and Gill, 1989). Lending represents the heart of the industry. Loans are the dominant asset and represent 50-75 percent of the total amount at most banks, generate the largest share of operating income and represent the banks greater risk exposure (Mac Donald and Koch, 2006).

There are few researches done on factor affecting loan and advance of commercial banks in Ethiopia. However, the results of those studies were inconsistent. According to Mitku (2014) and Berhanu (2016) finding, volume of deposit has insignificant relation with lending however, Amano (2014) reveals that volume of deposit has positive significant with lending. Amano (2014) and Berhanu (2016) found that cash reserve requirement had significant effect on banks' lending. As opposed to this finding, Mitku (2014) and Temesgen (2016) reported that cash reserve requirement has insignificant effect on bank's lending. According to Amano (2014) and Temesgen (2016) finding that the macro-economic variable GDP have no effect on commercial banks' lending behavior, but Berhanu (2016) and Mitku (2014) GDP have significant effect on commercial banks' lending. Among the macro-economic variable interest rate has significant effect on commercial banks' lending as found by Berhanu (2016), Amano (2014) and Temesgen (2016) but, Berhanu found that interest rate has negative significant effect on banks' lending on the other hand Mitku (2014) interest rate has insignificant effect on banks' lending.

In Ethiopia, to the researcher knowledge, the only empirical studies on the factor affecting loan of commercial banks were the research undertaken by (Mitku, 2014),(Amano, 2014), (Berhanu,2016) and (Temesgen,2016) on the determinants of lending behavior of commercial banks in the country. In their study, they emphasized on determinants of lending behavior of commercial banks in Ethiopia. But, all of them did not considered National bank bill purchase, profitability and market share as factors that affects the bank's loan and advance hence, the existence of inconsistent results between the four previous studies initiate this study for detail investigation in the area. Therefore, this study tries to fill this gap and find evidence of the factor that affect loan and advance of commercial banks in Ethiopia.

### 1.3 Objectives of the study

#### 1.3.1 General Objective of the study

The General objective of this study is to examine banks specific and macro-economic factor that affects loan disbursement of commercial banks in Ethiopia.

#### 1.3.2 Specific Objectives

- To examine the effect of deposit growth on loan and advance disbursement of private Commercial banks in Ethiopia.
- To examine the effect of gross domestic product growth rate (GDP) on loan and advance disbursement of private commercial banks in Ethiopia.
- To examine the effect of commercial bank's profitability on loan of private commercial banks in Ethiopia.
- To examine the effect of non-performing loans on loan disbursement of private commercial banks in Ethiopia
- To examine the impact of market share on loan and advance of private commercial banks of Ethiopia.

- To examine the effect of lending interest rate (INT) on loan and advance disbursement of private commercial banks in Ethiopian.
- To examine the effect National bank bill purchase on loan and advance disbursement of private commercial banks in Ethiopia.
- To examine the effect of Liquidity (LIQ) on loan and advance disbursement of private commercial banks in Ethiopian.
- To examine the effect of inflation rate (INF) on loan and advance disbursement of private commercial banks in Ethiopian.
- To examine the effect of capital adequacy ratio (CAR) on loan and advance disbursement of private commercial banks in Ethiopian.

## 1.4 Research Hypotheses

H1. Capital Adequacy Ratio has positive significant effect on banks' loan and advance.

H2. Lending rate has a negative and significant effect on loan and advance.

H3 Liquidity ratio has a negative and significant effect on banks' loan and advance.

H4. Asset quality has negative and significance effect on banks' loan and advance

H5. Banks' profitability has positive and significant effect on banks' loan and advance.

H6.National bank bill purchase has a negative and significant effect on loan and advance.

H7.Deposit growth has a positive and significant effect on bank loans and advance.

H8 Market share has a positive and significant effect on loan and advance.

H9. GDP growth has positive and significant effect on banks' loan and advance.

H10. Inflation has negative and significant effect on banks' loan and advance.

## 1.6 Significance of the study

This study is intended to establish the banks' loan factor affecting commercial banks of Ethiopia.

- The result of the study also will help the management of banks to make them conscious and to give care about the factor that affect banks' loan and advance.
- The study will have great contribution to the existing empirical findings of studies inconsistency on deposit of volume, GDP and interest rate by detailed further investigation to have a clear understanding on factor affecting banks' loan and advance.
- Finally, the finding of the study will have benefit to the commercial banks and regulatory bodies in terms of using them as input in formulating policy and guidelines with to effective management their loan and advance activity to the economy and also it helps for future study as bench mark.

## 1.7 Scope of the Study

The study mainly focuses on Banks loans, particularly on the bank specific and macro-economic factors affecting loans. The quantitative analysis, the researcher collected data for bank specific factor those have more than sixteen years' experience in the banking industry their financial statement from the National Bank of Ethiopia and data on Gross domestic product, Inflation rate and market interest rate from Ministry of Finance and Economic Cooperation (MoFEC). In this study, the researcher were only consider sixteen fiscal years, therefore. From 2000 to 2015 for the Loan disbursement analysis of the following six selected private commercial banks; Awash International Bank S.C (AIB), Bank of Abyssinia S.C (BOA), Dashen Bank S.C (DB), Nib International Bank S.C (NIB), Wogagen Bank S.C (WB) and United Bank S.C (UB).

## 1.8 Organization of the Research Report

The paper is organized in five chapters. The first chapter contains background of the study, statement of the problem, objective of the study, research hypothesis, significance of the study, and scope of the study. The second chapter discussed on review of related literature, including the conceptual framework for the analysis. Under this section relevant published and unpublished literatures, journals and other researcher's work that is previously done on similar areas were carefully discussed in a manner to achieve the objective of the study and help the data analysis. The third chapter contains research methodology and fourth chapter contains a data presentation, analysis and findings of the study. It deals with the factor affecting commercial banks loan disbursement in Ethiopia. Finally, in chapter five, conclusions and recommendations of the finding are included.

## **Chapter Two: Review of related Literature**

### **2. Introduction**

This chapter was focused on the review of relevant theoretical and empirical literatures on the factor affecting loan disbursement. This review of the literature established the framework for the study and clearly identified the gap in the literature.

The chapter had five broad sections. First Section discussed about the theoretical aspects of banks loan factor affecting, second Section discussed factors of commercial bank loan disbursement Theory, explained important empirical studies on other country in the area of bank loan disbursement factor affecting third section, fourth assessed related empirical studies in Ethiopia. Finally, discussed literature gap and summary.

A loan is a debt provided by an entity (organization or individual) to another entity at an interest rate, and evidenced by a promissory note which specifies, among other things, the principal amount of money borrowed, the interest rate the lender is charging, and date of repayment. A loan entails the relocation of the subject assets for a period of time, between the lender and the borrower. In a loan, the borrower initially receives or borrows an amount of money, called the principal, from the lender, and is obligated to pay back or repay an equal amount of money to the lender at a later time. The loan is generally provided at a cost, referred to as interest on the debt, which provides an incentive for the lender to engage in the loan. In a legal loan, each of these obligations and restrictions is enforced by contract, which can also place the borrower under additional restrictions known as loan covenants.

## 2.1 Theoretical framework

### 2.1.1 Loan Pricing Theory

Banks cannot always set high interest rates, e.g. trying to earn maximum interest income. Banks should consider the problems of adverse selection and moral hazard since it is very difficult to forecast the borrower type at the start of the banking relationship (Stiglitz and Weiss, 1981). If banks set interest rates too high, they may induce adverse selection problems because high-risk borrowers are willing to accept these high rates. Once these borrowers receive the loans, they may develop moral hazard behavior or so called borrower moral hazard since they are likely to take on highly risky projects or investments (Chodecai, 2004). From the reasoning of Stiglitz and Weiss, it is usual that in some cases we may not find that the interest rate set by the banks is commensurate with the risk of the borrowers.

### 2.1.2 Firm Characteristics Theories

These theories predict that the number of borrowing relationships will be decreasing for small, high-quality, information ally opaque and constraint firms, all other things been equal. (Godlewski & Ziane, 2008)

### 2.1.3 Theory of Multiple-Lending

It is found in literature that banks should be less inclined to share lending (loan syndication) in the presence of well-developed equity markets and after a process consolidation. Both outside equity and mergers and acquisitions increase banks' lending capacities, thus reducing their need of greater diversification and monitoring through share lending. (Ongene& Smith, 2000; Karceski et al, 2004; Degryse et al, 200; Carletti et al, 2006;).

### 2.1.4 Hold-up and Soft-Budget-Constraint Theories

Banks choice of multiple-bank lending is in terms of two inefficiencies affecting exclusive bank firm relationships, namely the hold-up and the soft-budget-constraint problems. According to the hold-up literature, sharing, lending avoids the expropriation of informational rents. This improves firms' incentives to make proper investment choices and in turn it increases banks'

profits (Von Thadden, 2004; Padilla and Pagano, 1997). As for the soft-budget-constraint problem, multiple-bank lending enables banks not to extend further inefficient credit, thus reducing firms' strategic defaults. Both of these theories consider multiple-bank lending as a way for banks to commit towards entrepreneurs and improve their incentives. None of them, however, addresses how multiple-bank lending affects banks' incentives to monitor, and thus can explain the apparent discrepancy between the widespread use of multiple-bank lending and the importance of bank monitoring. But according to Carletti et al (2006), when one considers explicitly banks' incentives to monitor, multiple-bank lending may become an optimal way for banks with limited lending capacities to commit to higher monitoring levels. Despite involving free-riding and duplication of efforts, sharing, lending allows banks to expand the number of loans and achieve greater diversification. This mitigates the agency problem between banks and depositors, and it improves banks' monitoring incentives. Thus, differently from the classical theory of banks as delegated monitors, their paper suggested that multiple-bank lending may positively affect overall monitoring and increase firms' future profitability

### **2.1.5 The Signaling Arguments**

The signaling argument states that good companies should provide more collateral so that they can signal to the banks that they are less risky type borrowers and then they are charged lower interest rates. Meanwhile, the reverse signaling argument states that banks only require collateral and or covenants for relatively risky firms that also pay higher interest rates (Chodechai, 2004; Ewert and Schenk, 1998).

### **2.1.6 Credit Market Theory**

A model of the neoclassical credit market postulates that the terms of credits clear the market. The theory postulates that if collateral and other pertinent restrictions remain given, then it is only the lending rate that determines the amount of credit that is dispensed by the banking sector. Therefore, with an increasing demand for credit and a fixed supply of the same, interest rates will have to rise. Any additional risk to a project being funded by the bank should be reflected through a risk premium that is added to lending rate to match the increasing risk of default. Subsequently, there exist a positive relationship between the default probability of a borrower

and the interest rate charged on the advance. It is thus believed that the higher the failure risks of the borrower, the higher the interest premium (Ewert et al, 2000).

## 2.2 Factor affecting commercial bank loan Theory

### 2.2.1 Capital Adequacy ratio

Capital adequacy is the levels of capital that banks are required to hold enable them to withstand credit, market and operational risks they are exposed to. It is used to absorb the potential losses resulted from their day to day activities and protect the bank's debtors.

This is a critical factor in the sense that capital itself is the amount of the bank's own fund available to support the bank's business at all times and it also serves or acts as a buffer in strained situations. Therefore, banks' capital creates liquidity for the bank due to the fact that they cannot merely rely on deposit as they are more fragile and prone to bank runs. 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.

The equity ratio is an indication of the risk characteristics which is risk aversion. Bank capitalization can affect bank willingness and ability to extend long term loans in several different ways. Banks with a larger capital cushion against credit risks should have a higher capacity to extend risky, long-term loans. Therefore, increasing bank equity enhances the bank's capacity to increase lending. In addition, better capitalized banks can attract more creditworthy borrowers that will qualify for long term loans. Alternatively, high levels of capital can reveal risk averse and conservatively managed banks that may be reluctant to issue risky long-term loans. Bouvatier and Lepetit (2007) and Djiogap and Ngomsi (2012) found that poorly capitalized banks are constrained to expand credit.

### 2.2.2 Interest rate

Monetary contraction and interest rate increase reduce spending directly; both also reduce spending indirectly by shrinking bank loan supply (Bernanke and Blinder, 1988). Kashyap and Stein (2000) study in U.S.A noted that if the contraction monetary policy reduces loan supply, it

would reduce more at banks with less liquid balance sheet. The more liquid banks can protect their loan portfolios by drawing down their buffer stock of cash and securities. To illustrate this argument the study made in Turkey by Sengonol and Thorbecke (2005) showed that contraction policy did reduce the supply of bank loan in Turkey. Both Kashyap and Stein (2000) in the U.S.A and Sengonol and Thorbecke (2005) in Turkey used Kashyap - Stein (K-S) a two-step approach to test monetary policy effects on loan supply. Keeton (1993) found that monetary policy not only affect bank lending directly, by changing deposits, but also indirectly, by changing the return on securities and the cost of CDs. Therefore, if the central bank reduces the rate, banks become reluctant to provide loans to firms and vice versa McKinnon (2009). Moreover, Interest rate changes also have an impact on lending. If the central bank reduces the rate, banks become reluctant to provide loans to firms. McKinnon (2009) noted that by the end of the year 2008 the interest rate in U.S.A derived to zero and interbank market became paralyzed. This led U.S.A banks to create huge excess reserves and did not stimulate new lending to households and non-bank firms because of near to zero interest rates. Despite banks are not profitable to give lending during interest rate declines, firms and households on the other hand increased their demand to get credit.

In addition to this, monetary policy, through a prime rate (Central Bank's rate) has a transmission mechanism on interest rates in the financial market (Borio and Fritz, 1995). Bank lending rates are mostly seen as being rigid for the reason that they do not move in tandem with the markets. A number of explanations have been suggested to account for the rigidity in bank lending rates. In the case of loans, the rigidity has been as a result of the rationing of credit to borrowers owing to the fact that there are problems of asymmetric information (Blinder and Stiglitz, 1983). Indeed, financial markets are not perfect; in the presence of adverse selection and moral hazard issues, banks are more likely to opt for credit rationing than to adjust their lending rates in a situation where there has been an upward adjustment of interest rates by the central bank. It may also be possible that when large banks capture a large market share, the impact of tight monetary policy on bank lending will be minimal. However, Berger and Udell (1992) could not find concrete support for the rationing of credit as a reason for the rigidity of the lending rate. Therefore, if the central bank reduces the rate, banks become reluctant to provide loans to firms and vice versa McKinnon (2009).

### 2.2.3 Liquidity ratio

Liquidity can be referred to as a state in which an asset can be readily converted into cash. A bank may be solvent by having enough assets to cover its liabilities but may remain illiquid. This may be due to a mismatch between its assets and liabilities (Kasman , 2010).

