

Addis Ababa
University

(Since 1950)



ADDIS ABABA UNIVERSITY COLLEGE OF BUSINESS & ECONOMICS

**DETERMINANTS OF COMMERCIAL BANKS LENDING
DECISION IN ETHIOPIA: A CASE STUDY ON SELECTED
PRIVATE BANKS.**

**BY:
DEREJE TSEGAYE**

**A THESIS SUBMITTED TO THE COLLEGE OF BUSINESS
& ECONOMICS OF ADDIS ABABA UNIVERSITY IN
PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR
THE DEGREE OF MASTER OF BUSINESS
ADMINISTRATION IN FINANCE.**

**JUNE, 2018
ADDIS ABABA
ETHIOPIA**

**ADDIS ABABA UNIVERSITY
COLLEGE OF BUSINESS & ECONOMICS
(MBA GRADUATE PROGRAM)**

**DETERMINANTS OF COMMERCIAL BANKS LENDING
DECISION IN ETHIOPIA: A CASE STUDY ON
SELECTED PRIVATE BANKS.**

**By
DEREJE TSEGAYE**

Approved by the Board of Examiners

Advisor: Mr. G/Medhin G/Hiwot Signature _____ date _____

Internal Examiner: Dr. Habtamu B. Signature _____ date _____

External Examiner: Dr. Demessew D. Signature _____ date _____

JUNE, 2018
ADDIS ABABA
ETHIOPIA

Abstract

Loan portfolio is the largest asset and source of revenue for banks. Therefore, its administration requires considerable skill and dexterity on the part of the bank management. The main objective of this study was to identify the determinants of lending decision of private commercial banks in Ethiopia. In order to achieve the research objectives, data was collected from a sample of ten private commercial banks over the period from 2009 to 2017. Bank specific and macroeconomic variables were analysed by using the balanced panel random effect regression model. Nine variables that affect banks' lending decision were selected and analyzed with E-views version 9. Estimation results showed that bank size(BSIZ), real GDP growth rate(GDP) and exchange rate (EX) were positive and statistically significant while investment portfolio, volume of deposit, liquidity ratio and inflation rate were found to be statistically significant with negative effects respectively on total loans and advanced by private commercial banks in Ethiopia. However, credit risk ratio and cash reserve requirement ratio were statistically insignificant at all levels with positive and negative effects on private commercial banks lending decision respectively. Therefore, private commercial banks should adjust their lending decision in response to the signals from these factors, such that positive signals like bank size(BSIZ), real GDP growth rate(GDP) and exchange rate (EX) in this study make banks become more favorably disposed to lending and vice versa.

Key Words: Lending decision, Loans and Advances, Bank size, Deposit, Exchange rate

Acknowledgements

Firstly, I want to express my gratitude to Almighty God who gave me power and patience in every endeavor of my life. Next, I am grateful to my advisor, Mr. G/Medhin G/Hiwot for his support, supervision and valuable guidance in writing my thesis. Lastly, I say a big thanks to my friends and every other person who encouraged me, prayed for me and patiently stood by me throughout my thesis.

Table of Content.....	Page
Abstract.....	II
Acknowledgements.....	III
List of Tables	VII
List of Figures	VIII
List of Acronyms.....	IX
CHAPTER ONE	1
INTRODUCTION.....	1
1.1. Background of the study.....	1
1.2. Statement of the problem	4
1.3. Objective of the study.....	6
3.3.1. General objective	6
3.1.2. The specific objectives of study are:.....	6
1.4. Research questions	6
1.5. Hypotheses of the study	6
1.6. Significant of the study	7
1.7. Scope of the study	7
1.8. Limitation of the study.....	8
1.9. Organizations of the.....	8
CHAPTER TWO	9
LITERATURES REVIEW	9
2.1. Introduction	9
2.2. Theoretical and Conceptual literature review	9
2.2.1. Theoretical Framework.....	9
2.2.2. Conceptual literature review	12
2.3. Empirical Literatures	14
2.4. Summary of literature review and knowledge Gap.....	18
CHAPTER THREE	20
RESERCH METHODOLOGY.....	20

3.1.	Introduction	20
3.2.	Research design and approach	20
3.3.	Sample Design.....	20
3.4.	Sampling techniques and Sampling Size	21
3.5.	Nature of data, source of data and data collection techniques	21
3.6.	Study Variables and research hypotheses	22
3.6.1.	Dependent Variable	22
3.6.2.	Independent Variables.....	23
3.7.	Data analysis and Interpretation	33
3.8.	Specification of the Model.....	33
CHAPTER FOUR		37
RESULTS AND DISCUSSIONS.....		37
4.1.	Descriptive statistics	37
4.2.	Correlation analysis.....	39
4.3.	Testing the Classical Linear Regression Model (CLRM) Assumptions.....	41
4.3.1.	Testing for the Average value of the error-term is zero	42
4.3.2.	Test for heteroskedasticity assumption ($\text{var}(u_t) = \sigma^2 < \infty$)	42
4.3.3.	Test for absence of autocorrelation assumption ($\text{cov}(u_i, u_j) = 0$ for $i \neq j$).....	43
4.3.4.	Test of normality ($u_t \sim N(0, \sigma^2)$)	43
4.3.5.	Test for multicollinearity.....	45
4.4.	Choosing Random effect (RE) Vs fixed effect (FE) models.....	45
4.5.	Regression analysis results and its Interpretation	47
4.5.1.	Interpretation of Regression Results	48
4.6.	Summary of the discussions.....	53
CHAPTER FIVE		55
CONCLUSIONS AND RECOMMENDATIONS.....		55
5.1.	CONCLUSIONS.....	55
5.2.	Recommendations	56
5.3.	Future Research Recommendations.....	57
REFERENCE.....		58
APPENDIXES		63
Appendix-1: Descriptive statistics of study variables over the period of 2009-2017		63

Appendix-2: Correlation Matrix of Dependent and Independent Variables	63
Appendix-3: Heteroskedasticity Test	63
Appendix-4: Autocorrelation Test.....	64
Appendix-5: Normality Test	65
Appendix-6: Multicollinearity test	65
Appendix-7: Correlated Random Effects - Hausman Test	66
Appendix-8: Random effects model regression results.....	67

List of Tables

Table No	Table descriptor	Page
Table 3.1:	Description of the variables used in the regression model	35
Table 4.1:	Descriptive statistics of study variables over the period of 2009-2017.....	37
Table 4.2:	Correlation Matrix of Dependent and Independent Variables	40
Table 4.3:	Heteroskedasticity Test.....	42
Table 4.4:	Autocorrelation Test: Breusch-Godfrey Serial Correlation LM Test	43
Table 4.5:	Correlations matrix of explanatory variables	45
Table 4.6:	Correlated Random Effects - Hausman Tes	46
Table 4.7:	Random effects model regression results of the study	48
Table 4.8:	Summary of actual and expected signs of explanatory variables on the dependent variables	54

List of Figures

Figure No	Figure descriptor	Page
Figure 2.1:	Conceptual framework	19
Figure 4.1:	Normality test for residuals	44

List of Acronyms

AB - Awash Bank S.C
BOA - Bank of Abyssinia S.C
BSIZ - Bank size
CBO - Cooperative Bank of Oromia S.C
CRR - Cash Reserve Requirement Ratio
CR - Credit Ratio
DB - Dashen Bank S.C
EX - Exchange Rate
GDP - Gross Domestic Product
INFR - Inflation Rate
IP - Investment portfolio
LB - Lion Bank S.C
LOA - Loans and Advances
LR - Liquidity Ratio
NBE - National Bank of Ethiopia
NB - Nib Bank S.C
NPLs - Nonperforming Loans
OIB - Oromia International Bank S.C
OLS - Ordinary Least Square
PCBs – Private Commercial Banks
UB - United Bank S.C
VD - Volume of Deposit
WB - Wegagen Bank S.C
ZB - Zemen Bank S.C

CHAPTER ONE

INTRODUCTION

1.1. Background of the study

The banking system is the engine of growth in any economy given its function of financial intermediation, provision of an efficient payment system and facilitating the implementation of monetary policies (Ugwuanyi, 2014). They are regarded as the cornerstone of the economy of a country (Adegboyega, 2012) as they play a crucial role in propelling the entire economy (Owolabi and Ajayi 2013). It is also worth to note that commercial banks in most of the world economies are dominant type of financial institution that provides installment, facilitates the internal and external trade and the movement of money and capital when compared to any other financial institution (Greuning & Bratanovic, 2003) and (Saini & Sindhu, 2014). As indicated by Lartey et al. (2013) the business of banking involves the mobilization of funds from excess or surplus units of the economy and giving out to deficit unit as loans and advances. According to (Olusanya, Oyebo and Ohadebere(2012), the realization by the surplus economic unit that their excess could be used beneficially to meet the shortfalls experienced by the deficit economic unit led to the introduction of a credit system. Olusanya, Oyebo and Ohadebere added that this system was initially characterized by direct financing in which the lenders (surplus units) and borrowers (deficit unit) would have to search out themselves and deal directly. Indirect financing includes the aggregation of deposits from various households, firms and gov-ernment by commercial banks for lending to the deficit unit. The repayment of the loan is made to the bank which also stands ready to redeem deposits withdrawals by the surplus unit.

If banks are effective, efficient and disciplined, it brings about rapid growth in the various sectors of the economy as well as brings economic stability. For the survival of banks, effective lending is crucial. 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 (Read and Gill, 1989).

Bank loans are one of the most important long-term financing sources in many countries. 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 realised that banks have the potential, scope and prospects for mobilizing financial resources and allocating them to productive investments (Olokoyo, 2011). Since 1963 commercial banks in Ethiopia perform several banking business like attracting all types of deposit and granting loan and advance to borrowers for the sake of increasing their investment capacity. As a result commercial bank plays a great role for the growth of the economy by maintaining three main operating guiding principles, which are profitability, liquidity and solvency. Hence, cash required reserve become an alternative way to maintain banks liquidity. Consequently, national bank of Ethiopia set this requirement. Nevertheless, these policies or requirements are at the center of an intense national debate (Mitku M., 2014). 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, banks liquidity ratio, prestige and public recognition to mention a few (Olokoyo 2011). Moreover, lending decision of commercial Banks may also depends on type of bank, the capital base, the deposit base and density of the deposit, the credit guidelines issued from time to time by the controlling authority and internal policies of the banks since loans and advances accounts for the highest percentage of the total assets of the banks. Though these factors or policies are internal, they, however, to a large extent mimic the general macroeconomic environment, such that the general loan behavior of banks will be a reflection of the signals from the aggregate economy.

Expectedly, if they perceive a stable macro environment they form an expectation that the borrowers will be able pay back because of their ability to predict the economy more accurately and possibly earn a good return on their investment projects. Therefore, since banks do not operate in a vacuum, their overall lending behavior may generally be influenced by the environmental factors particularly the regulatory and macroeconomic factors. The regulatory environment is more stringent and must be observed but the economic environment is perhaps the more challenging since it affords them the opportunity to exercise their discretion at Least relatively, in a manner that will impact positively on their business in the long run.

The economic environment is a systematic risk component that affects every participant within the economy. The general performance of the economy is reflected by the macroeconomic aggregates including the gross domestic product (GDP), industrial capacity utilization, inflation, money supply and exchange rate. Banks therefore adjust their lending behavior in response to the signals from these factors, such that positive signals make banks become more favorably disposed to lending and vice versa. Thus, banks' loan portfolio including volume, tenor and structure are generally influenced by their expectations of the performance of economy both in terms of stability and quantum (level of performance).

In general this transformational process of banks, loans and advance is the most profitable and liquid asset for the bank to maintain its maximum liquidity obligation to their depositors or lenders; banks do not invest its entire fund in a profitable asset (Nwankwo, 2000). Bank accept customer deposits and use that fund to grant loans to borrowers or invest in other assets that will yield a return higher than the amount bank pays the depositor (McCarthy et al., 2010). It is understandable that, the main source of lending is deposit or money accepted from the depositor but the amount that would have to be lent is a certain percentage of the total deposited amount and the remaining is kept as a reserve for the purpose of maintaining its liquidity. Although bank's loan portfolio is the main means of income for the bank, commercial banks in Ethiopia do not invest their entire resources in this profitable asset rather they keep a portion of its resources idle to meet cash required reserve(NBE, 2016, Annual report). The number of banks operating in Ethiopia remained 18 of which 16 were private banks. Total capital of the banking system reached Birr 49.4 billion in 2017, depicting 20.1 percent annual growth. Of the total capital of the banking system, private banks accounted for 47.6 percent while that of Commercial Bank of Ethiopia and Development Bank of Ethiopia stood at 32 percent and 20.4 percent respectively thereby putting the total capital share of the two public banks at 52.4 percent. During the review quarter, the banking sector disbursed Birr 25.33 billion in new loans, indicating a 42 percent annual growth. Of the total new loans disbursement, the share of public banks was 46.9 percent while that of private banks was 53.1 percent. Total outstanding credit of the banking system (excluding credit to central government and interbank lending) increased to Birr 314.21 billion depicting a 22.6 percent growth over last year same period. About 99.9 percent of the private banks and 52.2 percent of public banks loans went to finance the private sector (National Bank of Ethiopia annual report 2015/16).

1.2. Statement of the problem

Lending is the main business of the commercial banks. Loan portfolio is the largest asset and source of revenue for banks (Comptroller, 1998). Therefore, its administration requires considerable skill and dexterity on the part of the bank management. Lending practices in the world could be traced to the period of industrial revolution which increase the pace of commercial and production activities thereby 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 (Ezirim, 2005).

Similarly, in the contemporary period it is a widely accepted fact that lending is a main service of commercial banks which contributing to economic growth and development, since the capital outlays needed for most developmental projects comes mainly from banks. Indeed, this lead to the fact that the importance of banks is more pronounced in developing countries because financial markets are usually underdeveloped, and banks are typically the only major source of finance for the majority of investments and are usually the main depository of economic savings (Arun & Turner, 2004).

Commercial banks with well conceptualized lending and credit administration policies and procedures can survive the in emerging competition of developing countries banking industry like Ethiopia. In view of the significant contribution of loans to the financial health of banks through interest income earnings, these assets are considered the most valuable assets of banks. Thus “lending is undoubtedly the heart of banking business” (Adedoyin and Sobodun (1996) pp. 36 – 37.). So that lending must be handled effectively for the banks to remain attractive and retain their customers.

Loans and advance is the most profitable and liquid asset for the bank to maintain its maximum liquidity obligation to their depositors or lenders; banks do not invest its entire fund in a profitable asset (Nwankwo, 2000). In order to functions this maturity transformation, banks accept deposit from its customers in the form of saving and in turn it pays interest to depositors on their deposits. Banks then convert these deposits into loans and lend them to its clients at a higher rate and usually longer duration in order to bring financial costs down. Although it is understandable that, the main source of lending is deposit or money accepted from the depositor but the amount that would have to be lent is a certain percentage of the total deposited amount

and the remaining is kept as a reserve for the purpose of maintaining its liquidity. Thus, through transforming short-term deposits into long-term investments, the banking system as a whole creates credit which extended to individuals, companies and government (Kapoor, 2013). Banks mostly transform liquid assets like deposits into illiquid assets like loans (Diamond and Rajan, 1998).

Commercial banks are the most important savings, mobilization and financial resource allocation institutions (Olumuyiwa 2012). For the banks to balance their main objectives of liquidity, profitability and solvency, lending must be handled effectively and the banks must behave in a way that their potential customers are attracted and retained in order to have the best lending practice and behavior. However, the sound and viable functioning of commercial banks decisions to lend out loans are influenced by a lot of factors such as the prevailing interest rate, the volume of deposits, investment portfolio, banks liquidity ratio, cash reserve requirement ratio, economic growth, and inflation to mention a few. Moreover, lending of commercial bank may also depend on type of bank, the capital base, the deposit base and density of the deposit, the credit guidelines issued from time to time by the controlling authority and internal policies of the banks since loans and advances accounts for the highest percentage of the total assets of the banks. There is a need to ensure that banks focus on their core business which is debt financing managed at arm's length.

Accordingly, banking industry in Ethiopia has its own unique features that distinguish them from other countries financial market. One of the features is the regulation of the country does not allow foreign nations or organization to fully or partially acquire share of Ethiopian banks. Besides, there is no secondary market. Moreover, in the country, a rapidly growing industry is the banking sector. As a result, it is visible to conduct a study on the determinants of commercial banks lending in Ethiopia which is crucial.

In addition to the above facts, this study seeks to incorporate additional bank specific and macro-economic factors; by establishing other determinants such as credit risk, annual average exchange rate of the birr to dollar, investment portfolio, inflation rate, bank size, volume of deposit, liquidity ratio, cash reserve requirement, and gross domestic product on more than fifty percent selected private commercial banks from total sixteen commercial banks in Ethiopia attempted to fill the existing research gap. Further from the studies the determinants of

commercial banks lending is inconclusive with some researcher finding insignificant effect while others establishing significant influence on the same variables at the same period even in Ethiopia. Moreover, in the recent past, there have been many changes in the country that substantially influenced the economic environment as well as the business climate. Apart from the economic growth and environmental changes registered by the country within the last few years, the Bank has also undergone changes in its lending procedures by considering 15 percent birr devaluation against major hard currencies, according to the NBE annual report 2017, the minimum interest rate has increased to seven percent from the current five percent. This study therefore fills the gap in respect of the variables considered in the study and it is further believed that such a study with complete recognition of all factors would contribute to policy making and devise risk mitigating mechanisms.

1.3. Objective of the study

3.3.1. General objective

The main objective of this study is to establish the main determinants of private commercial banks lending decision in Ethiopia.

3.1.2. The specific objectives of study are:

1. To determine the impact of bank specific determinants of lending decision on the private commercial banks' lending decision in Ethiopia.
2. To determine the impact of macroeconomic determinants of lending decision on the private commercial banks' lending decision in Ethiopia.

1.4. Research questions

1. What is the impact of bank specific determinants of lending decision on the private commercial banks' lending decision in Ethiopia?
2. What is the impact of macroeconomic determinants of lending decision on the private commercial banks' lending decision in Ethiopia?

1.5. Hypotheses of the study

In order to achieve the objectives of the study and to answer clearly on the problem statement, the following null hypotheses was developed to estimate the sign relationship of bank specific

and macroeconomic determinants of lending on the private commercial banks' lending decision in Ethiopia based on empirical evidence reviewed in the literature parts in a way that were tested to arrive at reliable scientific results and generalize them. The following hypotheses were tested:

H1: Credit risk has negative impact on banks "loan and advance"

H2: Investment portfolio has positive impact on banks "loan and advance"

H3: Bank size has positive impact on banks "loans and advances"

H4: Volume of deposit has positive impact on banks "loans and advances"

H5: Liquidity ratio has negative impact on banks "loan and advance"

H6: Cash reserve requirement has negative impact on banks "loan and advance"

H7: Gross Domestic Product (GDP) growth has positive impact on banks "loan and advance"

H8: Inflation rate has negative impact on banks "loan and advance"

H9: Exchange rate has positive impact on banks "loan and advance"

1.6. Significant of the study

This study can help the bank to take it as an input in identifying major determinants of private commercial banks lending decision, which are more susceptible for discrepancies and fraud. Besides, it can help the Ethiopian private commercial banks management to assess their lending requirement and to relook their lending policy and to give due attention on those factors which have significant impact on commercial banks lending decision and it can enable the bank sector to give more attention on determinants of commercial banks lending to maximize their profit with given risk level.

1.7. Scope of the study

This paper is confined in identifying the determinants of commercial banks lending on Ethiopian private commercial banks. Though there are sixteen private commercial banks in Ethiopia, the study is focus only on ten selected privately owned commercial banks that have at least nine years of experience at the end of December 31, 2017 which the result may not represent the whole population. The study covered a span of nine years that was from 2009 -2017; the time

span is reflect the trend that can be relied on both for projections and as representations of the entire population.

1.8. Limitation of the study

The ability to get data and annual reports from selected private banks and NBE posed limitation. These limitations notwithstanding, it is my belief that findings from this study are quite valid. For developing countries like Ethiopia, the availability of data continues to be a challenge for researchers, as it was found to be the case in the this study. Due to this some variables in the empirical model had to be excluded such as NPL and lending interest rate. The drawback of such measures is that, the quality of estimated results could be reduced.

1.9. Organizations of the

This thesis comprises of a total of five chapters. The first chapter provided the general overview of the study. The second chapter reviews the related literatures on the determinants of private commercial banks lending decision in Ethiopia. The third chapter focuses on the methodology of the study. The fourth chapter is providing results and discussion. The final chapter included conclusion and recommendations and at the end references and appendixes were attached.

CHAPTER TWO

LITERATURES REVIEW

2.1. Introduction

A literature review scrutinizes recent or historically significant research studies, company data or industry reports that act as the basis for the proposed study. It is a body of text that aims to review the critical points of current knowledge on a particular topic. This chapter was bring together diverse streams of literature that touched on the determinants of commercial banks lending decision from both locally and internationally empirical review.

2.2. Theoretical and Conceptual literature review

2.2.1. Theoretical Framework

➤ *Loan pricing theory*

This asserts that banks cannot always set high interest rates. Therefore, in trying to earn maximum interest income banks should consider the problems of adverse selection and moral hazards since it is very difficult to forecast the borrower type at the start of the banking relationship (Stiglitz and Weiss, 1981) given the high credit market information asymmetry. 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 behaviour since they are likely to take a highly risky projects or investments (Chodecal, 2004). It argued that at times it may be difficult to find interest rate set by bank which commensurate with the risk of the borrowers. This theory suggests that loans advanced to the public may or may not increase in the end.

➤ *Credit Market Theory*

The neoclassical credit market model suggests that the terms of credits clear the market. In this model, the interest rate is the only price mechanism that can clear the credit market given that the loan collateral remains constant. With a growing demand for credit and a given loan and advances supply by the banks, the interest rate can only rise if the credit market is clear, and the

reverse is true. The higher the default risks of the borrower, the higher the interest premium (wEert et al., 2000) so as to compensate against any possible losses. The increase in demand for credit brought about by low interest rates eventually may lead to depreciation of currency. Central bank therefore must adjust the interest rate to increase the cost of borrowing. Commercial banks in their turn must increase their rates and therefore thus contracting their lending activities in the long run. Although, central bank requires banks to deposit a certain amount of money with them, increased cash requirement ratio also acts as a mechanism of restricting credit available taking consideration of macro-economic environment (Vazakidis and Adamopoulos, 2009). According to Bolton and Freixas, (2001), this leaves commercial banks with close to no alternative other than lowering lending volumes.

➤ ***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 bank's lending capacities, thus reducing their need of greater diversification and monitoring through share lending (Carletti et al, 2006; Ongene & Smith, 2000; Karceski et al, 2004; Degryse et al, 2004).

➤ ***Moral Hazard Theory***

Moral hazard occurs when a contract is executed among two parties. The two types of moral hazard are hidden information and hidden action (Arrow, 1985). Hidden information occurs when one contract party does not unveil the full range of his or her options and the consequent risk factors. Hidden action occurs when one contract party chooses options that are not in the interest of the counterparty and cannot be observed and managed thus moral hazard may arise .In relation to credit markets and analyzing the lender-borrower relationship in more detail, the financial institutions may not have the capacity to ensure that the borrower invests the borrowed loan in productive investments and as a result of this information asymmetry, the borrower may decide to invest in risky projects leading to defaulting. (Diamond, 1984; Breuer, 1995)

The moral hazard problem implies that a borrower has the incentive to default unless there are consequences for his future applications for credit. This result from the difficulty lenders have in assessing the level of wealth borrowers will have accumulated by the date on which the debt must be repaid, and not at the moment of application. If lenders cannot assess the borrowers'

wealth, the latter will be tempted to default on the borrowing. Forestalling this, lenders will increase rates, leading eventually to the breakdown of the market Alary & Goller (2001).

➤ ***Signaling, Bankruptcy and Risk Return Theories***

These theories were proposed by Berger (1995). Under the signalling hypothesis Trujillo-Ponce (2012) note that private information on whether there are future prospects that are good is signalled by bank management. According to signalling hypothesis, the higher the capital and volume deposited in banks, there will be a positive sign for the bank (Ommeren, 2011; Tomola, 2013). Therefore, a lesser leverage shows that banks perform better compared to other market as well as participants who cannot raise their equity without weakening commercial banks' productivity maybe through defaulting.