Comptrolle's (1998), states that lending is the principal business activity for most commercial banks. The loan portfolio is typically the largest asset and the predominate source of revenue. As such, it is one of the greatest sources of risk to a bank's safety and soundness. Since loans are illiquid assets, increase in the amount of loans means increase in illiquid assets in the asset portfolio of a bank. According to Pilbeam (2005), in practice the amount of liquidity held by banks is heavily influenced by loan demand that is the base for loan growth. If demand for loans is weak, then the bank tends to hold more liquid assets (i.e. short term assets), whereas if demand for loans is high they tend to hold less liquid assets since long term loans are generally more profitable. Therefore, loans and advance has negative impact on banks liquidity.

### 2.2.4. Non-performing Loans:

Non-performing loans are loans that are outstanding in both principal and interest for a long time contrary to the terms and conditions contained in the loan contract (Afza and Nazir, 2009).It follows that any loan facility that is not up to date in terms of payment of both principal and interest contrary to the terms of the loan agreement, is non-performing. Therefore, the amount of non-performing loans measures the quality of bank assets (Chakraborty, 2008). Bank nonperforming loans to total gross loans are the value of nonperforming loans divided by the total value of the loan portfolio (including nonperforming loans before the deduction of specific loan-loss provisions). The loan amount recorded as nonperforming should be the gross value of the loan as recorded on the balance sheet, not just the amount that is overdue. Non-performing Loans is measured by the ratio of nonperforming loans over the Total Loan (Bloem&Gorter, 2001).

Accordingly to IMF's (2006) "A loan is nonperforming when payments of interest and/or principal are past due by 90 days or more, or interest payments equal to 90 days or more have been capitalized, refinanced, or delayed by agreement, or payments are less than 90 days

overdue, but there are other good reasons such as a debtor filing for bankruptcy to doubt that payments will be made in full.” Similarly NBE (2008) “Nonperforming loan and advances are a loan whose credit quality has deteriorated and the full collection of principal and/or interest as per the contractual repayment terms of the loan and advances are in question.”

Therefore, NPLs are loans that are outstanding both in its principal and interest for a long period of time contrary to the terms and conditions under the loan contract. In addition that loans and advances comprise the huge share of banks any loan facility that is not up to date in terms of payment of principal and interest contrary to the terms of the loan agreement is NPLs. Thus, the amount of nonperforming loan likely measures the quality of bank assets.

### **2.2.5 Profitability**

According to Alper and Anbar (2011), in measuring the profitability of commercial banks there are a variety of ratios used of which Return on Asset (ROA), Return on Equity (ROE) and Net Interest Margin (NIM) are the major ones as described below.

Return on Assets (ROA): following Golin (2001) study, ROA has become the key ratio for measuring bank profitability in recent literature. It gives an idea as to how efficient management is using its assets to generate earnings and reflects the ability of a bank’s management to generate profits from the bank’s assets. It presents the return on each Birr of investing assets and can be measured simply by net profit after tax over total assets.

Rivard and Thomas (1997) suggest that bank profitability is best measured by ROA in that ROA is not distorted by high equity multipliers and it represents a better measure of the ability of the firm to generate returns on its portfolio of assets. Return on Equity (ROE): is the rate of return to shareholders or the percentage return on each Birr of equity invested in the bank. It measures a firm’s efficiency at generating profits from every unit of shareholders’ equity (also known as net assets or assets minus liabilities).

Net Interest Margin (NIM): another commonly watched measure of bank profitability is Net Interest Margin. It is described as a measure of the difference between the interest income generated by banks and the amount of interest paid out to their lenders (for example, depositors),

relative to the amount of their (interest earning) assets (Ongore & Kussa, 2013). If a bank manager has done a good job of asset and liability management such that the bank earns substantial income on its assets and has low costs on its liabilities, profits will be high. It is usually expressed as a percentage of what the financial institution earns on loans in a specific time period minus the interest paid on borrowed funds divided by the amount of total loans and advances.

### **2.2.6 NBE bill Purchase**

The National bank of Ethiopia on April 4, 2011 (NBE Directive No. MFA/NBE Bills/001/2011), the NBE issued a directive requiring all private commercial banks to invest 27% of their every new loan disbursements in NBE bills with maturity of five years at a very low interest rate, 3%, far below from what banks pay as an interest for the deposit. The government took this action as a way of mobilizing resources for government targeted private sector activities and these funds are administered by the DBE. Following the five-year development plan - GTP (2010/11-2014/15) which aims to at least lay the ground for the structural transformation of the economy from agriculture to industry, the government has fully recognized the pivotal role of the private sector in the transformation process and committed to finance the private sector in selected strategic sectors that facilitates such transformation. These strategic sectors (manufacturing and agro processing) require long-term and large loans. However, private banks are not interested in providing long-term loans and have also limited capacity in providing large loans (single borrower limit). It is this factor that led the GoE to issue this bill to mobilize resources and facilitate access to long-term and large loans. These resources are being intermediated by the DBE, a bank established to financing long-term projects. Consequently, private banks are shifting to long-term loans so as to reduce the amount of NBE bills as the turnover of short-term loans is high. Private Banks are also engaged in rescheduling loans, which is not considered as new loan and hence managed to avoid additional NBE bills. They are also engaged in fee-based projects where they only give loan guarantee for projects and simply get money for this service without even being engaged in administration. NBE was aware of private banks' reaction such as shifting to long-term loans, and came up with a new regulation that forces all private banks' short-term loans to constitute at least 40% of total loans in 2013 (Directive No. MFA/NBE Bills/002/2013)

### **2.2.7 Deposit growth**

To enable them to function as financial intermediaries, banks collect funds from savers in the form of deposit and then supply it to borrowers as loans. Thus, banks accept customer deposits and use those funds to give loans to other customers or invest in other assets that will yield a return higher than the amount bank pays the depositor (McCarthy 2010)

Olokoyo (2011) found that on determinants of lending behavior banks in Nigeria that volume of deposit has the highest impact and influence on the lending of commercial banks and a change in it will yield the highest change in banks' loans and advances. Therefore, banks should strive hard to manage their deposits efficiently so that their objective of profitability can be achieved and the multiplier effects maintained to the maximum. Most business organizations, especially in developing countries are highly dependent on bank loans as a source of capital and the ability of banks in giving loans depends much on their ability to attract deposits (Haron and Azmi, 2006). This is because an increasing trend in deposit mobilization implies more liquidity for the banks and more funds will be available for lending, thereby increasing the ability of the banks to make more profits.

### **2.2.8 Bank Market Share**

O'Regan (2002) defines market share as a company's sales in relation to total industry sales for a certain period. Pearce and Robinson (2003) also use the same definition that market share is sales relative to those of other competitors in the market. Market share is usually used to express competitive position. It is also generally accepted that increased market share can be equated with success, whereas decrease market share is a manifestation of unfavorable actions by firms and usually equated with failure.

The most common explanation as to why market share leads to higher profitability are higher economies of scale, experience and market power (Buzzel, 2004). Economies of Scale provide larger firms with cost advantages (Sharp et al., 2002). However, most studies indicate that economies of scale dissipate at a small percentage of the market. According to the efficiency hypothesis, market share is the consequence of efficiency rather than its cause. Differences in profitability among firms are due to higher efficiency. Efficient firms obtain a large market share

and earn high profits to induce a causal association between size and profitability. Firms offering products that offer customers greater value enjoy gains in market share. Better managed firms that have a competitive advantage grow faster than rival firms. Firms with superior skill and foresight gain market share through lower prices or through better products.

Market share is measured as the total deposits of bank as a percentage of all bank's total deposits. This ratio may be calculated using total assets or loan. However, since both deposits and loans can be considered as bank output, there is a need to make a choice between a deposit or asset measure of market share. In view of the fact that the asset components may include investment in securities and subsidiaries, which certainly would not be homogenous across firms' banks market share can be measured by the amount of capital they hold, loans they disbursed and deposits they received from the public. In a nut shell, it is related with the level of competition that exists in the banking industry among banks. The more a bank has larger amount of capital, deposits and loans as compared to competitors, the more it controls the market. (Tamiru, 2003).

### **2.2.9 Gross Domestic Product**

A strong economic condition measured by GDP, as a motivating factor for banks has statistically significant impact on issuance of more private credit to businesses. A strong economic condition creates more demand for goods and services which lead to more investment in different sectors, hence increase the per capita income as well as the savings, collectively these factors convince to banks to issue more private credit (Kashif and Mohammed, 2008). In a recent study Guo and Stepanyan (2011) indicated that domestic and foreign funding is positively associated with the credit growth. The strong economic growth leads to higher credit growth.

### **2.2.10 The rate of inflation**

A growing theoretical literature describes mechanisms whereby even predictable increases in the rate of inflation interfere with the ability of the financial sector to allocate resources effectively. More specifically, recent theories emphasize the importance of informational asymmetries in credit markets and demonstrate how increases in the rate of inflation adversely affect credit market frictions with negative repercussions for the financial sector (both banks and equity

market) performance and therefore long-run real activity (Huybens and Smith 1998). The common feature of these theories is that there is an informational friction whose severity is endogenous.

Given this feature, an increase in the rate of inflation drives down the real rate of return not just for money, but on assets in general. The implied reduction in real returns exacerbates credit market frictions. Since these market frictions lead to the rationing of credit, credit rationing becomes more severe as inflation rises. As a result, the financial sector makes fewer loans, resource allocation is less efficient, and intermediary activity diminishes with adverse implications for capital/long term investment. Hence, there is negative relationship between increase in inflation rate and loan and advance.

### **2.3. Review of related empirical studies**

This section provides the relevance empirical review related to the study of factor affecting loan of commercial banks. Monetary contraction and interest rate increase reduce spending directly; both also reduce spending indirectly by shrinking bank loan supply (Bernanke and Blinder, 1988). Kashyap and Steins (2000) study in U.S.A noted that if the contraction monetary policy reduces loan supply, it would reduce more at banks with less liquid balance sheet. The more liquid banks can protect their loan portfolios by drawing down their buffer stock of cash and securities. To demonstrate this argument the study made in Turkey by Sengonol and Thorbecke (2005) showed that contraction policy did reduce the supply of bank loan in Turkey. Both Kashyap and Stein (2000) in the U.S.A and Senngnol and Thorbecke (2005) in Turkey used kashyap - Stein (K-S) a two-step approach to test monetary policy effects on loan supply. Keeton (1993) found that monetary policy not only affect bank lending directly, by changing deposits, but also indirectly, by changing the return on securities and the cost of CDs.

Iriana. B (2003) asses bank liquidity and exchange rate in a European perspective, and claim that higher lending rates do not encourage banks to lend more. Abdkarim et al (2011) bank lending negatively, while controlling for other macroeconomic variables such as GDP and inflation rate. Besides, Tomak (2013) studied the bank level (size and access to funds) and market based (interest rate, inflation rate, GDP) variables impact on bank lending behavior in Turkey using quarterly bank level data of 15 private commercial banks and 3 state owned banks for the (2003-

2012) period. The empirical results indicate that the bank's business loan performance depends on its size, total liabilities, non-performing loans to total loans (NPL) and inflation rate. On the other hand, Djiogap and Ngomsi (2012) investigated the determinants of long term bank loan using a sample of 35 commercial banks of 6 African countries over the period (2001-2010). They found that a bank's ability to extend long term business loans depends on its size, capitalization, GDP growth, and the availability of long term liabilities. These results underlined the importance of supply side constraints in extending vital long term credit to firms. Moreover, Chernykh and Theodossiou (2011) reveal that the size of the bank, which is measured by assets and the bank capitalization are the only determinants of business and long term loans

Abid and al (2014) attempts to examine the determinants of households non-performing loans (NPLS) is affected by the electoral results of the party affiliated with the bank. The stronger the political party in the area where the firm is borrowing, the lower the interest rates charged. Besides, Ladime and al (2013) investigates the determinants of bank lending behavior in Ghana. Using the GMM estimator developed by Arellano and Bover (1995), Blundell and Bond (1998), they find that bank size and bank capital structure have a statistically significant and positive relationship with bank lending behavior They also find evidence of negative and significant impact of some macroeconomic indicators (central bank lending rate and exchange rate) on bank lending behavior.

Rababah (2015) examine the determinants of commercial bank lending in Jordan. He studies 10 Jordanian commercial banks during the period (2005-2013). He used the ratio of credit facilities to total assets as a dependent variable and 11 independent variables, including the ratio of deposits, ratio of nonperforming loans, capital ratio, liquidity ratio, deposit rate, window rate, legal reserve ratio, inflation and economic growth. The results showed that the ratio of nonperforming loans, liquidity ratio and window rate have a negative and significant impact on the ratio of credit facilities, while he found that the bank size and the economic growth have a positive and significant impact on the ratio of credit facilities granted by commercial banks in Jordan.

Ransford (2014) investigating the impact of macroeconomic instability on banking sector lending behavior in Ghana using data on commercial banks and macroeconomic instability from

1992 to 2009. The results under the Co-integration and Vector Error Correction Modeling framework show that bank lending has a long-run relationship with macroeconomic instability. The study, therefore, recommends that while banks should pay adequate attention to the consequences of their firm specific characteristics in their lending activities both in the short-run and long-run, their worries about macroeconomic instability should be limited to the long-run consequences of their lending behavior. It is also pertinent that appropriate measures be taken to curtail inflation and sporadic money supply growth, making banks become unfavorably disposed to lending given the attendant negative consequences of loan curtailment on economic growth in the long run.

Amidu (2013) analyses the broad determinants of bank lending in Sub Sahran Africa (SSA) using both micro bank and macro country level data of 264 banks across 24 SSA countries. The core findings that the structure of the banking market influences credit delivery in SSA in an environment where the financial sector is reformed and banks are allowed to corporate freely. Also, there is an evidence to suggest a link between bank credit and the financial strength of banks. The overall results suggest that regulatory initiative, which restricts banking activities, imposes severe entry requirements and requires higher regulatory capital, influences bank's decisions to supply loans.

Olokoyo (2011) investigated the determinants of commercial banks' lending behavior in the Nigerian context. The common determinants of commercial bank lending behavior and how it affects the lending behavior of commercial banks in Nigeria. The model used is estimated using Nigerian commercial banks loan advance and other determinants or variables such as their volume of deposits, their investment portfolio, interest (lending) rate, stipulated cash reserve requirement ratio and their liquidity ratio for the period; 1980 – 2005. The model hypothesizes that there is a functional relationship between the dependent variable and the specified independent variables. From the regression analysis, the model was found to be significant and its estimators turned out as expected and it was discovered that commercial bank deposits have the greatest impacts on their lending behavior. The study then suggests that commercial banks should focus on mobilizing more deposits as this will enhance their lending performance and should formulate critical, realistic and comprehensive strategic and financial plans.

Olumuyiw et al. (2012) takes a look at the determinants of lending behavior of commercial banks in Nigeria: a Co-integration analysis between 1975 to 2010. The study used secondary data and a series of econometric techniques to justify the long run relationship between the Commercial bank and its lending behavior over the period of analysis. Moreover, the study investigates the level of commercial bank loan advances in Nigeria and to also examine those various determinants of commercial banks' lending behavior in Nigerian. More so, the model used is estimated using Nigerian commercial bank Loan and advances and other determinants such as Volume of deposits, annual average exchange rate of the naira to dollar for the period of thirty seven (37) years, Investment Portfolio, Interest rate (lending rate), Gross domestic product at current market price and Cash reserve requirement ratio. However, the model result reveals that there is positive relationship between Loan and advances and Volume of deposits, annual average exchange rate of the naira to dollar, Gross domestic product at current market price and cash reserve requirement ratio except Investment portfolio and Interest rate (lending rate) that have a negative relationship. It was also revealed from the result that there is a long run relationship between Loan and advances and all the explanatory variables in the model and this shows that commercial bank has a lot of impact of their lending behavior.