Berger, (1995) posits that according to the bankruptcy theory, more equity is held by a bank to avoid distress periods where bankruptcy costs are all of a sudden high. In this case, both the signalling and bankruptcy cost hypotheses maintain existence of a positive relationship between capital and resources (assets) owned by commercial bank (Ommeren, 2011; Tomola, 2013). According to Olokoyo (2011) lending behaviour is significantly influenced by deposits. Thus to enhance the lending activities, the study suggests that commercial banks should pay attention to increase mobilization of more deposits.

According to the risk-return hypothesis, higher expected returns are as a result of cumulating risks through increasing leverage of the firm. Following this theory, there is a need to take up more risks by increasing leverage and consequently increase the amount of loans to the general public (credit) if commercial banks expect increased returns. This action is expected to lower the bank capital. Based on this theory, a negative relationship is predicted between capital and return on equity (Ommeren, 2011; Sharma and Gounder, 2012, and Tomola, 2013).

As posited by different theories, bank's lending behaviour is a culmination of a number of factors both external and internal to the bank. However, each theory addresses effects of a certain identical variables on lending behaviour by banks (Ewert et al., 2000) lower interest rates to large segments of small and medium.

2.2.2. Conceptual literature review

Money and credit are not simply offered by injection from some authorities in order to serve the needs of the economy "in exchanging goods already produced." Credit and finance come into existence because time is a device that prevents everything from happening at once. Production processes take time; hence, the decision to organize production in a certain manner must occur earlier than the outcome. As Davidson (1978) explains, the economic system is characterized by three essential elements: The first is the existence of uncertainty. The future is unknown and unpredictable, and consequently economic agents' expectations can be easily frustrated. The second is the existence of irreversible time, where production takes time and economic agents enter into commitments well before outcomes can be predicted. The third, closely related to the second, is that economic agents commit themselves to contracts dominated by money. Therefore, money and contracts are intimately and inevitably related.

The banking system is the engine of growth in any economy given its function of financial intermediation, provision of an efficient payment system and facilitating the implementation of monetary policies (Ugwuanyi, 2014). They are regarded as the cornerstone of the economy of a country (Adegboyega, 2012) as they play a crucial role in propelling the entire economy (Owolabi and Ajayi 2013). It is also worth to note that commercial banks in most of the world economies are dominant type of financial institution that provides installment, facilitates the internal and external trade and the movement of money and capital when compared to any other financial institution (Greuning & Bratanovic, 2003) and (Saini & Sindhu, 2014). The primary role of a bank is intermediation by way of collecting savings from depositors and making these savings available as loans to borrowers. 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 et al., 2010). Thus, 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 the 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 (Iwedi & Onuegbu, 2014) and (Kishan & Opiela, 2000). It is argued that banks cannot compensate an increased failure risk by charging higher interest rates (Stiglitz and Weiss, 1981). This therefore prompts any financial institution to

request for collateral from the borrower to minimise losses that might occur from loan defaults. It follows that customers' deposit is the primary source of bank loan and hence, increasing or guaranteeing deposits directly has a positive effect on lending. In performing this function, banks are regulated often by the environment within which they operate.

Lending practices in the world could be traced to the period of industrial revolution which increases the pace of commercial and production activities thereby 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. Similarly, in the contemporary period this function constitutes the major share among the functions of commercial banks. However, there are challenges experienced for banks to experience growth. This is because of exposure to risks while performing their roles. By solving the problem of asymmetric information among agents and by diversifying risks, Banks manage to reduce costs that would be incurred on the exchange of financial funds. This therefore enables their efficient allocation of financial resources within the economy (King and Levine, 1993; Olusanya, 2012). Economic decisions related to consumptions and investments are thus made possible through the financial system since it is aimed at increasing productivity growth of the economy (Karimi, 2006). If banks are effective, efficient and disciplined, it brings about rapid growth in the various sectors of the economy as well as brings economic stability. For the survival of banks, effective lending is crucial.

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 (Read and Gill, 1989). Lending represents the heart of the industry. Therefore, its administration requires considerable skill and dexterity on the part of the bank management". While a bank is irrevocably committed to pay interest on deposits it mobilized from different sources, the ability to articulate loanable avenues where deposit funds could be placed to generate reasonable income; maintain liquidity and ensure safety requires a high degree of pragmatic policy formulation and application (Adedoyin and Sobodun , 1996). Loans are the dominant asset and represent 50-75 percent to total amount at most banks, generate the largest share of operating income and represent the banks greater risk exposure (Mac Donald and Koch, 2006). Banks have to be careful with their pricing decisions as

regards to lending as banks cannot charge loan rates that are too low because the revenue from the interest income will not be enough to cover the cost of deposits, general expenses and the loss of revenue from some borrowers that do not pay(Chodechai, 2004). Moreover, charging too high loan rates may also create an adverse selection situation and moral hazard problems for the borrowers

Accordingly, banking industry in Ethiopian has its own unique features that distinguish them from other countries financial market. One of the feature is the regulation of the country is not allowed foreign nations or organization to fully or partially acquire share of Ethiopian banks. Besides, there is no secondary market. Moreover, in the country, a rapidly growing industry is the banking sector. As a result, it is visible to conduct a study on the determinants of lending behaviour of commercial banks in Ethiopia which is crucial.

2.3. Empirical Literatures

The supply of bank loans is usually expressed as a function of both internal and external determinants. The internal determinants are termed micro- or bank-specific determinants of bank lending, while the external determinants are variables that are not related to bank management but reflect the monetary, economic and legal environment that affect the operations and performance of financial institutions.

Chodechai (2004) has investigated the factors that affect interest rates, degree of lending volume and collateral setting in loan decisions of banks, stated that banks have to be careful with their loan pricing decisions. Because if banks charge too loan rates the revenue from the interest income will not be enough to cover the cost of deposits, general expenses and the loss of revenue from some borrowers. Hence, charging too high loan rates may also create an adverse selection situation and moral hazard problem for the borrowers.

Aisen and Franken (2010) indicated that the rate of growth in the bank credit before the financial crisis was higher than in the financial crisis through the application of a sample of 80 countries. The study also found that the cyclical fluctuations in the monetary policy and the liquidity position of the banks have played a major role in the reduction of the bank credit provided after the financial crisis, which calls for the need that countries should follow economic and monetary structure accompanying the financial policies to face fluctuations. The results also indicate that

countries have responded differently to the financial crisis because of the diversity in their structural characteristics, such as the financial depth and integration.

Olokoyo (2011) investigated the determinants of commercial banks' lending behavior in the Nigerian context. The study was aimed to test the determinants of commercial banks 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 (LOA) and other determinants or variables such as their volume of deposits (Vd), their investment portfolio (Ip), interest (lending) rate (Ir), stipulated cash reserve requirements ratio (Rr) and their liquidity ratio (Lr) for the period; 1980 – 2005. The model hypothesizes that there is 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 banks deposits have the greatest impacts on their lending behavior.

Djiogap and Ngomsi (2012) investigated the determinants of bank long term 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.

Olumuyiw(2012) took a look at determinants of lending behavior of commercial banks in Nigeria: a Co-integration analysis between 1975 to 2010. The study used secondary data and series of econometrics techniques to justify the long run relationship between Commercial bank and its lending behavior over the period of analysis. Moreover, the study investigates the level of commercial banks 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 (LOA) and other determinants such as Volume of deposits (Vd), annual average exchange rate of the naira to dollar (Fx) for the period of thirty-seven (37) years, Investment Portfolio (Ip), Interest rate (lending rate) (Ir), Gross domestic product at current market price (Gdp) and Cash reserve requirement ratio (Rr). 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.

Jonas et al. (2013) investigated the determinants of bank lending behavior in Ghana. Using the GMM-System estimator developed by Arellano and Bover (1995) and Blundell and Bond (1998), found that bank size and capital structures have a statistically significant and positive relationship with bank lending behavior. Also find evidence of negative and significant impact of some macroeconomic indicators (central bank lending rate and exchange rate) on bank lending behavior. Again, competition in the industry was found to have a positive and significant impact on bank lending behavior. Finally, relationship banking was found to have a positive correlation with bank lending behavior in Ghana. Thus, policies aimed at maintaining stable macroeconomic fundamentals would greatly accelerate bank lending decision.

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 bank's business loans performance depends on its size, total liabilities, non performing loans to total loans (NPL) and inflation rate.

Amano (2014) in his study examined the determinants of commercial banks' lending behaviour in Ethiopian. The study applied the balanced fixed effect panel data of eight commercial banks in Ethiopian that covers the period 2001- 2013. The study used Ordinary Least Square (OLS) technique to investigate some internal as well as external variables that determine the lending decision of commercial banks' in Ethiopia and use loans and advances as dependent variable. The estimation results showed that volume of deposit and bank size had positive and significant impact on loan and advance. Liquidity ratio and interest rate had negative and significant impact on loan and advance. Cash reserve requirement, and inflation rate had positive and significant impact on loan and advance but the coefficient sign was not as expected. Finally, real GDP growth rate had statistically insignificant impact on bank's loan and advance.

Mitiku (2014) investigated the main determinants of commercial bank lending in Ethiopia by using panel data of 8 commercial banks in the period from (2005 - 2011). It 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) was applied to determine the impact of those predictor variables on commercial bank lending. The results suggest that there is 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 does not affect Ethiopian commercial bank lending for the study period. And also the study suggests that commercial bank have to give more emphasis to credit risk and liquidity ratio because it weakens bank loans disbursement and leads a bank to be insolvent.

Mohammed A. (2014) analysed 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 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 sever entry requirements and requires high regulatory capital, influences bank's decisions to supply loans.

Alkilani and Kadummi (2015) found that lending behavior is statistically significant affected by internal factors (deposit volume, lending rate, net profit after tax) and it is also affected signficated by external factors (reserve requirements, gross domestic product, inflation rate, OWDR, red), also the analysis indicated that (overnight window deposit rate and rediscount rate) red as a proxy of monetary policy did a have a negative impact on lending behavior but not significantly proven. The study also reached to a conclusion that the amount of loans and advances extended by Jordanian banks is not affected by the rate of interest.

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

ratio of credits facilities, while he found that the bank size and the economic growth have a positive and significant impact on the ratio of credits facilities granted by commercial banks in Jordan.

Berhanu, (2016) studied determinants of lending decision and their impact on financial performance of commercial banks in Ethiopia by using panel data of six private commercial banks in the period from (2001....2015). He tested the relationship between commercial bank lending and its some determinants (Volume of Deposit, Asset Quality, Liquidity Ratio, Cash Reserve Requirement, Capital Adequacy Ratio, Lending Interest Rate, Inflation, and Gross Domestic Product) and their impact on financial performance the bank. Ordinary least square (OLS) was applied to determine the impact of those predictor variables on commercial bank lending and their impact on financial performance of the bank. The results suggest that there is positive and significant relationship between commercial bank lending and its capital adequacy and liquidity. But nonperforming loans, lending interest rate and cash reserve requirement factors that negatively and significantly affect the lending of private commercial banks in Ethiopia. And also the results suggest that bank lending had a positive as well as negative impact on the financial performance of private commercial banks in Ethiopia depends on the factors affecting the lending decision of the banks. The study also reached to a conclusion that the banks should exert additional effort to properly manage their loan portfolio order to enhance their profitability.