#### 2.4 Related Empirical Studies in Ethiopia

Amano (2014) investigated the determinants of commercial banks' lending behavior in the Ethiopian context. The study aimed to test and confirm the effectiveness of the common determinants of commercial banks' lending behavior and how it affects the lending behavior of commercial banks in Ethiopia. Balanced fixed effect panel regression was used for the data of eight commercial banks in the sample covered the period from 2001 to 2013. Seven factors affecting banks' loan and advance were selected and analyzed. The results of panel data regression analysis showed that volume of deposit and bank size had a positive and significant impact on loan and advance. Liquidity ratio and interest rate had a negative and significant impact on loan and advance. Cash reserve requirement, and inflation rate had a positive and significant impact on loan and advance, but the coefficient sign was not as expected. The real GDP growth rate had statistically insignificant impact on bank's loan and advance. The study then suggests that commercial banks should focus on mobilizing more deposits as this will

enhance their lending performance and should formulate critical, realistic and comprehensive strategic and financial plans.

Similarly, Temesgen (2016) investigated main determinants of commercial banks' lending behavior in the Ethiopian context by using panel data of eight banks over the period 2004 to 2013. It tested and confirmed the impact of internal and external factors on Ethiopian commercial banks' lending behavior. Hence, explanatory research design was considered. The study measured bank loans and advances as the outcome variable and bank specific factors (liquidity ratio, volume of deposit, credit risk and bank capital) as internal explanatory variables, and monetary policy instruments (cash reserve requirement and lending rate) and macroeconomic factors (GDP and the annual foreign exchange rate of beer to USD) as explanatory variables. The fixed effect model has been preferred over the random effect model based on the Hausman Specification test and thus, clustered robust standard error has been used to overcome the heteroscedasticity problem. The results of fixed effect regression show that, except liquidity ratio and lending rate, which are significant at the 5 % level of significance, all bank specific factors are significant at 1% significance level. Thus, they influence the lending behavior of commercial banks in Ethiopia. On the other hand, macroeconomic variables (GDP and the annual foreign exchange rate of beer to USD) and cash reserve requirement ratio does not influence the lending behavior of Ethiopian commercial banks. Based on the finding of study, it has been suggested that Ethiopian commercial banks better give an emphasis and employ various strategies so as to attract and seize deposits, establish applicable credit policies and arrangements and also critically consider the creditworthiness, rationing and performing ability of their debtors. Besides, they should focus to develop competent and proficient liquidity, credit risk and foreign exchange exposure management systems so as to diminish their negative impact on their lending performance.

On other hand Mitiku (2014) investigates the main determinants of commercial bank lending in Ethiopia by using panel data of 8 commercial banks in the period from (2005-2011). He tested the relationship between commercial bank lending and its some determinants (bank size, credit risk, gross domestic product, investment, deposit, interest rate, liquidity ratio, and cash required reserve). Ordinary least square (OLS) were applied to determine the impact of those predictor variables on commercial bank lending. The results suggest that there is a significant relationship

between commercial bank lending and its size, credit risk, gross domestic product and liquidity ratio. But deposit, investment, cash required reserve and interest rates do not affect Ethiopian commercial bank lending for the study period. The study suggests that commercial banks have to give more emphasis to credit risk and liquidity ratio because it weakens bank loan disbursement and leads a bank to be insolvent.

Berhanu (2016) investigates the determinants of the lending decision of private commercial banks in Ethiopia and the impact of those factors that significantly affects the lending decision on the financial performance of the banks. Panel data were collected from an audited annual financial report of each bank, publications of National Bank of Ethiopia (NBE) and Ministry of Finance and Economic Cooperation (MoFEC) and used to analyze the bank-specific determinants as well as the macroeconomic determinants. The collected panel data were analyzed using descriptive statistics, and multiple linear regression analysis. Random effect panel regression was used for the data of six private commercial banks in Ethiopia for the sample covered the period from 2001 to 2015. Eight variables that affect banks' lending decision were selected and analyzed by E-view 9 Econometrics software. The results of panel data regression analysis showed that Liquidity ratio(LIQ), Capital adequacy ratio (CAR), Inflation rate (INF) and gross domestic product (GDP) had positive and statistically significant effect on banks' lending .Nonperforming loans (NPLs) Cash reserve requirement (CRR) and lending interest rate (INT) had negative and statistically significant effect on banks' lending. Volume of deposit (VoD) had positive but insignificant effect on banks' lending. Among factors that statistically significantly affecting banks' lending; liquidity (LIQ), Lending interest rate (INT) and GDP had positive and significant impact on financial performance, whereas non-performing loans and Cash reserve requirement had negative impact on financial performance. Capital adequacy ratio had positive and inflation rate had negative, but insignificant impact on financial performance. Therefore, banks' lending had an impact on the financial performance of private commercial banks in Ethiopia. The study suggests that Ethiopian commercial banks should/need to work more to improve their liquidity and capitalization, to reduce their nonperforming loans and consider the macroeconomic environment when extend loans. Moreover, banks should exert additional effort to properly manage their loan portfolio in order to enhance their profitability.

## 2.5 Summery and Knowledge Gap

In line with the above theoretical as well as empirical review, Factor affecting loan has important to the banking industry since being Loan is without a doubt the heart of banking business. It also discovered that banks loan and advance can be affected by different factors such as bank specific and macroeconomic factors while this study was focused on some of the banks specific and macroeconomic factors affecting Loan and advance of commercial banks of Ethiopia.

Most of the related empirical studies show that the supply of bank loans is usually expressed as a function of internal and external determinants. The internal factors are termed as micro or bank-specific determinants of bank loan, whereas the external factors are macroeconomic variables that are not related to bank management, but reflect the monetary, economic and legal environment that affect the operation and performance of the banking industry. While there are many empirical studies on the factor affecting loan of commercial banks in developed economies, there have been only a few studies on the factors affecting commercial banks loan in developing economies like Ethiopia.

However, to the knowledge of the researcher except the research undertaken by Amano (2014), Mitku (2014), Temesgen, (2016) and Berhanu (2016) there is no other empirical study on this area. In their study, they emphasized on determinants of lending behavior of commercial banks in Ethiopia, and determinants' of lending decision and their impact on financial performance. But, none of them investigates the impact of explanatory variables like profitability, NBE bill purchase and bank market share through the significant factor affecting loan and advance disbursement. Furthermore, there are inconsistent results between these four previous researches which need a detailed investigation in this area. Therefore, the lack of sufficient research on the issue in the context of Ethiopia and the existence of inconsistent results between the four previous studies initiates this study. Hence the objective of this study is to fill the knowledge gap regarding the factor affecting loan and advance of commercial banks in Ethiopia and to contribute literature in this area.

## **Chapter Three: Research Design and Methodology**

### **3. Introduction**

The purpose of this chapter is to present the underlying principles of research methodology and the choice of the appropriate research method for the study. The chapter is arranged as follows: Section 3.1 deals with research design. Section 3.2 presents research approach adopted by the study. This is followed by nature of the data, source of data collection 3.3 and population of the study 3.4. Next, the sample and sampling techniques under section 3.5, data analysis and presentation techniques are explained in section 3.6. Section 3.7 describes study.

### **3.1 Research Design**

Research design provides the framework for the collection and analysis of data (Bryman & Bell, 2011). Or it is the plan and structure of investigation so conceived as to obtain answers to research questions (Cooper & Emory, 1995). This means it gives the procedure necessary for obtaining the information needed to solve the research problems. Many research designs could be used to study business problems (Hair et al., 2011). Depending on the way in which researchers ask their research questions and present their purpose, the research design could be classified into three groups, namely exploratory, descriptive and explanatory studies (Saunders et al., 2009).

Exploratory study is performed when the researcher has little information or when the research problem is badly understood (Hair et al., 2011) and (Ghuari & Gronhaug, 2005). It is particularly useful to clarify the understanding of a problem, such as if you are unsure of the precise nature of the problem (Saunders et al., 2009).

Explanatory research design is used in this study, the data were obtained from secondary source, and to analyzing cause and effect relationship with adequate interpretation, the panel data design is used to carry out the Panel data design involves the pooling of cross-sectional units of observation sectional or time series estimation alone (Baltagi,2005) this advantage is eminent since the methodology allows several data points to be pooled on each variable, which increases the degree of freedom necessary in realizing more important economic estimates.

### 3.2 Research approach

In the investigative study there are three common approaches to business and social research, namely quantitative, qualitative and mixed methods approach (Creswell, 2003). Quantitative research is a means for testing objective theories by examining the relationship among variables (Creswell, 2009). On the other hand, qualitative research approach is a means for exploring and understanding the meaning of individuals or groups ascribe to a social or human problem the intent of developing a theory or pattern inductively (Creswell 2009). Finally, mixed methods approach is an approach in which the researchers emphasize the research problem and use all approaches available to understand the problem (Creswell, 2003). Therefore, based on the above discussions of the three research approaches and by considering the research problem and objective, in this study, the quantitative method is primarily used. A quantitative approach is one in which the investigator, primarily uses post positive claims for developing knowledge. Explanatory types of study were used to obtain information concerning factor affecting commercial bank loan. The research is conducted based on the secondary data, the purpose of using Explanatory analysis to explain the past evaluation of a series in terms of simple patterns and forecasts its future values.

### 3.3 Source of data collection

Data collection method is a phrase used to describe the way or manner in which a researcher gathers relevant information which he or she is going to use to answer the research questions. There are basically two main sources by which the researcher can collect data; the primary and secondary source. Primary data source is when the researcher collects new information either through observations, interviews, questionnaires and then uses this data for analysis (Saunders et al., 2009). Secondary data is data that exists somewhere having been collected and used for some other purposes (Gupta, 2012). After evaluating all possible data collection methods, the researcher found that the most appropriate method that provides practical answers to the research questions and the stated objectives of the study is the use of secondary data. Hence, the data used for this study is secondary in a nature which was obtained from an audited annual financial report of the sampled banks, will be collected from the National Bank of Ethiopia and sampled

banks official website. The data used in this study were non confidential type of banks and the macroeconomic variables were calculated by the concerned body like Ministry of Finance and Economic Cooperation (MoFEC) and Central statics agency. So, all the data used in this study from Public sources.

### 3.4 Population of the study

The target population of this study is banking sector in Ethiopia. According to NBE annual report 2015-2016, the number of banks declined to 18 from 19 due to the merger of construction and Business bank with a commercial bank of Ethiopia. Of the 18 banks 17 are Commercial banks and the remaining one is development bank. Abay Bank S.C(AB), Addis International Bank (ADIB) ,Awash International Bank S.C (AIB), Bank of Abyssinia S.C (BOA) ,Berehan International Bank S.C (BIB) Buna International Bank S.C (BUIB), Commercial Bank of Ethiopia (CBE), Cooperative Bank of Oromia S.C (CBO), Dashen Bank S.C (DB), Debu Global Bank (DGB), Development Bank of Ethiopia, Enat Bank (EB), Lion International Bank S.C (LIB), Nib International Bank S.C (NIB), Oromia International Bank S.C (OIB) Wogagen Bank S.C (WB), United Bank S.C (UB) and Zemen Bank S.C (ZB) from the above list two banks were Publically owned and the remaining sixteen were privately owned commercial banks the study cover banks those who have the required data and existed on the market for the period 2000-2015.

### 3.5 Sample and Sampling Techniques

#### 3.5.1 Sampling Techniques

Sampling involves the various procedure uses to select a part to represent a population. According to Zikmund (2000) there are two main alternative procedures which could be used in the selection of an appropriate sample and these include probabilistic/random sampling and non-probabilistic/non-random sampling. The probabilistic sampling is a sample procedure which gives each one in the population non-zero probability of selection. In other words, it is about giving every element in the population the same opportunity to be selected. On the other hand, non-probabilistic sample involves the selection of a sample on the basis of personal judgment or

purposive sampling. Purposive sampling offers the researcher to deliberately select items in the sample concerning the choice of items as supreme based on the selection criteria set by the researcher. Researchers need to have a large sample size in order to get more accurate results and have a high probability of detecting a true result. Since the number of banks in the country is small, the study assumed the data of all banks without taking a sample. According to the asymptotic theory, the sample size approaches to the population, the results from the sample estimates are more appropriate for generalizing to the general population. In order to obtain representative data, non-probabilistic or purposive sampling technique were employed in this study. The sampled banks were private commercial bank's those who have sixteen years' experience in the banking industry in Ethiopia who have continuously worked for 16(sixteen) years and have published financial report this criteria is set to avoiding the new entrant in the banking industry in Ethiopia.

### **3.5.2 Sampling of the study**

The target population of this study is Ethiopian commercial banks. So, the sampled commercial banks are Awash International Bank S.C (AIB), Bank of Abyssinia S.C (BOA), Dashen Bank S.C (DB), Nib International Bank S.C (NIB), Wogagen Bank S.C (WB) and United Bank S.C (UB) because the rest were recently established and for avoiding new entrant bias excluded. Being new entrant and appetite for getting market share in the early age of establishment has an impact on the bank loan. The sampled banks were those who have the required data and existed on the market for the period 2000-2015 G.C.As indicates the sampling technique for this study is a purposive sampling technique. The study covered a time period from 2000-2015 to six commercial banks in Ethiopia.

### **3.6 Data Analysis and Presentation**

The collected panel data were analyzed using descriptive statistics, correlations and multiple linear regression analysis. Descriptive statistics used to analyze the general trends of the data from 1999/2000-2014/2015 based on the sample of nine private commercial banks. Correlation matrix was used to examine the relationship between the dependent variables and explanatory variables. It has a total of 96 observations, A balanced correlation regression model was used to

determine the relative importance of each independent variable that factor affecting loan and advance. Finally, Ordinary Least Square (OLS) regression approach, including all of its assumptions were conducted using E-views 9 econometric software package, to test the casual relationship between the commercial banks loan and factor affecting. The assumptions were tested to see the applicability of the regression models developed first to test the relationship between banks loans and advances and independent variables of commercial banks in Ethiopia.

Since this study uses a panel data, there are two types of panel estimator approaches that can be employed, namely: fixed effects models (FEM) and random effects models (REM) (Brooks, 2008). To examine whether individual effects are fixed or random, used statistical distinguish between models.

## 3.7 Study Variables

### 3.7.1. Dependent Variable

#### ❖ Loans and Advances

According to Adepoju et al. (2007) the loans and advances refer to the amount borrowed by one person from another. The amount is also refers to the sum paid to the borrower.

The term 'loan' refers to the amount borrowed by one person from another. The amount is in the nature of the loan and refers to the sum paid to the borrower. Thus. From the viewpoint of borrower, it is 'borrowing' and from the view point of the bank, it is 'lending'. Loan maybe regarded as 'credit' granted where the money is disbursed and its recovery is made at a later date. It is a debt of the borrower. While granting loans, credit is given for a definite purpose and for a predetermined period. Interest is charged on the loan at agreed rate and intervals of payment. 'Advance' on the other hand, is a 'credit facility' granted by the bank. Banks grant advances largely for short-term purposes, such as purchase of goods traded in and meeting other short-term trading liabilities. There is a sense of debt in loan, whereas an advance is a facility being availed by the borrower. However, like loans, advances are also to be repaid. Thus a credit facility- repayable in installment solver a period is termed as loan while a credit facility repayable within one year may be known as advances. However, like loans, advances are also to be repaid. Thus, a credit facility- repayable in installments over a period is termed as loan while

a credit facility repayable within one year may be known as advances. To proxy loan and advance, log of loan and advance were used.

### 3.7.2 Explanatory Variables

#### ❖ Capital Adequacy Ratio

Capital adequacy is the level of capital that banks are required to hold to enable them to withstand credit, market and operational risks they are exposed to. It is used to absorb the potential losses resulted from their day to day activities and protect the bank's debtors.

This is a critical factor in the sense that capital itself is the amount of the bank's own fund available to support the bank's business at all times and it also serves or acts as a buffer in strained situations. Therefore, banks' capital creates liquidity for the bank due to the fact that they cannot merely rely on deposit as they are more fragile and prone to bank runs. 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.

The equity ratio is an indication of the risk characteristics which is risk aversion. Bank capitalization can affect bank willingness and ability to extend long term loans in several different ways. Banks with a larger capital cushion against credit risks should have a higher capacity to extend risky, long-term loans. Therefore, increasing bank equity enhances the bank's capacity to increase lending. In addition, better capitalized banks can attract more creditworthy borrowers that will qualify for long term loans. Alternatively, high levels of capital can reveal risk averse and conservatively managed banks that may be reluctant to issue risky long-term loans. Bouvatier and Lepetit (2007) and Djiogap and Ngomsi (2012) found that poorly capitalized banks are constrained to expand credit. Bank capitalization is measured by the ratio of capital and reserves to total assets.

H1. Capital Adequacy Ratio has positive significant effect on banks' loan and advance.

$$\text{Capital Adequacy ratio} = \frac{\text{capital and Reserves}}{\text{Total Assets}}$$

### ❖ Interest rate

Monetary contraction and interest rate increase reduce spending directly; both also reduce spending indirectly by shrinking bank loan supply (Bernanke and Blinder, 1988). Kashyap and Stein's (2000) study in U.S.A noted that if the contraction monetary policy reduces loan supply, it would reduce more at banks with less liquid balance sheet. The more liquid banks can protect their loan portfolios by drawing down their buffer stock of cash and securities. According to the loanable funds theory, banks need to aim to hold deposits for similar lengths of time as the term of loans financed. In order to survive, banks have to cover the interest rates they pay on deposits from the interest rates they charge on loans (interest margin). Higher loan prices, in turn, affect the quantity of funds intermediated by banks. This means that an increase of interest rates determines a reduction of credit growth. This result derives from the fact that when banks increase credit interest rates the individuals or businesses tend to lower their demand for credit.

Lending Interest rate as a price of money reflects market information regarding expected change in the purchasing power of money or future inflation (Ngugi, 2001). Monetary contraction and interest rate increase reduce spending directly; both also reduce spending indirectly by shrinking bank loan supply (Bernanke and Blinder 1988).

H2. Lending rate has a negative and significant effect on loan and advance.

### ❖ Liquidity

Liquidity can be referred to as a state in which an asset can be readily converted into cash. A bank may be solvent by having enough assets to cover its liabilities but may remain illiquid. This may be due to a mismatch between its assets and liabilities (Kasman , 2010).

Comptrolle's (1998), states that lending is the principal business activity for most commercial banks. The loan portfolio is typically the largest asset and the predominate source of revenue. As such, it is one of the greatest sources of risk to a bank's safety and soundness. Since loans are illiquid assets, increase in the amount of loans means increase in illiquid assets in the asset portfolio of a bank. According to Pilbeam (2005), in practice the amount of liquidity held by

banks is heavily influenced by loan demand that is the base for loan growth. If demand for loans is weak, then the bank tends to hold more liquid assets (i.e. short term assets), whereas if demand for loans is high they tend to hold less liquid assets since long term loans are generally more profitable. Therefore, loans and advance has negative impact on banks liquidity. In this study it is described by the ratio of liquid asset to Total asset.

H3 Liquidity ratio has a negative and significant effect on banks' loan and advance.

$$\text{LiquidityRatio} = \frac{\text{Total Liquid Asset}}{\text{Total Asset}}$$

#### ❖ Non-performing Loans:

Non-performing loans are loans that are outstanding in both principal and interest for a long time contrary to the terms and conditions contained in the loan contract (Afza and Nazir, 2009). It follows that any loan facility that is not up to date in terms of payment of both principal and interest contrary to the terms of the loan agreement, is non-performing. Therefore, the amount of non-performing loans measures the quality of bank assets (Chakraborty, 2008). Bank nonperforming loans to total gross loans are the value of nonperforming loans divided by the total value of the loan portfolio (including nonperforming loans before the deduction of specific loan-loss provisions). The loan amount recorded as nonperforming should be the gross value of the loan as recorded on the balance sheet, not just the amount that is overdue. Non-performing Loans is measured by the ratio of nonperforming loans over the Total Loan (Bloem&Gorter, 2001).

Accordingly to IMF's (2006) "A loan is nonperforming when payments of interest and/or principal are past due by 90 days or more, or interest payments equal to 90 days or more have been capitalized, refinanced, or delayed by agreement, or payments are less than 90 days overdue, but there are other good reasons such as a debtor filing for bankruptcy to doubt that payments will be made in full." Similarly NBE (2008) "Nonperforming loan and advances are a loan whose credit quality has deteriorated and the full collection of principal and/or interest as per the contractual repayment terms of the loan and advances are in question."

This study use the Nonperforming loans (NPLs), as a measure of the quality of bank loans portfolio. NPLs is a sum of borrowed money upon which the debtor has not made his or her scheduled payments for at least 90 days. A nonperforming loan is either in default or close to being in default. Most of the research undertaken in this area shows that, if banks have high nonperforming loan ratios they tend to lower their credit supply in order to be more cautious. Tomak (2013) in his study on the determinants of bank lending behavior of a sample of Turkish banks, finds that a significant relationship between NPLs and bank lending behavior and NPLs show a negative impact on the growth of total loans. Hence, this study expects a negative relationship between the nonperforming loans and credit growth.

H4. Asset quality has negative and significance effect on banks' loan and advance

$$\text{NPL Ratio} = \frac{\text{Total loan and advance}}{\text{Total asset}}$$

#### ❖ Profitability

According to Alper and Anbar (2011), in measuring the profitability of commercial banks there are variety of ratios used of which Return on Asset (ROA), Return on Equity (ROE) and Net Interest Margin (NIM) are the major ones as described below.

Return on Assets (ROA): following Golins (2001) study, ROA has become the key ratio for measuring bank profitability in recent literature. It gives an idea as to how efficient management is using its assets to generate earnings and reflects the ability of a bank's management to generate profits from the bank's assets. It presents the return on each Birr of investing assets and can be measured simply by net profit after tax over total assets.

Rivard and Thomas (1997) suggest that bank profitability is best measured by ROA in that ROA is not distorted by high equity multipliers and it represents a better measure of the ability of the firm to generate returns on its portfolio of assets. According to Wen (2010) a higher ROA shows that the company is more efficient in using its resources and calculated as:

$$\text{ReturnonAssets} = \frac{\text{Net Profit After T ax}}{\text{Total Assets}}$$

Return on Equity (ROE): is the rate of return to shareholders or the percentage return on each Birr of equity invested in the bank. It measures a firm's efficiency at generating profits from every unit of shareholders' equity (also known as net assets or assets minus liabilities). The ROE tells common shareholders how effectively their money is being employed.

Using this measure gets rid of the off-balance sheet activity bias in the denominator because those activities are reflected in shareholder equity. Where this ratio runs into problems, however, is that it fails to take into account financial leveraging. More specifically, profits generated with debt financing distort ROE because debt-financing profits are incorporated in net income, the numerator, but not shareholder equity, or the denominator. Therefore, a resultant high ROE can reflect either high profitability or low capital adequacy. It's calculated as:

$$\text{Return on Equity} = \frac{\text{Net Profit After Tax}}{\text{Average Equity Capital}}$$

Net Interest Margin (NIM): another commonly watched measure of bank profitability is Net Interest Margin. It is described as a measure of the difference between the interest income generated by banks and the amount of interest paid out to their lenders (for example, depositors), relative to the amount of their (interest earning) assets (Ongore&Kussa, 2013). If a bank manager has done a good job of asset and liability management such that the bank earns substantial income on its assets and has low costs on its liabilities, profits will be high. It is usually expressed as a percentage of what the financial institution earns on loans in a specific time period minus the interest paid on borrowed funds divided by the amount of total loans and advances.

$$\text{Net Interest Margin} = \frac{\text{Net Interest Income}}{\text{Total loans \& Advance}}$$

H5. Banks' profitability has positive and significant effect on banks' loan and advance.

However, there are divergent views among scholars on the superiority of one indicator over the others as a good measure of profitability. Depending on the aforementioned facts Return on Assets (ROA) was used in this study.

## ❖ NBE bill Purchase

The National bank of Ethiopia on April 4, 2011 (NBE Directive No. MFA/NBE Bills/001/2011), the NBE issued a directive requiring all private commercial banks to invest 27% of their every new loan disbursements in NBE bills with maturity of five years at a very low interest rate, 3%, far below from what banks pay as an interest for the deposit. The government took this action as a way of mobilizing resources for government targeted private sector activities and these funds are administered by the DBE. Following the five-year development plan - GTP (2010/11-2014/15) which aims to at least lay the ground for the structural transformation of the economy from agriculture to industry, the government has fully recognized the pivotal role of the private sector in the transformation process and committed to finance the private sector in selected strategic sectors that facilitates such transformation. These strategic sectors (manufacturing and agro processing) require long-term and large loans. However, private banks are not interested in providing long-term loans and have also limited capacity in providing large loans (single borrower limit). It is this factor that led the Government of Ethiopia to issue this bill to mobilize resources and facilitate access to long-term and large loans. These resources are being intermediated by the DBE, a bank established to financing long-term projects. Consequently private banks are shifting to long-term loans so as to reduce the amount of NBE bills as the turnover of short-term loans is high. Private Banks are also engaged in rescheduling loans, which is not considered as new loan and hence managed to avoid additional NBE bills. They are also engaged in fee-based projects where they only give loan guarantee for projects and simply get money for this service without even being engaged in administration. NBE was aware of private banks' reaction such as shifting to long-term loans, and came up with a new regulation that forces all private banks' short-term loans to constitute at least 40% of total loans in 2013 (Directive No. MFA/NBE Bills/002/2013). To proxy NBE bills, log of NBE bills were used.

H6.National bank bill purchase has a negative and significant effect on loan and advance.

## ❖ Deposit Growth

The lending activity is made possible only if the banks can mobilize enough funds from their customers. Since commercial banks depend on depositor's money as a source of funds, it means that there are some relationships between the ability of the banks to mobilize deposits and the

amount of credit granted to the customers (Tomola 2013). The decisions of bank management to lend are greatly influenced by the volume and cost of deposits to the banks. The interest paid on deposits ensures that banks should earn return over and above their cost of funds, hence the transformation of these liabilities to loan assets to generate interest income. Olokoyo (2011) asserts that commercial bank deposits have the greatest impacts on their lending behavior. Accordingly, positive relationship is thus expected between volume of deposits and bank lending decision.

H7. Deposit growth has a positive and significant effect on bank loans and advance.

$$DG_{it} = \text{Deposit}(1 - t) - \text{Deposit}(t) / \text{Deposit}(t - 1)$$

#### ❖ Market Share Asset

O'Regan (2002) defines market share as a company's sales in relation to total industry sales for a certain period. Pearce and Robinson (2003) also use the same definition that market share is sales relative to those of other competitors in the market. Market share is usually used to express competitive position. It is also generally accepted that increased market share can be equated with success whereas decrease market share is a manifestation of unfavorable actions by firms and usually equated with failure.

The most common explanation as to why market share leads to higher profitability are higher economies of scale, experience and market power (Buzzel, 2004). Economies of Scale provide larger firms with cost advantages (Sharp et al., 2002). However, most studies indicate that economies of scale dissipate at a small percentage of the market. According to the efficiency hypothesis, market share is the consequence of efficiency rather than its cause. Differences in profitability among firms are due to higher efficiency. Efficient firms obtain large market share and earn high profits to induce a causal association between size and profitability. Firms offering products that offer customers greater value enjoy gains in market share. Better managed firms that have a competitive advantage grow faster than rival firms. Firms with superior skill and foresight gain market share through lower prices or through better products.

Market share is measured as the total deposits of bank as a percentage of all bank's total deposits. This ratio may be calculated using total assets or loan. However, since both deposits and loans can be considered as bank output, there is a need to make a choice between a deposit or asset measure of market share. In view of the fact that the asset components may include investment in securities and subsidiaries, which certainly would not be homogenous across firms' banks market share can be measured by the amount of capital they hold, loans they disbursed and deposits they received from the public. In a nut shell, it is related with the level of competition that exists in the banking industry among banks. The more a bank has larger amount of capital, deposits and loans as compared to competitors, the more it controls the market. (Tamiru, 2003).

H8 Market share has a positive and significant effect on loan and advance.

$$MS = \frac{\text{Total Asset}}{\sum \text{Total Asset}}$$

#### ❖ Gross Domestic Product

GDP growth is used to control cyclical output effect which, it assumes, has a positive influence on bank lending. However, when the GDP growth slows down, particularly during recessions, credit quality deteriorates, and default increases, thus, reducing subsequent bank lending (Flamini et al., 2009). Most studies, specifically, Dietrich and Wanzenried (2011), Athanasoglou et al. (2008), and Demirguc-Kunt and Huizinga (1999), postulate and show that real GDP growth is a good proxy for the business cycle because it's up and downswings influence the demand for borrowing. The study of the effect of GDP on the demand for credit was carried by the assumption that better economic conditions increase the consumer and investor optimism. With higher expectations of future income, they tend to smooth consumption by increasing borrowing. This means that a GDP growth usually is followed by good macroeconomic conditions and usually is noticed an expansion of credit growth. The yearly real Gross Domestic Product (GDP) growth rate was used in this study.

H9. GDP growth has positive and significant effect on banks' loan and advance.