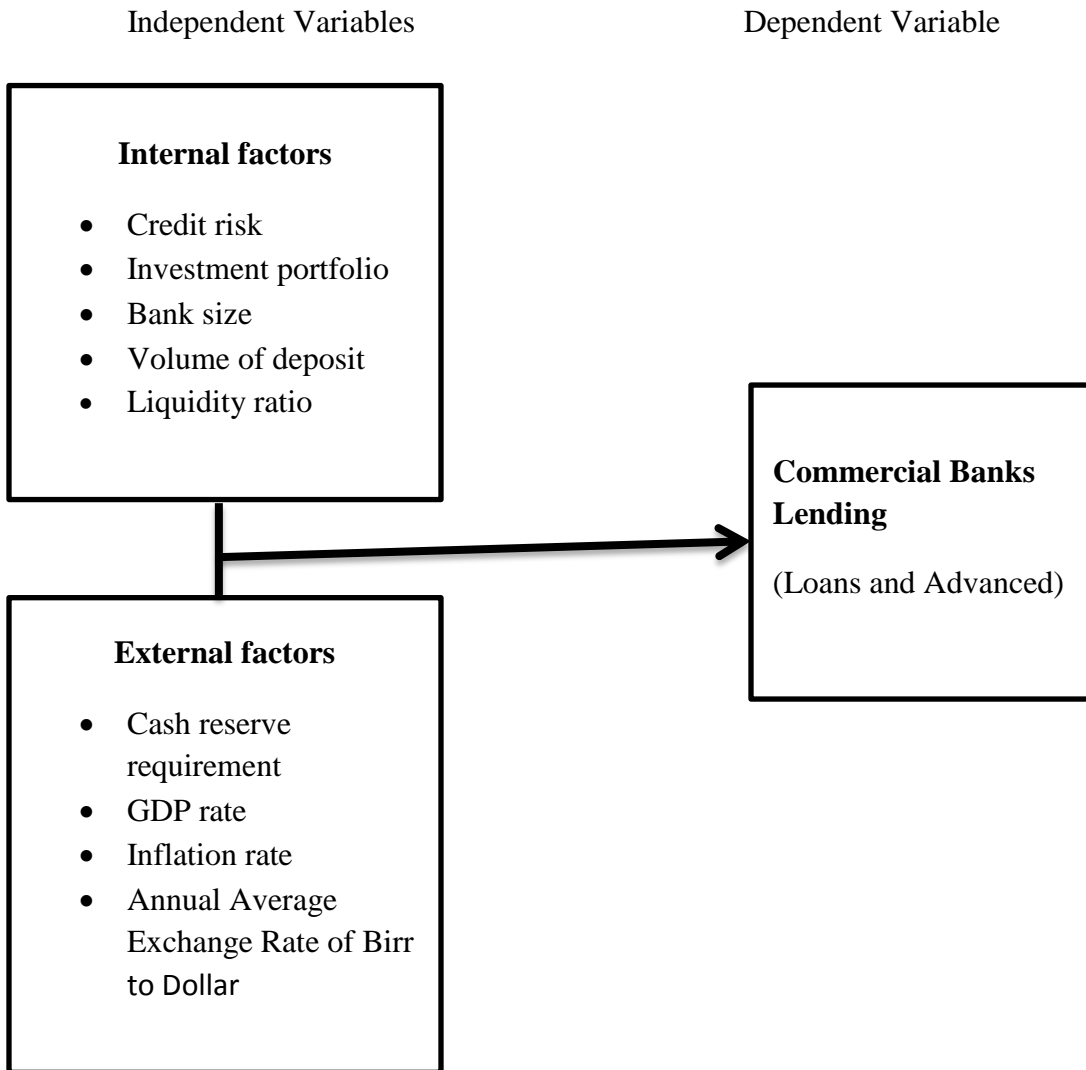
2.4. Summary of literature review and knowledge Gap

From the studies reviewed, the banking system came under severe stress, which necessitated central bank action to support both the functioning of money markets and, in a few cases, individual institutions. Lending represents the heart of the banking industry. Therefore, its administration requires considerable skill and dexterity on the part of the bank management.

In view of the above theoretical and empirical review, numerous studies have been conducted on the determinants of commercial banks lending behavior. Most of these studies focused on the developed countries banking sector. Although such types of research were done in developing countries limited literatures were available for this research including our country Ethiopia. Besides, most of the empirical studies reviewed and discussed in the above sections were conducted in other countries; and studies in Ethiopia commercial banking sector are very scanty. As per the researcher knowledge, the only empirical studies on this area are the research under

taken by Mitku (2014), Amano (2014) and Berhanu(2016). Further from the studies the determinants of commercial banks lending behavior is inconclusive with some researcher finding insignificant effect while others establishing significant influence. This study bridges this gap by using additional bank specific and macroeconomic variables on private commercial banks lending behavior in Ethiopian to achieve research objectives.

Figure 2.1: Conceptual framework



CHAPTER THREE

RESERCH METHODOLOGY

3.1. Introduction

This chapter was focused on research design and methodology that were used to undertake the research. These were; research approach, sample design, sample size and sampling techniques, data source and collection methods, procedure of data collection, ethical consideration and summary.

3.2. Research design and approach

To achieve the objectives of the study, this study was based on explanatory research design. As explained by Bhattacharjee (2012), explanatory research attempts to identify causal factors and outcomes of the target phenomenon.

The quantitative data research relies on the measurement and analysis of statistical data to produce quantifiable conclusions. Quantitative research is a means for testing objective theories by examining the relationship among variables (Creswell, 2009). Therefore, for this study quantitative research method approach was employed to see the relationship between the ‘‘Loans & Advances’’ of private commercial banks and the bank specific and macroeconomic factors affecting banks lending decision in Ethiopia by establishing causal relationship with the purpose of explaining, predicting and controlling phenomenon. Thus, the study utilized nine years data from 2009 to 2017 periods. This design provided as much information on the entire population under study in relation to examine the determinants of commercial banks lending decision in Ethiopian context.

3.3. Sample Design

The sampling design was deals with the method of selecting items from a targeted population to be engaged for the given study. Sample design comprises the following procedures such as, population or universe, sample technique and sample size (Kothari, 2004).

Population or Universe

Population is the list of elements which the sample may be drawn (John, 2007). The target populations of this study are all private commercial banks in Ethiopia. According to NBE report, currently there are sixteen private commercial banks in Ethiopia (NBE, 2017). These includes: Awash Bank S.C (AB), Bank of Abyssinia S.C (BOA), Wegagen Bank S.C (WB), United Bank S.C (UB), Nib Bank S.C (NB), Dashen Bank S.C (DB), Cooperative Bank of Oromia S.C (CoBO), Lion Bank S.C (LB), Oromia International Bank S.C (OIB), Zemen Bank S.C (ZB), Buna Bank S.C (BUB), Berehan Bank S.C (BB), Abay Bank S.C (AB), Addis Bank S.C (AdB), Debub Global Bank S.C (DGB) and Enat Bank S.C (EB)

3.4. Sampling techniques and Sampling Size

Sampling is a technique of selecting a suitable sample for the purpose of determining parameters of the whole population. Accordingly, the study employed non-probabilistic or purposive sampling technique to select the required sample. As stated by Saunders et al (2009), purposive sampling is often used when working with small samples and when we wish to select cases that are particularly informative. In order to obtain representative data, non-probabilistic or purposive sampling technique was employed in this study. The target population of the study was all 16(100%) private commercial banks in Ethiopia. From those private commercial banks 10(62.5%) private commercial banks that have at least nine years data i.e., 2009 to 2017 was selected by using purposive sampling technique by considering the availability of full data for the selected time period on their total outstanding loans and advances because difficult to include 100% sample or the whole population. Besides, selecting nine years sample period was help the researchers to increase the number of observation, and to have sufficient and reliable data. Therefore, ten private commercial banks were selected. These banks are; Awash Bank S.C, Bank of Abyssinia S.C, Wegagen Bank S.C, United Bank S.C, Nib Bank S.C, Dashen Bank S.C, Cooperative Bank of Oromia S.C, Lion Bank S.C, Oromia International Bank S.C, and Zemen Bank S.C and it is possible to draw a relationship among variables using 90 observations (10 banks x 9 year's data).

3.5. Nature of data, source of data and data collection techniques

Data collection is the process of gathering, assembling and accumulation of information; there are two methods of data collection, that is, the primary data and secondary data. In order to carry

out any research activity information should be gathered from proper sources. Consistent and reliable research indicates that research conducted by using appropriate data collection instruments increase the credibility and value of research findings (Koul, L 2006). For the purpose of this study, secondary data source was used to achieve the objective of the research. A secondary data was used in the study since it is less expensive in terms of time and money while collecting and also of its high quality data (Saunders et al (2007). Secondary data may either be published or unpublished data (Kothari, 2004). The data included both bank specific data and macroeconomic data. Bank specific data was obtained from the audited annual financial statements of each selected commercial banks included in the sample and macroeconomic data was collected from National Bank of Ethiopia (NBE) and Ministry of Finance and Economic Cooperation (MoFEC).

This study was used panel data approach because it controls the time and individual variation in the observable behavior or cross sectional time series aggregated; the observed or unobserved individual heterogeneity; and the hierarchical structure. The panel data was covered a period of nine years from 2009 to 2017.

3.6. Study Variables and research hypotheses

3.6.1. Dependent Variable

❖ Loans and Advances

“Loans and Advances” are the dependent variable used in this study and it measures the total loans outstanding as a percentage of total assets or the percentage of the assets that is attached to loans. It is the total annual gross loans and advances the private commercial banks advances to both the public and private sector. A loan is the act of giving money, property or other material goods to another party in exchange for future repayment of the principal amount along with interest or other finance charges. Thus, from the view point of borrower, it is “borrowing” and from the view point of bank, it is “lending”. Loan may be regarded as “credit” granted where the money is disbursed and its recovery is made on a later date. It is a debt for 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 of by the borrower. 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.

When the total loans outstanding as a percentage of total assets ratio is high, it implies that a bank is loaned up or they have less excess reserve and its liquidity is low. The higher the ratio, the riskier a bank may be to higher defaults or is likely to experience bad debts from its borrowers and the less liquid it is. The proxy used to determine this ratio is log of total loans and advances of the bank.

3.6.2. Independent Variables

Determinants of lending are factors which influence the lending decision of commercial banks. The supply of bank loans is usually expressed as a function of both internal and external determinants. The internal determinants are termed micro- or bank-specific determinants of bank lending, while the external determinants are variables that are not related to bank management but reflect the monetary, economic and legal environment that affect the operations and performance of financial institutions. But the effect and the number of these factors differ from country to country as well as from studies to studies due to different reasons. Some have positive impact and some negative impact on the banks lending behavior. The number of explanatory variables that have been proposed for both categories depends on the nature and purpose of each study (Athanasoglou et al., 2008). Accordingly, the common determinates of lending behavior that are used in this study are Credit risk, Investment portfolio, Bank size, Volume of deposit, Liquidity ratio, Cash reserve requirement, Gross Domestic Product, Inflation rate, and Annual Average Exchange Rate of the Birr to Dollar. These are discussed in detail hereunder.

3.6.2.1. Banks' internal (bank-specific) determinants of lending decision

❖ Credit risk ratio

Credit risk is defined as the risk of loan repayment default by borrowers. Credit risk arises from poor lending discipline, quite often-inadequate attention to credit analysis, poor follow up and management of loans and too much reliance on collateral. As a result, asset prices decline and credit risk emerges. Loan default is a common feature of credit risk. It is the likelihood that a debtor to the bank will not meet obligation in accordance with agreed terms. Good loans are the

most profitable assets for banks and are the base for their existence. Conversely, bad loans pose threats to the financial and institutional sustainability of banks. Credit risk is, therefore, understood as the critical problem in the banking industry that needs to receive management's priority attention and proper administration.

Credit risk is also variously referred to as default risk, performance risk or counterparty risk (Brown and Moles, 2012). According to Chen and Pan (2012), credit risk is the degree of value fluctuations in debt instruments and derivatives due to changes in the underlying credit quality of borrowers and counterparties. Credit risk is by far the most significant risk faced by Banks and the success of their business depends on accurate measurement and efficient management of this risk to a greater extent than any other risk (Giesecke, 2004).

Credit risk is critical since the default of a small number of important customers can generate large losses which can lead to insolvency (Bessis, 2002). Variation in credit risk may reflect a change in the health of a bank's loan portfolio (Cooper et al., 2003), which in turn may influence the performance of the institution. Loan is the main income generating activity for the Banks. But this activity involves huge risks to both the lender and the borrower. The risk of a trading partner not fulfilling his or her obligation as per the contract on due date or anytime thereafter can greatly jeopardize the smooth functioning of Bank's business. In a bid to survive and maintain adequate profit level in this highly competitive environment, Banks have tended to take excessive risks. However, it exposes the banks to credit risk. The higher the Bank exposure to credit risk, the higher the tendency of the Banks to experience financial crisis and vice-versa. More financial institutions are exposed to high risk loans and the higher accumulation of unpaid loans. Implying that, these loan losses have produced lower returns to many commercial banks (Miller and Noulas, 1997). Chodechai (2004) further stressed that, banks' lending decisions influenced by the past relationship with the borrowers, which enables to have more accurate understanding of the borrower's business and financial situation. Therefore, the issue of credit risk in banking operations also affects the lending behavior of commercial banks and one of an important variable in determining loans and advances from the supply side (Mitiku, 2014).