## ❖ Inflation

According to the recent theory of information asymmetry in the credit market, an increase in the rate of inflation drives down the real rate of return not just on money, but on assets in general. The implied reduction in real returns exacter bates credit market frictions. Since these market frictions lead to the rationing of credit, credit rationing becomes more severe as inflation rises. As a result, the financial sector makes fewer loans, resource allocation is less efficient, and intermediary activity diminishes with adverse implications for capital/long term investment. To proxy inflation, the annual gross inflation rate was used in this study.

H10. Inflation has negative and significant effect on banks' loan and advance.

### 3.8 Model Specification

The nature of data that was used in this study enable the researcher to use panel/longitudinal data model which is deemed to have advantages over cross sectional and time series data methodology. Panel data involve the pooling of observations on the cross-sectional over several time periods. As Brook (2008) stated the advantages of using a panel data set; first and perhaps most importantly, it can address a broader range of issues and tackle more complex problems with panel data than would be possible with pure time-series or pure cross-sectional data alone.

In summary, the fundamental, thus the general panel/longitudinal regression model was as follows:

$$A_{it} = \alpha + \beta C_{it} + u_{it}$$

With subscript  $i$  denote the cross-section and  $t$  representing the time-series dimension.

The left-hand variable  $A_{it}$  is the dependent variable,  $\alpha$  is the intercept term,  $\beta$  is a  $k \times 1$  vector of parameters to be estimated on the explanatory variables, and  $C_{it}$  is a  $1 \times k$  vector of observations on the explanatory variables,  $t = 1, \dots, T$ ;  $i = 1, \dots, N$ . Therefore, the general models which incorporate all of the variables.

$$LOAN_{it} = \alpha_i + \beta_1 * CAR_{it} + \beta_2 * LIR_{it} + \beta_3 * LIQ_{it} + \beta_4 * NPL_{it} + \beta_5 * ROA_{it} + \beta_6 * BILL_{it} + \beta_7 * DG_{it} + \beta_8 * MSD_{it} + \beta_9 * GDP_t + \beta_{10} * INF_t + \epsilon_{it} \dots \dots \dots (1)$$

Where,

LOAN<sub>it</sub>: Log of Total loans and advances for bank i<sup>th</sup> in year t

CAR<sub>it</sub>: Ratio of capital and Reserves to total assets for bank i<sup>th</sup> in year t

LIR<sub>it</sub>: Lending interest rate on annual average loans and advances for banki<sup>th</sup> in year t

LIQ<sub>it</sub>: Total liquid Asset to total asset for bank i<sup>th</sup> in year t

NPL<sub>it</sub>: Ratio of total loans and advances to total asset for the bank i<sup>th</sup> in year t

ROA<sub>it</sub>: Profitability ratio of net profit after tax to total assets for banki<sup>th</sup> in year t

BILL<sub>it</sub>: Log of NBE bill purchase for bank i<sup>th</sup> in year t

GD<sub>it</sub>: Growth of total deposit for the bank i<sup>th</sup> in year t

MS<sub>it</sub>: Total asset of each bank to total asset of industry six bank to for the bank i<sup>th</sup> in year t

GDP<sub>t</sub>: Annual real GDP growth for year t

INF<sub>t</sub>: Annual inflation rate for year t

Regression is more powerful than correlation. According to Brooks (2008), unlike correlation, in the case of regression if C has significant impact on A, thus change in A is influenced by change in C. Therefore, to see the impact of banks' factor affecting loan and advance on banks' loan and advance disbursement, the significant factors affecting loan were used as the representatives for the variation in loan and advance.

## **Chapter Four**

### **Data Presentation and Analysis**

#### **4.1. Introduction**

This chapter results of the factor affecting private commercial bank loan in Ethiopia. The chapter presents the diagnostics test results of multicollinearity, heteroscedasticity, autocorrelation, and normality. The chapter also presents results of the regression analysis and discusses the study results.

#### **4.2. Descriptive Statistics**

This section presents the descriptive statistics of dependent and explanatory variables used in this study. The dependent variable used in this study was LOG of Total loan & Advance (response variable), Capital Adequacy (CAR), Deposit Growth (DG), loan to Total Assets(NPL), Profitability(ROA), Liquidity(LIQ), NBE Bill Purchase (BILL), Market Share Asset (MS), GDP Growth rate (GDP), Inflation (INF ), Lending Interest rate (LIR)

##### **4.2.1. Summary Statistics**

Table 2 shows the summary descriptive results for all the variables used in the study such as mean, maximum, minimum, standard deviation, skewness, kurtosis and number of observation.

**Table 2: Summary of descriptive statistics of study variables over the period of 2000-2015**

	Total Loan & Advance (LOG)	Capital Adequacy (CAR)	GDP Growth rate (GDP)	Inflation (INF)	Lending Interest rate (LIR)	Liquidity(LIQ)	loan to Total Assets(NPL)	Market Share Asset (MS)	Profitability(ROA)	NBE Bill Purchase (BILL)	Deposit Growth (DG)
Mean	7.4472	0.1329	0.0872	0.1205	0.1148	0.2564	0.5440	0.1667	0.0278	2.4029	0.3265
Median	7.6931	0.1211	0.1025	0.1035	0.1188	0.2466	0.5639	0.1425	0.0299	0.0000	0.2771
Maximum	9.4320	0.2944	0.1260	0.3640	0.1250	0.6612	0.7667	0.2944	0.0486	8.6677	1.6667
Minimum	4.4773	0.0643	-0.0210	-0.1060	0.1050	0.0762	0.3610	0.0453	-0.0020	0.0000	-0.0335
Std. Dev.	1.1686	0.0435	0.0414	0.1176	0.0070	0.1080	0.0985	0.0622	0.0104	3.5981	0.2503
Skewness	-0.6044	1.5136	-1.5072	0.4962	-0.2789	1.4893	0.0628	0.4812	-0.5937	0.8357	2.8734
Kurtosis	2.7013	6.0389	4.0306	3.0631	1.4800	6.6862	1.8725	2.4780	2.8379	1.7342	13.9607
Jarque-Bera	6.2017	73.5950	40.5958	3.9549	10.4865	89.8419	5.1480	4.7950	5.7453	17.5829	612.6499
Probability	0.0450	0.0000	0.0000	0.1384	0.0053	0.0000	0.0762	0.0909	0.0566	0.0002	0.0000
Sum	714.9359	12.7628	8.3736	11.5722	11.0190	24.6180	52.2236	16.0000	2.6643	230.6808	31.3457
Sum Sq. Dev	129.7348	0.1799	0.1628	1.3139	0.0047	1.1075	0.9209	0.3674	0.0104	1229.9220	5.9501
Observation	96.0000	96.0000	96.0000	96.0000	96.0000	96.0000	96.0000	96.0000	96.0000	96.0000	96.0000

Source: Own estimation of research data (2017)

The credit facilities granted by the private banks in Ethiopia increased 140 times when they increased from 88 million Birr in 2000 to reach 12.5 billion Birr in 2015 and the average of the annual growth rate in the facilities granted by the banks during the period 2000 to 2015 was about 8.87% annually. With a mean value and standard deviation of 1.7 billion Birr and 3.22 million Birr respectively.

Capital Adequacy ratio is measured using total capital & reserve divided by total assets and its value ranges from a minimum of 6.43% to maximum of 29.44% with a mean value and standard deviation of 13.29% and 4.35% respectively. As far as profitability ratios concerned, the ROA value ranges from a minimum of -0.02% to a maximum of 4.86% with a mean value and standard deviation of 2.78% and 1.04% respectively. The result suggests that commercial banks in Ethiopia show low performance with regard to ROA during the study period and Market share measured in terms of total asset share ranges from 4.53% to 29.44% with a mean value of 16.67% and a standard deviation value of 6.22%. The mean value of the bank lending interest rate over the period under study was 11.48% with the maximum and minimum values of 12.5% and 10.50% respectively. There was little variation of interest rate towards its mean value over the periods under study with the value of standard deviation 0.70%. This implies that the stability of lending interest rate for subsequent years under the study periods. So there was almost no

competition between commercial banks to attract the customers with a motive of low lending interest rate under the study period.

As shown in the table 2 above, the mean value of bank deposit growth was around 32.65 percent for sampled private commercial banks in Ethiopia. It can be noticed that the bank deposit growth fluctuates between -0.03 and 16.67 %. This means, commercial banks were achieved 32.5 percent average deposit growth achieved from depositors for the period of 2000-2015. The standard deviation among banks in terms of bank deposit growth was 25.02 %; this confirms that there were lower variations of deposit growth among commercial banks during the study period. Exposure of private commercial banks in NBE bill is measured by natural logarithm of total bill purchased by private banks which are considered as a sample in the period under consideration. With reference to table 2 the mean value of NBE bill purchased by private commercial banks was 2.4029. The natural logarithm of total bill purchased by private commercial banks range from 0 to 8.668 with standard deviation of 3.5900. The reason being minimum value zero was that private commercial banks before exposed to the requirement. The mean value of liquid asset to total asset ratio was 25.64% and there was low dispersion of liquid asset to total asset ratio towards its mean value among banks that is shown by the standard deviation of 10.80%. The maximum value of liquid asset to total asset ratio was 66.12% which is far above the standard whereas the minimum value was 7.62% which is far below the standard. This indicates that there were some private commercial banks in Ethiopia having extra liquidation (banks around 66.12%) and others were going to face bank liquidity risk (banks around 7.6%). Therefore, it can be concluded that liquid asset to total asset ratio was highly dispersed among private commercial banks in Ethiopia. NPLs ratio measured by Total loan & Advance divided by total asset ranges from 36.10% to 76.67 %. It has a mean of 54.40% with 9.80% variation. This indicates that Commercial banks in Ethiopia incurred 54.40% NPLs on averages from its total loan.

The inflation or average price of goods and service on the basis of inflation in the country over the sample period was recorded an average of 12.05 %. The rate of inflation was highly dispersed which exhibits higher dispersion larger than its mean value over the periods under study towards its mean with standard deviation of 12.05%. This clearly shows that there was a bit more variations in terms of cost of living as it measured by inflation consumer price index. The other external factor is economic growth showed the mean GDP in Ethiopia during 2000-

2015 of 8.72%, with a maximum of 12.60 percent in 2010 and a minimum of -0.02 percent in 2003. The standard deviation for GDP was 4.14%; this implies that little variation GDP its mean value during the period of 2000 to 2015.

For almost all the variables, the mean and median values lie within their maximum and minimum values showing a good level of consistency. Regarding kurtosis and skewness, the result shows that most of the data lack normality. As can be seen from Table 2, the kurtosis value of the five variables exceeds 3 suggesting that the series are leptokurtic (peaked) relative to the normal. Also, the probability that the Jarque-Bera statistic exceeds (in absolute value) the observed value is generally low for all series; suggesting rejection of the hypothesis of normal distribution at 5% degree of significance. In terms of the skewness, all the variables are positively skewed except total loan & advance (LOG), economic growth and lending interest rate (LIR). Except the deposit growth, capital adequacy and liquidity whose skewness values are far from zero, the rest are showing values closer to zero; suggesting little problem with regard to skewness..

#### **4.2.2. Correlation Matrix**

Correlation is a way to index the degree to which two or more variables are associated with or related to each other. The most widely used bi-variant correlation statistics is the Pearson product-movement coefficient, commonly called the Pearson correlation which was used in this study. Correlation coefficient between two variables ranges from +1 (i.e. perfect positive relationship) to -1 (i.e. perfect negative relationship). The sample size is the key element to determine whether or not the correlation coefficient is different from zero/statistically significant. As a sample size approaches to 100, the correlation coefficient of about or above 0.20 is significant at 5% level of significance (Meyers et al. 2006). The sample size of the study was 6\*16 matrixes of 96 observations which was around 100 hence the study used the above justification for significance of the correlation coefficient. A correlation coefficient of 0, on the other hand indicates that there is no linear relationship between two variables (Brooks, 2008). The correlation matrix in table 3 predicts the likely relationship among variables in the study

**Table 3: Correlation Matrix (With Dependent Variable)**

	Total Loan & Advance (LOG)	Capital Adequacy (CAR)	GDP Growth rate (GDP)	Inflation (INF)	Lending Interest rate (LIR)	Liquidity(LIQ)	loan to Total Assets(NPL)	Market Share Asset (MS)	Profitability(ROA)	NBE Bill Purchase (BILL)	Deposit Growth (DG)
Total Loan & Advance (LOG)	1.00000										
	-----										
Capital Adequacy (CAR)	-0.34619	1.00000									
	0.00060	-----									
GDP Growth rate (GDP)	0.54404	-0.14903	1.00000								
	0.00000	0.14730	-----								
Inflation (INF)	0.48150	-0.09592	0.33939	1.00000							
	0.00000	0.35260	0.00070	-----							
Lending Interest rate (LIR)	0.25170	0.20525	0.06226	0.22547	1.00000						
	0.01340	0.04480	0.54680	0.02720	-----						
Liquidity(LIQ)	-0.39484	-0.04833	-0.30485	-0.19574	-0.13501	1.00000					
	0.00010	0.64010	0.00250	0.05600	0.18970	-----					
loan to Total Assets(NPL)	-0.50400	-0.11903	-0.17194	-0.31695	-0.59955	0.03448	1.00000				
	0.00000	0.24810	0.09390	0.00170	0.00000	0.73880	-----				
Market Share Asset (MS)	0.36717	-0.66241	0.00000	0.00000	0.00000	-0.14087	0.09102	1.00000			
	0.00020	0.00000	1.00000	1.00000	1.00000	0.17100	0.37780	-----			
Profitability(ROA)	0.44455	0.16567	0.59999	0.36572	0.14365	-0.45030	-0.23846	-0.05943	1.00000		
	0.00000	0.10670	0.00000	0.00020	0.16260	0.00000	0.01930	0.56520	-----		
NBE Bill Purchase (BILL)	0.68548	0.09163	0.21848	0.24152	0.38698	-0.35764	-0.61703	0.01151	0.31572	1.00000	
	0.00000	0.37460	0.03250	0.01780	0.00010	0.00030	0.00000	0.91140	0.00170	-----	
Deposit Growth (DG)	-0.64897	0.38672	-0.21679	-0.23013	-0.04117	0.10173	0.19862	-0.37423	-0.06634	-0.35660	1.00000
	0.00000	0.00010	0.03390	0.02410	0.69040	0.32400	0.05240	0.00020	0.52070	0.00040	-----

*Source: Own estimation of research data (2017)*

Lending Interest rate (LIR), Market Share Asset (MS), Profitability(ROA), Inflation (INF), Growth rate (GDP), NBE Bill Purchase (BILL) had statistically significant at the 5 % significance level and positive linear relationship with total Loan & Advance (LOG) with coefficient correlation of 0.25170, 0.36717, 0.44455, 0.48150, 0.54404, and 0.68548 respectively. On the other hand, Deposit Growth (DG), loan to Total Assets(NPL), Liquidity(LIQ) and Capital Adequacy (CAR) had negative linear relationship with total Loan & Advance (LOG) but statistically significant/not different from zero with coefficient correlation of -0.64897, -0.50400, -0.39484 and -0.34619 respectively.