The measurement of credit risk ratio that was used in this study is the (Loan loss reserve/Gross loans) which is a reserve for loan losses indicated as a percentage of total loans. A negative

relationship is expected between credit risk ratio and banks' lending because the more borrowers fail to repay their debt obligations, the more banks are unwilling to lend or give out loans.

H1: Credit risk ratio has negative impact on banks "loan and advance"

❖ **Investment portfolio**

Development of a country has no root without investment and investment without return bears no fruit. Investment is time, energy, or matter spent in the hope of future benefits actualized within a specified date or time frame. Investment has different meanings in economics and finance. In economics, investment is the accumulation of newly produced physical entities, such as factories, machinery, houses, and goods inventories. In finance, investment is putting money into an asset with the expectation of capital appreciation, dividends, and/or interest earnings. This may or may not be backed by research and analysis. Most or all forms of investment involve some form of risk, such as investment in equities, property, and even fixed interest securities which are subject, among other things, to inflation risk. It is indispensable for project investors to identify and manage the risks related to the investment.

Commercial banks are the most important savings mobilization and financial resource allocation institutions. Consequently, these roles make them important institutions in economic growth and development. In performing these roles, it may be realized that banks have the potentials, scope and prospects for mobilizing financial resources and allocating them to productive investment. Mitiku (2014) and Ibrahim Mansor (2006) findings, as it is clear in the results, it is obvious that the investment is linked statistically insignificant with lending to commercial banks. There finding explains that when the bank invests its resources in various financial instruments of interest to the bank, its lending capacity also increases.

Suresh (2012) opined, due to reforms and developments in the capital market, particularly the developments of non – banking financial companies, there is much more awareness among the investors, and deposit mobilization has become competitive and challenging for the banking industry. According to him, the present investors are ready to face the situation by investing their money in the high-risk and high returns investment, which also facilitates other avenues like tax exemptions and concessions. This confirms that banks generate their incomes through the lending and investment activities.

The measurement of investment portfolio ratio that was used in this study is the ratio of bank's total investment in security to total asset. A positive relationship is expected between investment portfolio ratio and banks' lending because the more banks invest on securities, the more banks are unwilling to lend or give out loans.

H2: Investment portfolio has positive impact on banks "loan and advance"

❖ **Bank size**

The Bank size is generally introduced to account for existing economies of scale in the Banking market. It refers to the total assets of the bank. It measures the base for the total resources available to the bank for lending. It is considered an important determinant of bank-lending decisions in the existing literature (Berger and Udell, 2006; Uchida et al., 2008). Berger and Udell (2006) find that large, complex banks tend to lend few loans to small-scale firms. On the other hand, when large and complex banks are able, through technical expertise, to process soft information about small scale firms, then there would be positive relationship between bank size and lending.

Stein (2002) explains that small banks have comparative advantages in producing soft information. Thus, a negative relationship is expected between bank size and lending-growth. However, when large, complex banks are able to process soft information about small-scale firms through technical expertise and scale economies (Boyd and Runkhle, 1992), there is a positive relationship between bank size and lending-growth. 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. Chernykh and Theodossiou (2011) indicated that the large banks are usually more diversified and they have large funds and more accessibility to borrowers from large companies with a high credit card balances, in addition they possess adequate resources for the development of advanced systems to manage and assess the credit risk. To proxy bank size natural logarithm of total assets of the bank was used. A positive relationship is expected between bank size and banks' lending because large size and complex banks are able to lend or give out loans than small size bank.

H3: Bank size has positive impact on banks "loans and advances"

❖ **Volume of deposit**

It is understandable that, the main source of lending is deposit or money accepted from the depositor but the amount that would have to be lent is a certain percentage of the total deposited amount and the remaining is kept as a reserve for the purpose of maintaining its liquidity. 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. 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). Deposits include saving deposit, demand deposit and term(time) deposits. Total deposits show the share of deposits compared to total assets. As total deposit increase the total advance and loan increases proportionally (Ajay 2007).). Accordingly increase in deposit of a bank will improve its ability to lend more funds to its customers. According to Mc Carthy et al. (2010) Customers' deposit is the primary source of bank loan. Olokoyo (2011) asserts that commercial banks deposits have the greatest impacts on their lending behaviour. Moreover, Sebastian (2009) strongly reveal that, demand deposit liabilities had the most significant and positive influence on banks' credit allocations in Nigeria case. Deposit has positive and statistically insignificant relationship with commercial bank lending(Mitku, 2014).Therefore the larger the volume of bank deposits, the more loanable funds available to the banks, hence the higher likelihood of given out more loans and advances. The measurement of volume of bank deposits ratio that was used in this study is the ratio of total customer deposit to capital (total asset). Accordingly, positive relationship is thus expected between volume of deposits and bank lending decision.

H4: Volume of deposit has positive impact on banks "loans and advances"

❖ **Liquidity ratio**

Liquidity Ratio refers to reserve requirement, a bank regulation that sets the minimum reserves each bank must hold. Liquidity ratio expresses a company's ability to repay short-term creditors out of its total cash. It is the result of dividing the total cash by short-term borrowings. It shows the number of times short-term liabilities are covered by cash. If the value is greater than 1.00, it means fully covered. Since loans are illiquid assets, increase in the amount of loans means increase in illiquid assets in the asset portfolio of a bank. Banks are normally faced with liquidity

risk when they are unable to convert a security or an illiquid asset to cash without a substantial loss of income or capital. 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. Commercial banks, therefore, have to stock reasonable quantity of cash to meet their customers' demands. Hence, a commercial bank cannot afford to grant loans and advances in excess of its cashing ability. According to (Mitku, 2014) liquidity ratio had positive and statistically significant relation with commercial bank lending. Similarly, their liquidity ratio was above the minimum requirement of 15% - fairly liquid. Banks are thus quite healthy, well capitalized and profitable (Birritu, 2015) there have occurred sporadic liquidity shortages, and the aggregate liquidity ratio is now close to the statutory minimum of 15 percent. While the rapid pace of financial deepening is welcome, strengthening the supervisory and regulatory environment is necessary to ensure that lending standards do not deteriorate (IMF CR, 2016). Ituwe (1985) posited that on one side, banks transform customers deposit to loans and advances which is illiquid and on the other side, obliged to pay to the demands by customers in terms of withdrawals from their deposits which have to be met instantaneously. Rababah (2015) in his study, liquidity ratio has a negative impact on credit facilities. The size of the liquid assets held by the bank is one of the factors affecting the size of bank lending because the high liquidity ratio reduces the proportion of loans granted (Rababah (2015)). More liquid banks are able to provide more lending by drawing on their stock of liquid assets (Beji, Belhadj (2014)). Moreover, the issue of liquidity in banking operations also affects the lending behavior of commercial banks. Similarly, according to Rababah (2015) the size of the liquid assets held by the bank is one of the factors affecting the size of bank lending because the high liquidity ratio reduces the proportion of loans granted; therefore a negative relationship is thus expected between liquidity ratio and bank lending decision. The measurement of liquidity ratio that was used in this study is the ratio of current asset to current liabilities.

H5: Liquidity ratio has negative impact on banks "loan and advance"

3.6.2.2. Banks' external (macroeconomic) determinants of lending

❖ Cash reserve requirement

Reserve requirements are requirements regarding the amount of cash a bank must hold in reserve against deposits made by customers. This money must be in the bank's vaults or at the closest Federal Reserve Bank. Set by the Fed's board of governors, reserve requirements are one of the three main tools of monetary policy — the other two tools are open market operations and the discount rate.

The liquidity of banks could be controlled by the minimum reserve requirements given by each respective countries central bank in order to protect the bank against liquidity rush from its depositors in certain economic conditions. Therefore, proponents of reserve requirements often blended the two or spoke of the benefits both in terms of the safety of the banks and the promptness with which banks could meet withdrawals, though there was perhaps a bit more frequent mention of the liquidity benefits.

Banks loan funds out to customers based on a fraction of the cash they actually have on hand. The government makes one requirement of them in exchange for this ability: keep a certain amount of deposits on hand to cover possible withdrawals. This amount is called the reserve requirement, and it is the rate that banks must keep in the reserve. The Federal Reserve's Board of Governors sets the requirement as well as the interest rate banks get paid on excess reserves. The reserve requirement ratio also plays an important role in a banks capacity to give out loans and credit. Christian and Pascal (2012), Cargill and Mayer (2006), Montono and Moreno (2011) contended that an increase in reserve requirement case to decrease bank credit. Montoro and Moreno (2011) shows this by stating that, central bank raise reserve requirements to contain credit growth in the boom part of the business cycle in order to counteract financial imbalances in the economy or in an economic downturn, they can lower reserve requirements to utilize reserve buffers accumulated during the boom part, having the banking sector extend more credit to non-financial businesses.

Further, Wilcox (2012) sustains that changes in reserve requirements had only small and statistically insignificantly impacts on bank loans and investments. On the other hand, Sapeinza (2004) demonstrated that state and privately owned banks behave differently. However, some researchers claim that, a raise in Commercial Bank cash required reserves sources to increase its credit creation ability. The assumption here is that the higher the reserve requirements from the central bank, the lower the amount of credits and loans a bank is willing to give to the public.

The measurement of cash required reserves ratio that was used in this study is the ratio of Cash required reserves to total asset

H6: Cash reserve requirement has negative impact on banks “loan and advance”

❖ **Gross Domestic Product**

The OECD defines GDP as "an aggregate measure of production equal to the sum of the gross values added of all resident and institutional units engaged in production (plus any taxes, and minus any subsidies, on products not included in the value of their outputs)." An IMF publication states that "GDP measures the monetary value of final goods and services - that is, those that are bought by the final user - produced in a country in a given period of time (say a quarter or a year).

Gross domestic product is the best way to measure a country's economy. GDP is the total value of everything produced by all the people and companies in the country. It doesn't matter if they are citizens or foreign-owned companies. If they are located within the country's boundaries, the government counts their production as GDP. GDP show the growth of economic activity in the country (Ayadi and Boujelbène (2012)). Hing (1986) by investigating the monetary transmission through bank loans and establishes that change in GDP cause to change the volume of loans. Pruteanu – Podpiera (2007) investigated the impact of gross domestic product growth on growth rate of total loans in Czech banks from (1996...2001). The results suggest a strong positive effect of GDP growth on the growth rate of loans. Dell Arricia and Marquez (2006) find that bank credit expansion tent to be procyclical that is; high return of growth in GDP tends to induce a high rate of growth in bank credit. 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 its up and downswings influence the demand for borrowing. The study of the effect of GDP on demand for credit was carried by the assumption that better economic conditions increase the consumer and investor optimism. With higher expectations on 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 assumption here is that the higher the change of real GDP annually from macroeconomic environment, the higher the amount of credits and loans a bank is willing to give to the borrowers. The components of GDP

are: Personal Consumption Expenditures plus Business Investment plus Government Spending plus (Exports minus Imports). But the measurement of GDP ratio that was used in this study is the Percentage of the rate of change of real GDP annually.

H7: Gross Domestic Product (GDP) growth has positive impact on banks “loan and advance”

❖ **Inflation rate**

In economics, inflation is a sustained increase in the general price level of goods and services in an economy over a period of time. When the price level rises, each unit of currency buys fewer goods and services; consequently, inflation reflects a reduction in the purchasing power per unit of money – a loss of real value in the medium of exchange and unit of account within the economy. Conceptually, inflation refers to the general trend of prices, not changes in any specific price. Inflation is related to the value of currency itself. When currency was linked with gold, if new gold deposits were found, the price of gold and the value of currency would fall, and consequently prices of all other goods would become higher.

Inflation affects economies in various positive and negative ways. The negative effects of inflation include an increase in the opportunity cost of holding money, uncertainty over future inflation which may discourage investment and savings, and if inflation were rapid enough, shortages of goods as consumers begin hoarding out of concern that prices will increase in the future. Positive effects include reducing the real burden of public and private debt, keeping nominal interest rates above zero so that central banks can adjust interest rates to stabilize the economy, and reducing unemployment due to nominal wage rigidity.