Lending interest rate had statistically significant and negative linear relationship with total loans and advances. This result is also in line with the expectation of the study, which states that total loans and advances and lending interest had negative relationship. This derives from the fact that when banks increase lending interest rates the individuals or businesses tend to lower their demand for credit and finally results in that increase of interest rates determines a

reduction of credit growth and vice versa. Similarly, market share asset (MS) had statically significant and positive relationship with loans and advances the positive relationship between the market share of asset and loan and advance by private commercial banks in Ethiopia shows that large banks in terms of asset can use their full resources for loan and advance disbursement.

Loan and advance is positively correlated with bank profitability (ROA) with the coefficient of correlation 0.444555 and statistically different from zero/statistically significant. When the lending spreads increase, consequently, commercial banks will have more profits through lending activities. It means that the return on asset could increase accordingly. Hence, there is a positive relationship between lending spreads and profitability of commercial banks in Ethiopia. The macroeconomic factors, both real Gross Domestic Product (GDP) and inflation (INF) had statistically significant and positive linear relationship with total loans and advances. But, the result of inflation goes up against the expectation of the study. Inflation and loan and advance positive relationship indicated that as loan and advance increased three will be inflation. NBE bill purchase had statically significant and positive linear relationship with total loan and advance which is deviate from the expected result in this study this relationship show that when loan and advance increase the amount of investment in NBE bill purchase all so increase.

On the other hand capital adequacy ratio had statistically significant and negative linear relationship with total loans and advances and the result is opposing the expectation of the study. The study was expects positive linear relationship. Because, bank capitalization can affect bank willingness and ability to extend loans and advances in several ways: Banks with larger capital cushion against credit risks should have higher capacity to extend risky, long-term loans. Therefore increasing bank equity enhances the bank's capacity to increase lending. In this study the negative relationship between capital adequacy ratio and loan and advance this implies as banks increases there capital requirement there credit facility will decreased.

Similarly, liquidity of the bank had negative relationship with total loans and advances statistically significant/ not different from zero with coefficient correlation of -0.39484. This result is also in line with the expectation of the study. Indeed, a bank's ability to grant loans and advances was checked by the available cash in its vault. The demands of customers in terms of

withdrawals from their deposits have to be met instantaneously. Commercial banks, therefore, have to stock reasonable quantities of cash to meet their customers' demands. Hence, a commercial bank cannot afford to grant loans and advances in excess of its cashing ability (Ituwe , 1985).

On the other hand, loan to total assets (NPL) and Deposit growth (DG) had negative linear relationship with total loans and advances and statistically significant at 5% significance level with coefficient correlation of -0.64897, and -0.50400 respectively. This shows that an increase in these factors leads to decrease in total loans and advances of private commercial banks in Ethiopia and vice versa.

In general, even though the correlation analysis shows the direction and degree of associations between variables, it does not allow the researcher to make cause and effect inferences regarding the relationship between the identified variables, is simply stated that there is evidence for a linear relationship between the two variables, and that movement in variables is on average related to an extent given by the correlation coefficient. Thus, in examining the effects of selected independent variables on loan the econometric regression analysis which is discussed in the forthcoming section of the paper gives assurance to overcome the shortcomings of correlation analysis.

### **4.3. Testing Assumptions of Classical Linear Regression Model (CLRM)**

The researcher conducted diagnostic tests to guard against the possibility of obtaining and interpreting spurious regression results. The results of the tests are presented in the following sections.

#### **4.3.1. Multicollinearity Test**

The result of the test for existence multicollinearity between independent variable are presented in the correlation analysis using only independent variables in Table 4:-

**Table 4: Correlation Matrix (Only Independent Variables)**

	Capital Adequacy (CAR)	GDP Growth rate (GDP)	Inflation (INF)	Lending Interest rate (LIR)	Liquidity(LIQ)	loan to Total Assets(NPL)	Market Share Asset (MS)	Profitability(ROA)	NBE Bill Purchase (BILL)	Deposit Growth (DG)
Capital Adequacy (CAR)	1.0000	-0.1490	-0.0959	0.2053	-0.0483	-0.1190	-0.6624	0.1657	0.0916	0.3867
GDP Growth rate (GDP)	-0.1490	1.0000	0.3394	0.0623	-0.3048	-0.1719	0.0000	0.6000	0.2185	-0.2168
Inflation (INF)	-0.0959	0.3394	1.0000	0.2255	-0.1957	-0.3170	0.0000	0.3657	0.2415	-0.2301
Lending Interest rate (LIR)	0.2053	0.0623	0.2255	1.0000	-0.1350	-0.5996	0.0000	0.1436	0.3870	-0.0412
Liquidity(LIQ)	-0.0483	-0.3048	-0.1957	-0.1350	1.0000	0.0345	-0.1409	-0.4503	-0.3576	0.1017
loan to Total Assets(NPL)	-0.1190	-0.1719	-0.3170	-0.5996	0.0345	1.0000	0.0910	-0.2385	-0.6170	0.1986
Market Share Asset (MS)	-0.6624	0.0000	0.0000	0.0000	-0.1409	0.0910	1.0000	-0.0594	0.0115	-0.3742
Profitability(ROA)	0.1657	0.6000	0.3657	0.1436	-0.4503	-0.2385	-0.0594	1.0000	0.3157	-0.0663
NBE Bill Purchase (BILL)	0.0916	0.2185	0.2415	0.3870	-0.3576	-0.6170	0.0115	0.3157	1.0000	-0.3566
Deposit Growth (DG)	0.3867	-0.2168	-0.2301	-0.0412	0.1017	0.1986	-0.3742	-0.0663	-0.3566	1.0000

Source: Own estimation of research data (2017)

As noted by (Gujarati, 2004), a serious problem for multicollinearity is occurred if the correlation is about 0.8 or larger. I.e. if pair-wise or zero-order correlation coefficient between two regressions is out of the recommended range of multicollinearity which is -0.8 or 0.8. In the above correlation matrix there is no pair-wise relation that exceeds 0.8 which suggests for not rejecting the null hypothesis ( $H_0$ ) which states that there is no perfect pair-wise relation among regressions.

Therefore, it can be concluded that in this study that there is no problem of multicollinearity or the results showed that the problem of multicollinearity did not exist between variables in the model. Hence all the variables were retained for use in the estimations.

#### 4.3.2. Heteroscedasticity Test

It has been assumed thus far that the variance of the errors is constant. This is known as the assumption of homoscedasticity. If the errors do not have a constant variance, they are said to be heteroskedastic. To test this assumption the Harvey test was used having the null hypothesis of homoscedasticity. The assumption of homoscedasticity is that the residuals are approximately equal for all predicted dependent variable scores- the variance of errors is constant, if the assumption are met the pattern of the residuals will have about the same spread on either side of a horizontal line drawn through the average residual (Wooldridge, 2006). Otherwise if the errors

do not have a constant variance, it is said that the assumption of homoscedasticity has been violated. This violation is termed as heteroscedasticity. The Harvey's test was used to check for the presence of heteroscedasticity in the residuals (see Table 5).

**Table 5: Heteroscedasticity Test: Harvey (Summary)**

Version Of Test Value	df		Probability
F-statistic	1.744112	Prob. F(10,85)	0.0839
Obs*R-squared	16.34449	Prob. Chi-Square(10)	0.0902
Scaled explained	12.11731	Prob. Chi-Square(10)	0.2773

*Source: Own estimation of research data (2017)*

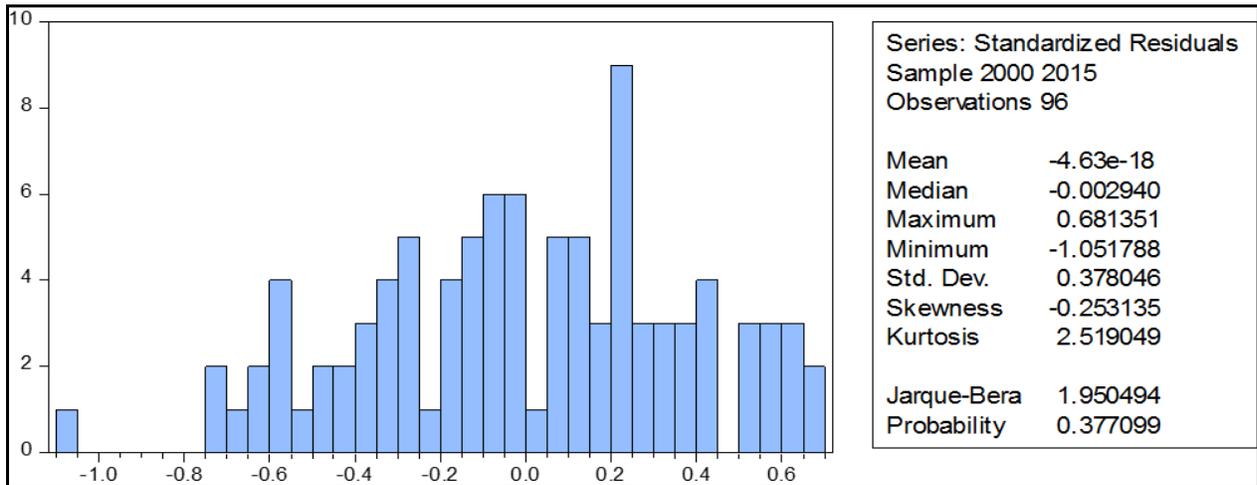
As shown in Table 5 both F-statistic and Obs\*R-squared version of test give the same conclusion that there is no evidence for the presence of heteroscedasticity since the p-values in all of the cases were above 0.05. The third version of the test statistics “Scaled explained SS”, which is, as the name suggests, based on a normalized version of the explained sum of squares from the auxiliary regression also give the same conclusion.

Generally, in the regression models used in this study it was proved that the test statistics is not significant and the variance of the error term is constant or homoscedastic and we had sufficient evidence to accept the null hypothesis of Homoscedasticity. The linear model is also correctly specified.

### 4.3.3. Normality Test

A normal distribution is not skewed and is defined to have a kurtosis coefficient of 3. Bera-Jarque formalizes this by testing the residuals for normality and testing whether the coefficient of skewness and kurtosis are zero and three respectively. Skewness measures the extent to which a distribution is not symmetric about its mean value and kurtosis measures how fat the tails of the distribution are. The Bera-Jarque probability statistics/P-value is also expected not to be significant even at 10% significant level (Brooks, 2008). According to (Gujarati, 2004), the BJ is a large sample test and our sample of 96 was equal to the frame was large; the study considered the BJ also.

**Figure 1: Normality Test**



Source: Own estimation of research data (2017)

As shown in the histogram in the figure1skewness and kurtosis approaches to zero (i.e. -0.253135) and Three (i.e. 2.519049) and the Jarque-Bera statistics (i.e. 1.950494) was not significant even at 10% level of significance as per the P-values shown in the histogram in the appendix was 0.377099). Hence, the null hypothesis that the error term is normally distributed should not be rejected. Even though, this is contradictory to what Table 2 shows i.e. Jarque-Bera probability for most of variables suggest lack of normality this would not have any effect as the sample size is large. Therefore it is possible to say that error terms follow normal distribution.

#### 4.3.4. Autocorrelation Test

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

**Table 6: Breusch-Godfrey Serial Correlation LM Test (Summary)**

Version Of Test	Value	df	Probability
F-statistic	1.750068	Prob. F(3,82)	0.16320
Obs*R-squared	5.776714	Prob. Chi-Square(3)	0.12300

*Source: Author Estimation of Research Data (2017)*

Table 6 shows that the Breush-Godfrey Serial Correlation LM Test gives an F-statistic of 1.7500 with a probability of 0.16320 and Obs\*R-squared version gives statics of 5.7767 with probability of 0.0.1230. Hence, from both versions of the test we fail to reject the hypothesis of no autocorrelation in the residuals at 1% significant level.

#### **4.4. Statistical Distinguish Between Models**

With panel/cross sectional time series data, the most commonly estimated models are probably fixed effect and random effects models. The researcher has used fixed effect regression instead of random effect model because of the following reasons:

According to (Gujarati, 2004), if T (the number of time series data) is large and N (the number of cross-sectional units) is small, there is likely to be little difference in the values of the parameters estimated by fixed effect model/FEM and random effect model/REM. Hence the choice here is based on computational convenience. On this score, FEM may be preferable. Since the number of time series (i.e. 16 year) is greater than the number of cross-sectional units (i.e. 6 private commercial banks), FEM is preferable in this case. According to Brooks(2008); Verbeek (2004); Wooldridge(2006), it is often said that the REM is more appropriate when the entities in the sample can be thought of as having been randomly selected from the population, but a FEM is more plausible when the entities in the sample effectively constitute the entire population/sample frame. Hence, this study chose to use FEM since the sample for this study was not selected randomly and closely approximates the sample frame.

#### **4.5. Results of Regression Analysis and its Interpretation**

##### **4.5.1. Results of Regression Analysis**

This section presents the regression result of fixed effect model that examines the factors affecting credit facility in case of private commercial banks in Ethiopia.

**Operational model:** the operational panel regression model used to find the statistically significant determinants of credit decision in case of private Ethiopian commercial banks was:

$$LOAN_{it} = \alpha_i + \beta_1 * CAR_{it} + \beta_2 * LIR_{it} + \beta_3 * LIQ_{it} + \beta_4 * NPL_{it} + \beta_5 * ROA_{it} + \beta_6 * BILL_{it} + \beta_7 * DG_{it} + \beta_8 * MSD_{it} + \beta_9 * GDP_t + \beta_{10} * INF_t + \epsilon_{it} \dots \dots \dots (4.1)$$

Accordingly, Table 7 below presents the result of fixed effect regression model that examines the impact of explanatory variables on loan and advance peroxide by LOG of total loan and advance (LOAN). Hence, LOAN is dependent variable whereas Capital Adequacy (CAR), Lending Interest rate(LIR), Liquidity(LIQ), Loan to Total Assets(NPL), Profitability(ROA), NBE Bill Purchase (BILL), Deposit Growth (DG), Market Share Asset (MS), GDP Growth rate (GDP), and Inflation (INF), are explanatory variables

**Table 7: Results of fixed effect regression model**

Explanatory Variables	Coefficient	Std. Error	t-Statistic	Prob.
Capital Adequacy (CAR)	-3.392811	1.571845	-2.15849	0.0339**
GDP Growth rate (GDP)	5.715575	1.456459	3.924296	0.0002*
Inflation (INF )	1.314891	0.42469	3.096117	0.0027*
Lending Interest rate (LIR)	-17.19958	8.710949	-1.97448	0.0518***
Liquidity(LIQ)	-2.123135	0.661853	-3.20786	0.0019*
loan to Total Assets(NPL)	-3.431099	0.839638	-4.0864	0.0001*
Market Share Asset (MS)	5.140693	2.233334	2.301802	0.0239**
Profitability(ROA)	11.05034	6.207892	1.780047	0.0789***
NBE Bill Purchase (BILL)	0.096281	0.019284	4.992847	0.0000*
Deposit Growth (DG)	-1.093206	0.237172	-4.60934	0.0000*
Constant	10.58854	1.349288	7.847503	0.0000*
R-squared	0.895346	Log likelihood		-42.332540
Adjusted R-squared	0.875723	F-statistic		45.62815
S.E. of regression	0.411966	Prob(F-statistic)		0.00000
Sum squared resid	13.5773	Durbin-Watson sta		1.5430

**Note** \* Significant at 1% \*\* Significant at 5% , and \*\*\* Insignificant

Source: Own estimation of research data (2017)

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

$$LOAN_{it} = 10.58 - 3.39 * CAR - 17.199 * LIR - 2.12 * LIQ - 11.05 * ROA + 0.096 * BILL - 1.09 * DG + 5.14 * MSD + 5.715 * GDP + 1.314 * INF \dots \dots \dots (4.2)$$

Where: - Dependent variable-LOG of total loan & advance (LOAN) and independent variables includes-Capital Adequacy (CAR), Lending Interest rate(LIR), Liquidity(LIQ), loan to Total Assets(NPL), Profitability(ROA), NBE Bill Purchase (BILL), Deposit Growth (DG), Market Share Asset (MS), GDP Growth rate (GDP), and Inflation (INF).