Today, most economists favor a low and steady rate of inflation. Low (as opposed to zero or negative) inflation reduces the severity of economic recessions by enabling the labor market to adjust more quickly in a downturn, and reduces the risk that a liquidity trap prevents monetary policy from stabilizing the economy. The task of keeping the rate of inflation low and stable is usually given to monetary authorities. Generally, these monetary authorities are the central banks that control monetary policy through the setting of interest rates, through open market operations, and through the setting of banking reserve requirements.

The study of Naceur (2009) offers the following explanation: the main activity of banks (mostly commercial) is lending and the market is therefore based on an offer of credit (provided by

banks) and demand (the individuals and companies). Inflation reduces the demand for credit because it increases uncertainty about the future. Taner (2000) study on the effect of inflation uncertainty on credit market reveals that unpredictable inflation raises interest rate, decrease loan supply affect loan demand. This therefore suggests that an increase in inflation may raise the bank lending rates and lead to low bank lending volume. Emon (2012) confirm this assertion and states that lenders are very aware that inflation erodes the value of their money over the time period of loan, so they increase the interest rate to compensate for the loss.

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 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. To proxy inflation the annual gross inflation rate was used in this study.

H8: Inflation rate has negative impact on banks “loan and advance”

❖ **Annual Average Exchange Rate of the Birr to Dollar.**

Exchange rate is considered as a price upon which economic agents rely in making economic decisions about resource allocation. But the question under exchange control and/or managed floating economy is to know which rate (official or parallel) fully reflects the available information for appropriate decision making by economic agents. In short, the National Bank of Ethiopia controls the supply of and demand for money largely by using the mix of both direct and indirect monetary policy instruments. These include setting a floor rate for saving and time deposits, credit ceilings on government borrowings from the banking system, reserve requirements and open market operations mainly sale of Treasury Bills.

However, exchange rates are by definition the relative prices of currencies and are endogenous variables in which their value gets determined within a general equilibrium context, alongside other asset prices. Blundell and Bond (1998) find evidence of negative and significant impact of some macroeconomic indicators (exchange rate) on bank lending behavior. Olumuyiw and al. (2012) takes a look at determinants of lending behavior of commercial banks in Nigeria: the

study result reveals that there is positive relationship between Loan and advances annual average exchange rate of the naira to dollar. That is as Commercial bank Loan and advances increases, annual average exchange of naira to dollars also increases and vice versa. And also this study expects to have a positive effect on the total loans and advanced by commercial banks. To proxy Exchange rate annual average exchange rate of the birr to US dollar was used.

H9: Exchange rate has positive impact on banks “loan and advance”

3.7. Data analysis and Interpretation

After the data was collected, it was organized and financial ratios were computed for each selected bank of each bank specific variables and also the same way for macroeconomic variables. And then, it was analyzed and interpreted to achieve the stated objectives. Descriptive statistics was used to analyze the general trends of the data from 2009 to 2017 based on the sample of ten private commercial banks. Then, correlation analyses between dependent and independent variables were made. Finally, the study employed an econometric data analysis technique of balanced panel random/fixed effect regression model approach including all of its assumptions was employed. Data was collected from different sources and was analyzed by using E-views version 9.

3.8. Specification of the Model

This study adopted the model employed by Olokoyo (2011), Mitku.M (2014), Amano (2014) and Berhanu(201) whereby all commercial banks are considered for the defined period of time (9 years). The model captures how different bank specific variables as well as macroeconomic variables feed into the overall bank lending decision. The model used in this study is summarized in a sample of ten Ethiopian private Commercial banks and the analysis of these banks was done considering the loan and advances as the dependent variable, while the bank-specific and macroeconomic variables were considered as the independent variables that have been identified through literature and theory i.e. credit risk, annual average exchange rate of the birr to dollar, investment portfolio, inflation rate, bank size, volume of deposit, liquidity ratio, cash reserve requirement, and gross domestic product. There are other factors not explicitly included in the model that are policy instruments for regulation of banks operation like government control and monetary authorities guidelines and past relationship with customers. These are captured by the

error term in the model. Both the random and fixed effect model were carried out and the probability value (P-value) of hausman test was greater than alpha (α) at all levels 1%, 5%, and 10%, the study failed to reject the random effect is appropriate. Therefore, the fixed effect model is not appropriate and we use the random effect model to run our balanced panel data for the regression analysis. The model adopted assumes an underlying relationship between the variables expressed in a functional form and banks' loans and advances.

The nature of data that was used in this study enabled to use panel/longitudinal data model which is deemed to have advantages over cross sectional and time series data methodology. Panel data involves the pooling of observations on the cross-sectional over several time periods. As Brook (2008) stated the advantages of using 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. Thus, the general panel/longitudinal regression model was as follows:

$$Y_{it} = \alpha_i + \beta X_{it} + u_{it}$$

With subscript i denote the cross-section and t representing the time-series dimension. The left-hand variable Y_{it} is the dependent variable, α is the intercept term, β is a $k \times 1$ vector of parameters to be estimated on the explanatory variables, and X_{it} is a $1 \times k$ vector of observations on the explanatory variables, $t = 1, \dots, T$; $i = 1, \dots, N$.

The model is specified implicitly below:

$$LOA = f(Cri, Ip, Bsiz, Vd, Lr, Crr, Gdp, Infr, Fx, Z) \dots\dots\dots (1)$$

Where Z contains other variables not explicitly included in the model.

The explicit form of equation (1) above is represented as follows:

$$LOA_{i,t} = \beta_0 + \beta_1(Cri,t) + \beta_2(Ipi,t) + \beta_3(Bsizi,t) + \beta_4(Vdi,t) + \beta_5(Lri,t) + \beta_6(Crri,t) + \beta_7(Gdpi,t) + \beta_8(Infri,t) + \beta_9(Exi,t) + u_{i,t} \dots\dots\dots (2)$$

Where;

LOA: Loans and Advances

Cr: Credit ratio

Ip: Investment portfolio

Bsiz: Bank size

Vd: Volume of Deposits

Lr: Liquidity Ratio

Crr: Cash Reserve Requirement Ratio

Gdp: annual real GDP growth

Infr: annual inflation rate

Ex: Annual Average Exchange Rate of the Birr to Dollar

β_0 : intercept term for each bank i and β_1 - β_{10} are the coefficients of the explanatory variables at time t

$\mu_{i,t}$: The error term

Betas (β) are the parameters of the models. In addition, with subscript i denote the cross-section we note that $i = 1, 2, 3, \dots, 10$ since we are analysing 10 private commercial banks while t representing the time-series dimension, $t = 1, 2, 3, \dots, 9$ since our analysis capture nine years from 2009 to 2017.

Table 3.1: Description of the variables used in the regression model

	Variables	Symbols	Description	Expected Sign
Dependent	loan and advances	LOA	Log of total loans and advances of the bank	NA
Independent	Credit risk ratio	Cr	The ratio of (Loan loss reserve) to Gross loans	Negative
	Investment portfolio	Ip	The ratio of bank's total investment in security to total asset	Positive

	Bank size	Bsiz	Log of total assets of the bank	Positive
	Volume of Deposits	Vd	The ratio of total customer deposit to capital(Total Asset)	Positive
	Liquidity Ratio	Lr	The ratio of Current Asset to Current Liabilities	Negative
	Cash Reserve Requirement Ratio	Crr	The ratio of Cash required reserves to total asset	Negative
	Annual real GDP growth	Gdp	Percentage of the rate of change of GDP annually	Positive
	Annual inflation rate	Infr	Annual inflation growth rate	Negative
	Exchange Rate of the Birr to US Dollar	Ex	Annual Average Exchange Rate of the Birr to US Dollar	Positive

CHAPTER FOUR

RESULTS AND DISCUSSIONS

In this chapter the data collected was presented and an important correlation and regression analysis finding was discussed.

4.1. Descriptive statistics

The statistical description of the table below shows the mean, median, maximum, minimum, standard deviation, Skewness, Kurtosis value and number of observations for the dependent variable Total Loans & Advances (LOA) and independent variables: (CR) Credit ratio, (IP) Investment portfolio, (BSIZ) Bank Size, (VD) Volume of Deposits, (LR) Liquidity Ratio, (CRR) Cash Reserve Requirement Ratio, (GDP) annual real GDP growth, (INFR) annual inflation rate, and (EX) Annual Average Exchange Rate of the Birr to US Dollar. Mean is a measure of central tendency used to describe the most typical value in a set of values. Standard deviation shows how far the distribution is from the mean; or the dispersion of the variables from their average. A small standard deviation implies that most of the sample means will be near the center population means thus the sample mean has a good chance of being close to the population mean and a good estimator of the population mean. On the other hand, a large standard deviation illustrates that the given sample mean will be a poor estimator of the population mean. Skewness and kurtosis were also taken into account. Skewness is a measure of symmetry, or more precisely, the lack of symmetry. A distribution, or data set, is symmetric if it looks the same to the left and right of the center point. Kurtosis is a measure of whether the data are peaked or flat relative to a normal distribution.

Table 4.1: Descriptive statistics of study variables over the period of 2009-2017

	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Observations
LOA	9.515301	9.599723	10.35365	8.053078	0.451296	-0.836596	3.574107	90
CR	0.025139	0.02073	0.157211	0	0.024587	2.499477	12.11167	90
IP	0.15167	0.180106	0.307753	0	0.094419	-0.483711	1.958119	90
BSIZ	9.866073	9.932686	10.62299	8.506505	0.419013	-0.915035	3.752419	90
VD	0.760488	0.770046	0.844294	0.573209	0.051877	-1.028431	4.416123	90
LR	0.443455	0.406518	0.940217	0.166143	0.193236	0.511493	2.223567	90

CRR	0.126271	0.100129	0.369793	0.035736	0.081364	0.98473	3.227475	90
GDP	0.252801	0.223761	0.451589	0.121023	0.107453	0.613757	1.98019	90
INFR	0.123873	0.084641	0.380441	0.027069	0.102195	1.703823	4.681468	90
EX	0.091716	0.058348	0.200207	0.046139	0.059266	1.041169	2.334637	90

Source: Financial statement of sampled banks, MoFEC reports and own computation through E-views 9(2018)

The statistical description of the table above shows the loan and advance of private commercial banks in Ethiopia ranges from 8.05 to 10.35 with the mean value of 9.52 and standard deviation was 0.4513% shows lower dispersion from its mean value. The result of the study shows that most private commercial banks in Ethiopia have the same level of lending capacity.

Mean value of credit risk ratio was 2.514% which denotes that it, averagely private commercial banks in Ethiopia under the study period has 2.514% credit risk level. Its maximum value 15.721% and minimum value 0.00% shows that there was more or less a higher credit risk exposure over the sample period for this study (i.e. from 2009-2017) 15.721% was observed in same private commercial banks in Ethiopia and there was no credit risk exposure in others that was 0.00%.

Furthermore on average the investment portfolio in all the nine years under study was 15.167% meaning that PCBs advanced their asset this amount of money investment on different securities for the period under study on average. The maximum and minimum values were 30.775 and 0.00% respectively. This result shows some financially strong PCBs invest 30.775% of their total asset on different securities and others was no investment portfolio at all over the study period. The standard deviation of the IP was 9.442% shows lower dispersion from its mean value; which denotes that Ethiopian private banks are very minimally participates in treasury bills market that explains the low value of the result.

Bank size(BSIZ), measured using Log of total assets of the bank ranges from a minimum values of 8.50651 to a maximum of 10.623 with a mean value 9.86607 and standard deviation of 0.41901 shows lower dispersion from its mean value implies the existence of similarity of bank size between PCBs in Ethiopia.

On assessing the volume of deposit, the study found out that over time, the mean value was 76.049% and the minimum volume of deposit reported was 57.321% and the highest reported was 84.429%. This huge range implies that the variables exhibit variability given the variance in the specified basic descriptive statistics. The standard deviation for volume of deposit was 5.188% revealing high dispersion towards the mean among banks in Ethiopia.

Further, the liquidity ratio is on average, 44.346% the maximum and minimum values were 94.022% and 16.614% respectively. The liquidity measure indicates that the Ethiopian private commercial banks have, on average, a higher liquidity position. The standard deviations of 19.324% show little dispersion of liquid assets to total assets ratio from its mean for the private commercial banks in Ethiopia.

The (CRR) cash reserve requirement ratio, of the banks used in this study had a mean of 12.627% with the maximum and minimum value of 36.979% and 3.574% respectively; and the standard deviations was 8.136% shows the existence of variation of cash reserve to asset ratio between the private commercial banks in Ethiopia.