#### 4.5.2. Interpretation of R-squared, Adjusted R-squared and F-statistic

##### 4.5.2.1. Interpretation of Adjusted R-squared

An adjusted R-squared value which takes into account the loss of degrees of freedom associated with adding extra variables were inferred to see the explanatory powers of the models. In other words the adjusted R-squared shows satisfactory levels, which mean that nearly 87.57 percent of the volatilities in the total loan and advance, are explained by the volatilities of independent variables included in the equation. Therefore, an adjusted R-square having value of 0.0.875723shows that 87.57 percent of dependent variable is explained by the independent variables included in the model.

##### 4.5.2.2. Interpretation of F-Statistics

The F-statistics tests the fitness of the model and a recommended F-statistics should be greater than 5 for it to be considered fit. The regression F-statistic takes a value of 45.62815which is greater than 5 hence the model was fit for estimation.

Furthermore, F-statistics tests for the joint impact of all explanatory variables on the dependent variables. A corresponding p-value of zero attached to the test statistic shows that the null hypothesis that all of the slope parameters are jointly zero should be rejected even at 1 percent level of significance. This implies that all selected explanatory variables jointly can affect the level of total loan and advance.

### 4.5.3. Interpretation Results of the Regressions Values

Table 7 presents the estimation results of the operational panel regression model of total loans and advances as dependent variable and bank specific and macroeconomic explanatory variables for the sample of six private commercial banks in Ethiopia. The R squared and adjusted R-squared 89.53% and 87.57% respectively. It indicates that the model is a good fit. This means, more than 87.57% of variations in total loans and advances of private commercial banks in Ethiopia were explained by independent variables included in the model. However, the remaining 12.43% change in total loans and advances of private commercial banks in Ethiopia is caused by other factors that are not included in the model. the F-statistic was 45.62 and the probability of not rejecting the null hypothesis that there is no statistically significant relationship existing between the dependent variable (LOG) and the independent variables, is 0.000000 indicates that the overall model is highly significant at 1% and that all the independent variables are jointly significant in causing variation in total loans and advances

#### **A. Capital Adequacy (CAR) Vs Banks' Loan and Advance**

The results show that the coefficient ratio of the capital and reserve to the total assets (CAR) was negative but statistically significant at 5 percent, which means one unit increase in CAR, results in a-3.39 percent decrease in banks' loan and advance facility which means that higher capital adequacy ratio will lead to lower lending spread the ratio of the credit facilities granted by the private commercial banks in Ethiopia. However, this result is different from what is expected, but it is consistent with several studies that have found that the effect of the capital was slight on the bank lending, such as Berrospide and Edge (2010), Thomas F. Cosimano and Dalia S. Hakura (2007) and William Francis, Matthew Osborne (2009) also points out that the increased capital adequacy ratio will cause lower lending spread.

The result of findings inconsistency with findings of Biehanu (2016), Bouvatier&Lepetit, (2007), (Djiopap&Ngomsi, 2012), Imran and Nishat (2012) and Ajayi (2007). The basic argument of these researchers for the positive relationship between bank capitalization and lending ability is that banks with larger capital cushion against credit risks should have

higher capacity to extend risky, long-term loans. Therefore, increasing banks equity enhances the banks' capacity to increase lending.

The possible reason for the negative relationship between capital adequacy ratios and credit facility of commercial bank's in Ethiopia could be due to the fact that, during the sample period(i.e 2000-2015) the growth of banking industry, particularly private owned commercial bank is at infant stage. Capital is increase form shareholder contribution in the form of equity. The purpose of development of minimum capital adequacy ratio is to ensure banks can endure applicable losses during the financial turmoil in the future, higher capital requirement would lead banks to significantly raise the price of their lending because of the cost of capital is very higher, thus, give the economy a negative impact by such choice. (Thomas F. Cosimano, Dalia S. Hakura, 2011) As (Douglas J. Elliott, 2009) also stated that "higher capital requirement is not free, it will make harder for businesses and individuals to obtain loans, raise the cost of loans".

### **B. Lending Interest rate (LIR) Vs Banks' Loan and Advance**

The results have referred to the lack of statistical significance at 5 percent for the coefficient of the average lending interest rate on total loan and advance and the coefficient of the average lending interest rate (-17.19958), do not affect the ratio of credit facilities granted by the private commercial banks in Ethiopia at 5 percent but it affects at 10 percent significant levels. A one unit increase in LIR, results in a-17.20 percent decrease in banks' loan and advance facility, i.e. the demand for loans is fixed regardless of the interest rate. This result also reflects that the proportion of facilities is not affected by the size of the lending interest rate in the private commercial banks in Ethiopia.

As expected, the relationship between lending rate and lending of private commercial banks in Ethiopia is negative. The result is similar to the findings of Amano, (2014),Birhanu (2016)(Olokoyo (2011),Olumuyiwa ( 2012). and Bernanke and Blinder( 1988). In addition the result is in line with the loan pricing theory, that states setting too high interest rate increase the chance of loan default, consequently it boosts the rate of nonperforming loan. Thus as explained previously the boost in the rate of nonperforming reduce the lending ability of commercial

banks. On the other hand, this result is in contrary to the finding of Mitku (2014) who find the positive, but insignificant relationship between lending interest rate and loans and advances.

Finally, the result indicates that the increase of lending interest rate does not affect the credit facilitation of private commercial banks in Ethiopia. The study further indicates that the probability value of lending interest rate is 0.0518, which is statistically insignificant in this study. The P value of 0.0518 indicates that there is a 5.18% chance that the relationship between lending interest rate and loan and advance can be considered as the result of random chance alone. There is no strong relationship between these two variables. Consequently, the trend of borrowers depending on banks' loan as a source of fund is less when compared to developed countries. Hence, the borrowers are more sensitive to the lending interest changes. This has a possibility to reduce the demand of loan.

### **C. Liquidity(LIQ) Vs Banks' Loan and Advance**

The results indicate that the coefficient of the liquidity ratio (LIQ) was negative and has a statistical significance at 1 percent, i.e. A one unit increase in LIQ, results in a -2.12 percent decrease in banks' loan and advance facility which means that the high liquidity ratio reduces the proportion of the credit facilities granted by the private commercial banks in Ethiopia. Which is based on the argument of taking loans as illiquid assets of banks. According to this argument when the amount of loans provided by banks increase, the amount of illiquid assets in the total assets portfolio of banks increase and lead to the reduction in the level of liquid assets held by banks. Also, according to Pilbeam (2005, p. 42), if demand for loans is weak, then the bank tends to hold more liquid assets (i.e. short term assets), whereas if demand for loans is high they tend to hold less liquid assets since long term loans are generally more profitable. This result is consistent with what is expected, although some studies such as Olokoyo (2011), Amano (2014) and Olumuyiwa (2012). Found that the proportion of liquidity affect bank lending. It is noted that the negative effect reflects the correlation between the liquidity ratio and the proportion of the credit facilities as they represent the uses of the bank funds.

The result of findings inconsistency with those found positive association between liquidity and total loans and advances for insistence the research findings of Mitku (2014), Ajayi (2007), Ituwe (1985) and Ojo, (1978).

#### **D. Loan to Total Assets (NPL) Vs Banks' Loan and Advance**

The coefficient of the proportion of the total loans and advance to the total assets (NPL) has been negative and has a statistical significance at 1 percent which means one unit increase in NPL, results in a-3.43 percent decrease in banks' loan and advance facility i.e. the high proportion of the non-performing loans ratio reduces the credit facilities granted by private commercial banks in Ethiopia. This result is consistent with what is expected and with Birhanu (2016) and Guo and Stepanyan (2011), which reported that the rise in the proportion of the non-performing debt leads to a decline in the strength of the banking sector and the volume of the credit granted. However, it is in contrary with the studies of Mitku (2014) that finds a positive relationship between NPLs and total loans and advances.

This negative association between nonperforming loans and commercial lending could be attributed to the fact that, the impact of nonperforming loans on lending decision is both direct and indirect. With the direct effect, deterioration in bank loan assets indicates that banks are taking on high risks and hence banks cannot build up its risk at minimum levels, they tighten credit standards which will reduce the number of the whole loan applicants as well as successful loan applicants. With the indirect effect, incurring losses from nonperforming loans demands loan write-offs which deplete the equity capital of banks. This would in-turn affect the banks, ability to extend more loans to their customers, hence leads to reduction in lending.

#### **E. Profitability Vs Banks' Loan and Advance**

Profitability which is peroxide by return on average assets (ROA) is computed as net income divided by average total assets. This is generally considered as a good indicator to evaluate the profitability of the assets of a bank in comparison to other banks in the same industry. The coefficient of the return on average assets (ROA) has been positive and has a statistical insignificance at 5 % which means one unit increase in ROA, results in 11.05 percent increase in banks' loan and advance facility. This positive association between profitability and total

loans and advances is supported by prior research results of Jin (2016) and the finding of the result divergent from the investigation of Mohamed (2016).

Finally, the result indicates that the increase of profitability does not affect the credit facilitation of private commercial banks in Ethiopia. The study further indicates that the probability value of return on asset (ROA) is 0.0789, which is statistically insignificant in this study. The P value of 0.0789 indicates that there is a 7.89 % chance that the relationship between profitability and loan and advance can be considered as the result of random chance alone. There is no strong relationship between these two variables. This implies that private banks in Ethiopia might not diverted their return into loanable fund instead the profit is declared dividend.

### **NBE Bill Purchase (BILL) Vs Banks' Loan and Advance**

According to regression result investment in NBE-Bills proxied by logarithm of total NBE bill purchase is positively related with credit facilities granted by the private commercial banks in Ethiopia with a coefficient estimate of 0.0962. Holding other factors constant, a 100% increase in investment in NBE Bill increase credit facilities granted by the private commercial banks in Ethiopia by 0.09% and the p value of BILL (i.e. 0.0000) reveals that it is statistically significant at 1% level of significance.

In general, NBE bill highly affect interest income of private banks because the interest rate calculated on the bills (3%) is far less than the market lending rate. The 27 percent of the newly approved total loan and advance is obligated to buy NBE bill by private commercial Banks. However, the impact of the requirement of purchasing NBE bill on the positively related with credit facilities granted of private bank is mitigated by expand to other fee generating services (none interest income specially service charge and commission collected from foreign transactions or private bank in Ethiopia might shift the opportunity cost of buying NBE bill to total assets which leads that the bank are affecting by purchase of bill by smaller amount I.e. 0.096281 relative to all other factors.

### **F. Deposit Growth (DG) Vs Banks' Loan and Advance**

As it is evident in the table, the coefficient of the deposit growth was negative and statistically significant at 1 percent. The result shows that a one unit increase in DG, results in a -1.09 percent

decrease in banks' loan and advance facility which means that the growth of deposits does negatively affect the credit facilities granted by the private commercial banks in Ethiopia. This result differs from what is expected and what is found by the previous studies in this field, such as Sharma and Gounder (2012) and Olokoyo (2011), which indicated that the deposits have a positive impact on the volume of the bank credit. The reason for this result might be resulted from the high liquidity of the Ethiopia Private commercial banks; therefore, they can fund the loans by reducing the portion of the high liquidity.

The possible reason for negative relationship between deposit growth and loan and advance in private commercial banks in Ethiopia most people imagine banking to be the safe keeping of money and the provision of banking services they need such as electronic payment systems, ATMs, changing money and converting currency and "traditional" deposit banking fits that description pretty well. Originally bank deposits were bailments and the banks were simply money warehouses.

#### **G. Market Share Asset (MS) Vs Banks' Loan and Advance**

The coefficient on market share of asset is positive and significant at 5 percent significant level; suggesting that the ability to exercise power in the market as measured by the market share of asset that a bank holds was significant in explaining credit facilities granted by the private commercial banks in Ethiopia. The positive relationship between the market share of asset and credit facilities granted by the private commercial banks in Ethiopia shows that large banks in terms of asset can use their full resources for credit facilities.

#### **H. Inflation (INF) Vs Banks' Loan and Advance**

Regarding the macroeconomic variables, the results show that the coefficient of the inflation rate (INF) was positive and statistically significant at 1 percent. The result shows that a one unit increase in INF, results in a 1.31 percent increase in banks' loan and advance facility which means that the inflation rate does affect the ratio of credit facilities granted by the private commercial banks in Ethiopia. We expect inflation to be positively related to credit growth, a rise in inflation results in higher demand for nominal credit. Indeed, Guo and Stepanyan (2011) found a positive relationship. This result can be explained by the effect of the interest rate of

loans on the proportion of credit facilities extended by the Ethiopia private commercial banks, that is the higher inflation rates may lead to an increase in the nominal interest rates on loans, and it does affect the demand for loans negatively but the researcher gets a positive effect, which might implies that private bank borrowers might not be price sensitive.

### **I. GDP Growth rate (GDP Vs Banks' Loan and Advance**

The economic growth rate coefficient (GDP) was positive and statistically significant, the result shows that a one unit increase in GDP, results in a 5.71 percent increase in banks' loan and advance facility which means that the high rate of the economic growth increases the proportion of the credit facilities granted by the private commercial banks in Ethiopia. This percentage is consistent with what is expected and with what was found by several studies such as Imran and Nishatm (2012), which reported that the economic growth has a positive impact on the bank credit. We expect a positive relationship between real economic growth and bank lending. Real GDP growth measures the country's overall performance. According to Aysan, Dalgic and Demirci (2010) high growth signifies high consumption and investment which can translate to higher demand for credit by both firms and households.

## Chapter Five

### Summary, Conclusions and Recommendations

#### 5.1. Introduction

The study identifies factors affecting credit facility in private banks performance measured by LOG of total loan and advance from 2000-2015. This chapter outlines the conclusions of the study in accordance with the study results. It also gives an insight on the recommendations.