(GDP) annual real gdp growth and (INFR) Annual inflation rate was the two macroeconomic variables employed in this study had a related standard deviation of 10.7453% and 10.2195% respectively when compared to the standard deviation of all study variables. It shows lower dispersion from its mean value implies the economic growth and inflation rate in Ethiopia during the study period remains stable when compared to others study variables. Their mean was 25.2801% and 12.3873% and with the maximum and minimum value of (45.1589% & 38.0441%) and (12.1023% & 2.7069%) respectively.

The last bank macroeconomic variable, i.e. (EX) annual average exchange rate of the birr to US dollar, its mean value was 9.172% across all the years under study with the maximum and minimum value of 20.02% and 4.614% respectively and the standard deviation of 5.927%, it was closer to the mean which shows that almost few variations were observed in the annual average exchange rate of the birr to US dollar.

4.2. Correlation analysis

Correlation analysis is used to determine the extent of the correlation of different pairs of variables under study. According to Brooks (2008), correlation between two variables measures

the degree of linear association between them. To find the association of the independent variables with dependent variables Pearson Product Moment of Correlation Coefficient was used in this study. It measures/calculates the correlation coefficient between 1 and -1. This further predicts presence or absence of multicollinearity which is considered to exist when there is perfect linear relationship between the variables under the study; +1 (i.e. perfect positive relationship) to -1 (i.e. perfect negative relationship) and a correlation coefficient of zero, indicates that there is no linear relationship between the two variables. The correlation matrix was used to determine if any pair of independent variables was highly collinear through the magnitude of the correlation coefficient of the pairs of variables established. This bias arises when one or more pairs of independent variables are perfectly correlated to each other. Most pairs were found to be highly correlated leading multicollinearity. The sample size is the factor to determine whether or not the correlation coefficient is different from zero i.e statistically significant. As a sample 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 10*9 matrixes of 90 observations which was around 100 hence the study used the above justification for significance of the correlation coefficient.

Table 4.2: Correlation Matrix of Dependent and Independent Variables

Prob	LOA	CR	IP	BSIZ	VD	LR	CRR	GDP	INFR	EX
LOA	1.0000									
CR	-0.1846	1.0000								
IP	0.5325	-0.3685	1.0000							
BSIZ	0.9944	-0.1798	0.5329	1.0000						
VD	0.4553	0.0236	0.2278	0.4554	1.0000					
LR	-0.7584	0.3852	-0.8016	-0.7283	-0.4494	1.0000				
CRR	-0.4844	0.45	-0.7304	-0.4670	-0.0501	0.7636	1.0000			
GDP	-0.2899	0.0695	-0.1822	-0.2828	-0.1176	0.2805	0.3208	1.0000		
INFR	-0.1223	0.0043	0.0256	-0.0791	0.0586	0.1718	0.1967	0.5452	1.0000	
EX	-0.4822	0.3087	-0.6588	-0.4564	-0.1007	0.7227	0.7464	0.1367	0.4909	1.0000

Source: Own estimation of research data through E-views 9 (2018)

According to Brooks (2008), if it is stated that y and x are correlated, it means that y and x are being treated in a completely symmetrical way. Thus, it is not implied that changes in x cause changes in y, or indeed that changes in y cause changes in x rather, it is simply stated that there is

evidence for a linear relationship between the two variables, and that movements in the two are on average related to an extent given by the correlation coefficient.

Among the bank specific variables investment portfolio, bank size and volume of deposits are positively correlated with total loans & advances with correlation coefficient of 0.5325, 0.9944 and 0.4553 respectively. While credit risk ratio and liquidity ratio are negatively correlated with total loans & advances with correlation coefficient of -0.1846 and -0.7584 respectively. Investment portfolio had statistically significant and positive linear relationship with total loans and advances. This result was in-line to the expectation of the study which states that total loans and advances and investment portfolio had positive relationship. Similarly, volume of deposits had statistically significant and positive linear relationship with total loans and advances. This result was in line with the study hypothesis. Increase in the volume of deposit of the bank shows a higher positive correlation volume of deposit to total asset ratio (0.4553). The negative relationship of credit risk ratio with loan and advance was in line with the study hypothesis and statistically insignificant/ not different from zero. Liquidity ratio of the bank had negative relationship with total loans and advances but statistically significant/different from zero. This result also inline to the study expectation.

With regard to macroeconomic variables, cash reserve requirement ratio, gross domestic product, annual inflation rate, and annual average exchange rate of the birr to us dollar have negatively correlated with total loans & advances with correlation coefficient of -0.4844, -0.2899, -0.1223 and -0.4822 respectively. The negative relationship of cash reserve requirement ratio and annual inflation rate with loan and advance was in line with the study hypothesis; but cash reserve requirement ratio had statistically different from zero/statistically significant and inflation rate had statistically insignificant/ not different from zero. But, the negative relationship of gross domestic product and annual average exchange rate of the birr to us dollar with total loans & advances goes up against to the expectation of the study.

4.3. Testing the Classical Linear Regression Model (CLRM) Assumptions

The study performed the test of regression assumptions. The objective of the model is to predict the strength and direction of association among the dependent and independent variables. Thus, in order to maintain the validity and robustness of the regression result of the research in classical linear regression model, it is better to satisfy basic assumption classical linear

regression model. As noted by Brooks (2008), when these assumptions are satisfied, it is considered as all available information is used in the model. However, if these assumptions are violated, there will be data that left out of the model. Accordingly, before applying the model for testing the significance of the slopes and analyzing the regressed result, the errors equal zero mean test, normality, heteroscedasticity, autocorrelation and multicollinearity tests are made for identifying misspecification of data if any so as to fulfill research quality.

4.3.1. Testing for the Average value of the error-term is zero

The first CLRM assumption requires, the average value of the errors term should be zero. As per Brooks (2008), if a constant term is included in the regression equation, this assumption will never be violated. Therefore, since the constant term was included in the regression equation, this assumption is expected to be not violated.

4.3.2. Test for heteroskedasticity assumption ($\text{var}(u_t) = \sigma^2 < \infty$)

In the classical linear regression model, one of the basic assumptions is Homoscedasticity assumption that states as the probability distribution of the disturbance term remains same for all observations. That is the variance of each u_i is the same for all values of the explanatory variable. However, if the disturbance terms do not have the same variance, this condition of non-constant variance or non-homogeneity of variance is known as heteroscedasticity (Bedru and Seid, 2005). To check this, ARCH test was applied. The ARCH tests of the null hypothesis that the error variances are all equal versus the alternative that the error variance are a multiplicative function of one or more variables.

Table 4.3: Heteroskedasticity Test

Heteroskedasticity Test: ARCH test

Heteroskedasticity Test: ARCH

F-statistic	0.405429	Prob. F(1,87)	0.5260
Obs*R-squared	0.412825	Prob. Chi-Square(1)	0.5205

Source: own computation through E-views 9

As the above table shows heteroskedasticity test ARCH concluded that there is no significant evidence for the presence of heteroskedasticity. Since the p-values were above 0.05, the null hypothesis of homoscedasticity is failed to reject at 5 percent of significant level. This implying that there is no significant evidence for the presence of heteroskedasticity in these research models.

4.3.3. Test for absence of autocorrelation assumption (cov(ui , uj) = 0 for i _= j)

In this section, we checked if there exists any autocorrelation problem with the data. If there exists covariance between the residuals and it is nonzero, this phenomenon is called autocorrelation (Brooks, 2008). To test for autocorrelation,the study used Breusch-Godfrey Serial Correlation LM Test.

Table 4.4: Autocorrelation Test: Breusch-Godfrey Serial Correlation LM Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.046316	Prob. F(2,78)	0.3561
Obs*R-squared	2.351487	Prob. Chi-Square(2)	0.3086

Source: own computation through E-views 9

As indicated in the above table 4.6 the P value of F-staticse Breusch-Godfrey Serial Correlation LM test was 0.3561 that was beyond the significance level of 5%. Hence, the null hypothesis of no autocorrelation is failed to reject at 5 percent of significance level. This implying that there is no significant evidence for the presence of autocorrelation in this model. Therefore, we can say that there is no autocorrelation problem in this study.

4.3.4. Test of normality (ut~N(0, σ2))

This study also relies on the Jargue-Bera test where a null hypothesis of normality is tested against the alternative hypothesis of non-normal distribution. 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 Skeweness and kurtosis are zero and three respectively. Skewness refers to how symmetric the residuals are around zero. Perfectlysymmetric residuals will have a skewness of zero. Skewness measures the extent to which a distribution is not symmetric about its mean value. Kurtosis refers to the ‘‘peakedness’’

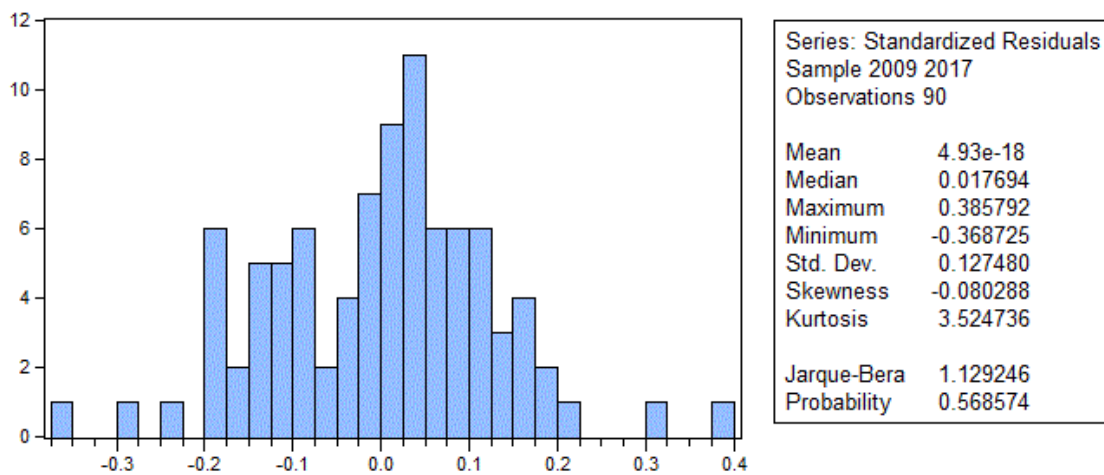
of the distribution. For a normal distribution the kurtosis value is 3. Kurtosis measures how fat the tails of the distribution are, the Jarque–Bera test for normality is based on two measures, skewness and kurtosis. For normal distribution the JB statistic is expected to be statistically indifferent from zero. 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 90 was equal to the frame was large; the study considered the BJ test also. If the residuals are normally distributed, the histogram should be bell-shaped and BJ statistic would not be significant. The p-value of the normality test should be bigger than 0.05 to not reject the null of normality at 5% level.

The hypothesis of normality distribution is:

H0: residuals follow a normal distribution

H1: residuals do not follow a normal distribution

Figure 4.1: Normality test for residuals



As shown in the histogram in the above skewness and kurtosis approaches to zero (i.e. -0.0803) and Three (i.e. 3.525) and the Jarque-Bera statistics (i.e. 1.12925) was not significant even at 5% level of significance as per the P-values shown in the histogram in the appendix was 0.5686. Hence, the null hypothesis that the error term is normally distributed should not be rejected. Therefore it is possible to say that error terms follow normal distribution.

4.3.5. Test for multicollinearity

Multicollinearity is a test that evaluates whether the independent variables are highly correlated. Its condition exists where there is high, but not perfect, correlation between two or more explanatory variables leading to unreliable and unstable estimates of regression coefficients hence causing strange results when attempting to study how well individual independent variables constitute to an understanding of the dependent variable (Cameron and Trivedi 2009; Wooldridge 2006) The consequences of Multicollinearity are increased standard error of estimates of the Betas, meaning decreased reliability and often confusing and misleading results. How much correlation causes multicollinearity however, is not clearly defined. Though, there is no consistent argument on the level of correlation that causes multicollinearity, Hair et al 2006(cited in Habtamu 2012) argues that correlation coefficient below 0.9 may not cause serious multicollinearity problems. According to Hair et al (2006), the results in the table blow correlation matrix table 4.5 shows that the highest correlation of +ve0.7636 and -ve0.802 which is between liquidity ratio and cash reserve requirement rate, and liquidity ratio & investment portfolio ratio respectively, there is no correlation coefficient that exceeds or even near to 0.90. Thus, in this study there is no problem of multicollinearity, hence all the variables were retained for use in the estimations.