#### 5.2. Conclusions

Banks play very important roles in the economic development and growth of any nation. As an important component of the financial system, they channel scarce resources from the surplus economic units to the deficit economic units in the form of loans and advances. The supply of bank loans is usually expressed as a function of internal and external determinants. The internal determinants are termed as micro or bank-specific determinants of bank lending, while the external determinants are macroeconomic variables that are not related to bank management but reflect the monetary, economic and legal environment that affect the operation and performance of financial institutions.

Accordingly, the broad objective of this study is to identify banks specific and macro-economic factor that affects loan disbursement of private commercial bank in Ethiopia. To achieve this broad objective, the study used quantitative research approach. To this end, data collected from Ministry of Finance and Economic Cooperation (MoFEC), National Bank of Ethiopia (NBE) and each bank's annual financial reports and a sample size of six Ethiopian private commercial banks over the period of 2000 to 2015.

The study variables identified factor affecting of loan and advance disbursement. However, depending on the practical context of Ethiopian banks the researcher selected ten variables namely: Capital Adequacy (CAR), Deposit Growth (DG), loan to Total Assets(NPL), Profitability(ROA), Liquidity(LIQ), NBE Bill Purchase (BILL), Market Share Asset (MS), GDP Growth rate (GDP), Inflation (INF ), Lending Interest rate (LIR)as independent variables and one dependent variables total loans and advances.

The analysis was conducted using panel data estimation technique of fixed effect model using E-views 9 statistical software. The study goes through all diagnostic tests, including multicollinearity, heteroskedacity, normality and autocorrelation. Hence, the test result shows that the data was found to be homoskedastic, free of autocorrelation free of Multi-collinearity and normally distributed. The descriptive statistics revealed the data to be normal. Also the coefficient of determination ( $R^2$ ) is 0. 87572 explanatory variables were able to explain 87.57% the total variations of the dependent variables banks' on the credit facility. The regression result shows the NBE Bill Purchase (BILL), GDP Growth rate (GDP), Inflation (INF), Market Share in terms of total asset (MS) has a positive and significant influence in determining credit facilities granted by the private commercial banks in Ethiopia.

Capital adequacy (CAR) found to have Negative and significant relationship with the credit decision of private commercial banks in Ethiopia. Due to the fact that, during the sample period (i.e 2000-2015) the growth of the banking industry, particularly privately owned commercial bank is at the infant stage. Capital is increased from a shareholder contribution in the form of equity. The purpose of development of minimum capital adequacy ratio is to ensure banks can endure applicable losses during the financial turmoil in the future, higher capital requirement would lead banks to significantly raise the price of their lending because of the cost of capital is very high.

The liquidity ratio (LIQ) was negative and has a statistical significance at 1 percent, i.e. a one unit increase in LIQ, results in a-2.12 percent decrease in banks' loan and advance facility which means that the high liquidity ratio reduces the proportion of the credit facilities granted by the private commercial banks in Ethiopia. The findings suggested also loan to total assets (NPL) had a significant and negative relationship with the credit facilitation of private commercial banks in Ethiopia. This negative association between nonperforming and commercial lending could be attributed to the fact that, the impact of nonperforming loans on credit facility is both direct and indirect. With the direct effect, deterioration in bank loan assets indicates that banks are taking on higher risks and hence banks cannot build up its risk at minimum levels, they tighten credit standards which will reduce the number of the whole loan applicants as well as successful loan applicants. With the indirect effect, incurring losses from

nonperforming loans demands loan write-offs which deplete the equity capital of banks. This would in-turn affect the banks, ability to extend more loans to their customers, hence leads to reduction in credit facility.

The findings suggested also that both GDP and INF had a significant and positive relationship with the credit facility of private commercial banks in Ethiopia. This shows that lending capacity of private commercial banks in Ethiopia increases during high economic growth and inflation period. Higher inflation can enhance the loan payment capacity of borrower by reducing the real value of outstanding (Nkusu, 2011). Consequently, the collection of the loans and advances according to its repayment schedule increases the lending capacity of the commercial banks. Similarly, an increase in GDP causes raises in both supply and demand for loans.

Market share (MS) had significant and positive with credit facilitation of private commercial banks in Ethiopia. This positive relationship between the market share of asset and credit facilities granted by the private commercial banks in Ethiopia shows that large banks in terms of asset can use their full resources for credit facilities. Deposit growth found to have negative and significant relationship with private commercial banks' lending in Ethiopia. The finding showed that an increase in deposit growth leads to decrees in the lending of private commercial banks in Ethiopia. The reason for this result might be resulted from the high liquidity of the Ethiopia Private commercial banks; therefore, they can fund the loans by reducing the portion of the high liquidity.

NBE bill purchase had statically significant and positive linear relationship with total loan and advance which is deviate from the expected result in this study this relationship show that when loan and advance increase the amount of investment in NBE bill purchase all so increase. The reason for this result might be resulted all private commercial banks to invest 27% of their every new loan disbursements in NBE bills with maturity of five years and Private banks shift their long-term loans to short-term loan to constitute at least 40% of total loans in 2013 (Directive No. MFA/NBE Bills/002/2013 on the other hand lending interest rate (LIR) and Profitability (ROA) has negative and insignificant influence and positive and insignificant influence in determining credit facilities granted by the private commercial banks in Ethiopia respectively.

## 5.3 Recommendations

The empirical findings of the research have prompted the researcher to suggest the following recommendations:

### 5.3.1 Private Commercial Banks

- **Liquidity:** The Ethiopia private commercial banks avoid excessively maintaining the liquidity and seek to employ its cash balances during the expansion of granting credit facilities.
- **Non-performing loans:** The Ethiopia private commercial banks should pay more attention to the ratio of the non-performing loans through following prudent credit policies based on a realistic assessment of the credit risks and avoiding customers with high risks except the presence of sufficient guarantees.
- **Deposit Growth:** Ethiopian commercial banks better give an emphasis and employ various strategies so as to attract and seize deposits and shall focus on term deposit that have special consideration to keep deposit for specified time to decrease high liquidity to have increase the credit facility.

### 5.3.2 Regulatory body

- **Capital Adequacy:** The higher capital requirement would be a compulsory requirement for all Ethiopian commercial banks. Hence, this paper investigates the potential impacts of the implementation of the higher capital requirement on the credit facility of Ethiopian Commercial banks. National Bank of Ethiopia and private commercial banks give relatively little consideration to their capital position to grant high volume of credit.
- **NBE Bill Purchase:** NBE shall continue the policy since NBE bill purchase seems contributed positively to credit facilities granted via moping the excess liquidity holding of banks or providing an opportunity for private banks to invest their excess funds in government securities than the customary practice of holding their liquid asset in zero earning accounts at the National Bank of Ethiopia.

### 5.3.2 Improving Economic Environment

- **Market Share:** In Ethiopia the private commercial banking sector has relatively a few players and the industry still lacks competition. Hence, there is need for the NBE to instill competition in the commercial banking sector in order to create the banking entities with an ability of granting a larger volume of credit facilities
- **GDP Growth rate and Inflation** The study suggests the importance of ensuring and promoting favorable economic situations such as lower inflation rate and sustainable economic growth like GDP per capita which contributes to creating the banking entities with an ability of granting a larger volume of credit facilities

### 5.4 Future Research Recommendations

This study examined the factor affecting private commercial banks loan in Ethiopia by using selected macroeconomic and bank specific variables. However, these variables are not complete. Thus, it is recommended for future researchers to further assess factor affecting the credit facilitation of commercial banks in Ethiopia by incorporating additional bank specific and macro-economic factors. This study focuses only on the supply side of factor affecting the credit facility. Hence, it is also recommended for future researchers to examine it by incorporating the demand side factor. Finally, this study use only secondary data. Therefore, it is recommended for future researchers to study the factor affecting loan of private commercial banks by using primary data or the mixture of primary and secondary data.

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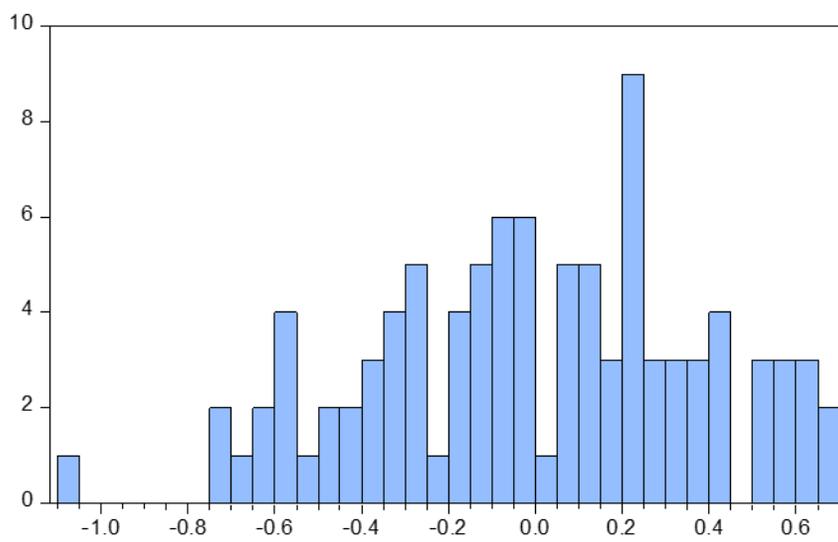
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# APPENDICES

### Appendix 1: Normality Test



<b>Series: Standardized Residuals</b>	
Sample 2000 2015	
Observations 96	
Mean	-4.63e-18
Median	-0.002940
Maximum	0.681351
Minimum	-1.051788
Std. Dev.	0.378046
Skewness	-0.253135
Kurtosis	2.519049
Jarque-Bera	1.950494
Probability	0.377099

Appendix 2: Heteroscedasticity Test: Harvey

Heteroskedasticity Test: Harvey

Version Of Test Value	df	Probability
F-statistic	1.744112	Prob. F(10,85)
Obs*R-squared	16.34449	Prob. Chi-Square(10)
Scaled explaine	12.11731	Prob. Chi-Square(10)

Test Equation:

Dependent Variable: LRESID2

Method: Least Squares

Date: 05/29/17 Time: 15:12

Sample: 1 96

Included observations: 96

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-18.56181	5.367454	-3.458215	0.0009
CAPITAL_ADEQI	-7.156619	6.961855	-1.027976	0.3069
GDP_GROWTH_	7.786039	6.33322	1.229397	0.2223
INFLATION_INF	-0.930495	1.887303	-0.493029	0.6233
LENDING_INTEF	92.74718	36.12928	2.567092	0.012
LIQUDITY	6.251645	2.214459	2.823103	0.0059
LOANS_TO_TOT	7.66919	3.073862	2.494968	0.0145
MARKET_SHARE	-4.785728	4.589431	-1.042771	0.3
PROFITABILITY_I	8.330167	26.83838	0.310383	0.757
NBE_BILL_PURC	0.078521	0.078759	0.996986	0.3216
DEPOSIT_GROW	0.095867	0.944449	0.101506	0.9194
R-squared	0.170255	Mean dependent var		-2.871927
Adjusted R-squ	0.072638	S.D. dependent var		1.922764
S.E. of regressic	1.851615	Akaike info criterion		4.177463
Sum squared re	291.4207	Schwarz criterion		4.471295
Log likelihood	-189.5182	Hannan-Quinn criter.		4.296235
F-statistic	1.744112	Durbin-Watson stat		2.123655
Prob(F-statistic)	0.083926			

### Appendix 3: Breusch-Godfrey Serial Correlation LM Test

#### Breusch-Godfrey Serial Correlation LM Test:

Version Of Test	Value	df	Probability
F-statistic	1.750068	Prob. F(3,82)	0.16320
Obs*R-squared	5.776714	Prob. Chi-Square(3)	0.12300

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 05/29/17 Time: 15:11

Sample: 1 96

Included observations: 96

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CAPITAL_ADEQUACY_CAR	-0.01909	1.604314	-0.0119	0.9905
GDP_GROWTH_RATE	1.72E-01	1.495733	1.15E-01	0.9088
INFLATION_INF	-0.05057	0.468493	-0.10795	0.9143
LENDING_INTEREST_RATE	5.900268	9.313927	0.633489	0.5282
LIQUIDITY	0.159318	0.585397	0.272154	0.7862
LOANS_TO_TOTAL_ASSETS_NP	0.232412	0.703026	0.330588	0.7418
MARKET_SHARE_ASSET	-0.06803	1.062983	-0.064	0.9491
PROFITABILITY_ROA	1.423567	6.127972	0.232306	0.8169
NBE_BILL_PURCHASE	-0.00039	0.017789	-0.02205	0.9825
DEPOSIT_GROWTH	-0.02575	0.21632	-0.11905	0.9055
C	-0.86998	1.42468	-0.61065	0.5431
RESID(-1)	0.186034	0.122218	1.522148	0.1318
RESID(-2)	-0.17728	0.143121	-1.23869	0.219
RESID(-3)	-0.07657	0.120336	-0.63634	0.5263
R-squared	0.060174	Mean dependent var		3.80E-16
Adjusted R-squared	-0.08882	S.D. dependent var		0.40008
S.E. of regression	0.41747	Akaike info criterion		1.224828
Sum squared resid	14.29104	Schwarz criterion		1.598796
Log likelihood	-44.7918	Hannan-Quinn criter.		1.375992
F-statistic	0.403862	Durbin-Watson stat		1.95101
Prob(F-statistic)	0.964645			

Appendix-4 Fixed Effect Regression Outputs

Dependent Variable: LOAN\_LOG\_  
 Method: Panel Least Squares  
 Date: 05/29/17 Time: 15:13  
 Sample: 2000 2015  
 Periods included: 16  
 Cross-sections included: 6  
 Total panel (balanced) observations: 96

Explanatory Variables	Coefficient	Std. Error	t-Statistic	Prob.
Capital Adequacy (CAR)	-3.392811	1.571845	-2.15849	0.0339**
GDP Growth rate (GDP)	5.715575	1.456459	3.924296	0.0002*
Inflation (INF )	1.314891	0.42469	3.096117	0.0027*
Lending Interest rate (LIR)	-17.19958	8.710949	-1.97448	0.0518***
Liquidity(LIQ)	-2.123135	0.661853	-3.20786	0.0019*
loan to Total Assets(NPL)	-3.431099	0.839638	-4.0864	0.0001*
Market Share Asset (MS)	5.140693	2.233334	2.301802	0.0239**
Profitability(ROA)	11.05034	6.207892	1.780047	0.0789***
NBE Bill Purchase (BILL)	0.096281	0.019284	4.992847	0.0000*
Deposit Growth (DG)	-1.093206	0.237172	-4.60934	0.0000*
Constant	10.58854	1.349288	7.847503	0.0000*
R-squared	0.895346	Log likelihood		-42.332540
Adjusted R-squared	0.875723	F-statistic		45.62815
S.E. of regression	0.411966	Prob(F-statistic)		0.00000
Sum squared resid	13.5773	Durbin-Watson sta		1.5430

**Note** \* Significant at 1% \*\* Significant at 5% , and \*\*\* Insignificant