Table 4.5: Correlations matrix of explanatory variables

	CR	IP	BSIZ	VD	LR	CRR	GDP	INFR	EX
CR	1.0000								
IP	-0.3685	1.0000							
BSIZ	-0.1798	0.5329	1.0000						
VD	0.0236	0.2278	0.4554	1.0000					
LR	0.3852	-0.802	-0.7283	-0.4494	1.0000				
CRR	0.45	-0.73	-0.4670	-0.0501	0.7636	1.0000			
GDP	0.0695	-0.182	-0.2828	-0.1176	0.2805	0.3208	1.0000		
INFR	0.0043	0.0256	-0.0791	0.0586	0.1718	0.1967	0.5452	1.0000	
EX	0.3087	-0.659	-0.4564	-0.1007	0.7227	0.7464	0.1367	0.4909	1.0000

Source: Own estimation of research data through E-views 9 (2018)

4.4. Choosing Random effect (RE) Vs fixed effect (FE) models

The E-views 9 software was used to carry out the multiple regression equations in order to see if our predictor variables are statistically significant and the kind of impact they have on our explanatory variable. The results so far indicate that all CRLM assumptions are not violated, so

the ordinary least square regression can be safely applied. With panel/cross sectional time series data, the most commonly estimated models are probably fixed effect and random effects models.

The simplest types of fixed effects models allow the intercept in the regression model to differ cross-sectionally but not over time, while all of the slope estimates are fixed both cross-sectionally and over time. The random effects approach proposes different intercept terms for each entity and again these intercepts are constant over time, with the relationships between the explanatory and explained variables assumed to be the same both cross-sectionally and temporally (Brooks, 2008). To examine whether individual effects are fixed or random, a Hausman specification test was conducted providing evidence in favor of the REM model (Baltagi, 2005).

The Hausman test hypothesis is

H0: Random effect model is appropriate

H1: Fixed effect model is appropriate

Table 4.6: Correlated Random Effects - Hausman Test

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.000000	9	1.0000

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

Source: Own estimation of research data through E-views 9 (2018)

Table 4.6 above shows Hausman specification test, the P-value of a model is 1.0000, which is more than 5% level of significance.

Hence, the null hypothesis of the random effect model is appropriate is failed to reject at 5 percent of significant level.

This implying that, random effect model is more appropriate than fixed effect model and gives more comfort that random effects model results are valid (see Appendix-7 for detail).

4.5. Regression analysis results and its Interpretation

The study ran the overall regression analysis to determine the level of significance of the effects of bank’s specific factors and macroeconomic factors on determinant of lending of PCBs in Ethiopia. Panel data approach takes care of the presence of varying variance of the error terms across all the observations in the panels and any serial correlation. As presented in the table blow the regression result of random effect model that examines the determinant of lending of PCBs in Ethiopia the beta coefficient may be negative or positive; beta indicates that each variable’s level of influence on the dependent variable. P-value indicates at what percentage or precession level of each variable is significant. “R-squared” explain how much percent of the variance in the dependent variable in the regression accounted for. ‘S.E.’ of regression shows how far is the estimated standard deviation of the error term. Similarly, adjusted R² 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.

Operational model:

The empirical model used in this study to identify the statistically significant determinants of Ethiopian private commercial bank’s lending measured by log of total loan and advance was:

$$LOA_{i,t} = \beta_0 + \beta_1(CR_{i,t}) + \beta_2(BSIZ_{i,t}) + \beta_3(IP_{i,t}) + \beta_4(VD_{i,t}) + \beta_5(LR_{i,t}) + \beta_6(CRR_{i,t}) + \beta_7(GDP_t) + \beta_8(INFR_t) + \beta_9(EX_t) + u_{i,t} \dots \dots \dots (3)$$

Table 4.7: Random effects model regression results of the study

Dependent Variable: LOA
 Method: Panel EGLS (Cross-section random effects)
 Date: 06/03/18 Time: 22:13
 Sample: 2009 2017
 Periods included: 9
 Cross-sections included: 10
 Total panel (balanced) observations: 90
 Wallace and Hussain estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.330884	0.192073	-1.722702	0.0888
CR	0.248460	0.150061	1.655724	0.1017
IP	-0.163805	0.077350	-2.117725	0.037**
BSIZ	1.033258	0.016452	62.80332	0.0000*
VD	-0.292320	0.098620	-2.964108	0.0040*
LR	-0.377265	0.047128	-8.005045	0.0000*
CRR	-0.001599	0.089229	-0.017917	0.9857
GDP	0.203496	0.058682	3.467775	0.0008*
INFR	-0.347850	0.076646	-4.538396	0.0000*
EX	0.567340	0.167417	3.388786	0.0011*

Effects Specification		S.D.	Rho
Cross-section random		0.017906	0.2809
Idiosyncratic random		0.028651	0.7191

Weighted Statistics			
R-squared	0.994402	Mean dependent var	4.478028
Adjusted R-squared	0.993772	S.D. dependent var	0.364052
S.E. of regression	0.028731	Sum squared resid	0.066036
F-statistic	1578.863	Durbin-Watson stat	1.470157
Prob(F-statistic)	0.000000		

Unweighted Statistics			
R-squared	0.995068	Mean dependent var	9.515301
Sum squared resid	0.089409	Durbin-Watson stat	1.085837

Source: own computation through E-views 9

The starred coefficient estimates are significant at the 1 % (*) and 5 % (**) level.

4.5.1. Interpretation of Regression Results

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

$$LOA_{i,t} = -0.331 + 0.248(CR_{i,t}) + 1.033(BSIZ) - 0.164(IP_{i,t}) - 0.292(VD_{i,t}) - 0.377(LR_{i,t}) - 0.002(CRR_{i,t}) + 0.204(GDP_t) - 0.348(INFR_t) + 0.567(EX_t) \dots \dots \dots (4)$$

As shows in the table above the regression result of random effect model that examines the determinant of lending of PCBs in Ethiopia had an R-squared of 0.9944 shows satisfactory levels, which mean that nearly 99.44 percent of the volatilities in the loan and advance, are explained by the volatilities of independent variables included in the equation for the test period. The remaining 0.66% of changes was explained by other determinants which are not included in

this model. Therefore, an adjusted R-square having value of 0.9937 shows that 99.37 percent of dependent variable is explained by the independent variables included in the model. Thus, the explanatory power of the model is high. The regression F-statistic takes a value of 1578.8 with p-value of 0.000000 which is used to measure the overall significance of the model. F-statistics tests the null hypothesis that all of the slope parameters (β 's) are jointly zero. In the above case p-value of zero attached to the test statistic shows that this null hypothesis should be rejected even at 1% level of significance.

As presented on the table above, bank size (SIZE), investment portfolio (IP), volume of deposit (VD), liquidity ratio (LR), real gdp growth (GDP), inflation rate (INF) and exchange rate (EX) had statistically significant factors affecting lending of Ethiopian private commercial banks which is measured by log of total loan and advance. From the statistically significant variables, bank size (SIZE), real gdp growth (GDP), and exchange rate (EX) had positively related with loan and advance(LOA) where as investment portfolio (IP), volume of deposit (VD), liquidity ratio (LR), and inflation rate (INF) have negatively related with loan and advance(LOA).

As it can be seen from the above table also, bank size (SIZE), volume of deposit (VD), liquidity ratio (LR), real gdp growth (GDP), inflation rate (INF) and exchange rate (EX) had statistically significant influence on Ethiopian private commercial bank's lending (LOA) at 1% significant level. Investment portfolio (IP) was one of statistically significant variables that had statistically significant impact on loan and advance (LOA) at 5% significant level. Credit risk ratio(CR) and cash reserve requirement ratio(CRR) were statistically insignificant impact on loan and advance(LOA). The regression result shows that, PCBs loan and advance increases with increasing value of bank size, real gdp growth rate, exchange rate and investment portfolio while decrease with higher value of volume of deposit, liquidity ratio, inflation rate and investment portfolio. On the other hand the coefficient sign of bank size, investment portfolio, real gdp growth rate, inflation rate, cash reserve requirement ratio and exchange rate were in-line with the study expectations whereas the coefficient sign of volume of deposit, liquidity ratio and credit risk ratio were oppose the study expectation.

A. Credit Risk ratio(CR) and Loans and Advances (LOA)

Credit risk ratio of the Study was measured by the ratio of (loan loss reserve) to gross loans. The coefficient of credit risk ratio was 0.248 and its p-value is 0.1017. This indicate that holding other independent variables constant at their average value, when credit risk ratio increased by one percent, total loans and advances (LOA) of sampled private commercial banks would be increased by 0.248 percent. And also credit risk ratio was statistically insignificant even at 10 present level of significance; and similar with Mitiku (2014) but it is significant in his study. Thus, the positive coefficient and its statistically insignificant impact on loan and advance tend to reject the hypothesis(1) stated credit risk ratio has negative and significant impact on PCBs lending. Meaning credit risk ration not affect or determine the PCBs lending in the study period.

B. Investment Portfolio (IP) and Loans and Advances (LOA)

An investment portfolio in this study was measured by banks total investment over total assets has an estimated coefficient of -0.163805 in the loan and advance regression, which means that a 1 unit increase in investment; generate 0.163805 decreases in volume of lending. Investment of PSBs shows a negative and significant (at 5 percent significant level, p-value 0.037) impact in its relationship with the banks' lending volume; which was oppose with the study expectations reject the null hypothesis(2) stated that investment portfolio has positive and significant impact on PCBs of Ethiopia loan and advance. In Ethiopian banks, investment portfolios are undiversified and limited. Bank's investments in debt instruments as well as equity instruments are less due to small and illiquid capital market limited to treasury bills. Hence, the finding of the research is plausible that investments in Ethiopian PCBs adversely affected the volume of loan and advance.

C. Bank Size(BSIZ) and Loans and Advances (LOA)

Bank size of PCBs in Ethiopia in this study was measured by log of total asset of each bank. As the regression result shows bank size was positive and statistically significant (at 1% level) impact on loan and advance was consistent with hypothesis (3) and in line with the assumption that according to the “too big to fail” argument, large banks would benefit from an implicit guarantee, thus decrease their cost of funding and allows them to invest in riskier assets (Iannotta et al. 2007). Therefore, “too big to fail” status of large banks could lead to moral hazard behavior and excessive risk exposure. If big banks are seeing themselves as “too big to fail”, their motivation to hold liquid assets is limited and illiquid asset which is loan increases. The

coefficient of bank size is 1.03326 and its p-value is 0.0000. This indicate that holding other independent variables constant at their average value, when bank size ratio increased by one percent, total loans and advances (LOA) of sampled private commercial banks would be increased by 1.0333 percent and statistically significant at 1% level of significant as indicated above. Therefore, the researcher failed to rejects the null hypothesis that bank size ratio has a positive impact on loans and advances. This is consistent with existing studies such as (Amano.G. 2014 and Mitiku, 2014) that bank size indeed contributes significantly to loan supply. Furthermore, bank size has high coefficient value of 1.03326; the implication of this is that this explanatory variable has high impact and influence on the lending volume of PCBs and a change in it will yield the highest change in banks' loans and advances. Therefore banks should strive hard to manage their asset efficiently so that their objective of profitability can be achieved and the multiplier effects maintained to the maximum.

D. Volume of Deposit (VD) and Loans and Advances (LOA)

As shows in regression result above that, the coefficient of volume of deposit (VD) measured by the ratio of total customer deposit to capital (total asset) ratio was -0.29232 and its P-value is 0.0399 and statistically significant at 1% level of significant. Therefore, the researcher rejects the null hypothesis (4) that volume of deposit has positive impact on loans and advances. Holding other independent variables constant at their average value, when volume of deposit (VD) increased by one percent, total loans and advances (LOA) of sampled private commercial banks would be decreased by 0.29 percent. This is because of at the time of inflation central bank may force financial institutions to hold financial instruments other than landing.

There for, it may not be desirable to rely too heavily on deposits as banks with greater deposit levels are more likely to be affected at times of bank runs (Laidroo, 2010). Gorton & Winton (2000) in their study showed that banks can create more or less liquidity by simply changing their funding mix on the liability side. Therefore, PCBs in Ethiopia need to actively manage their deposits portfolios in terms of demand, time and saving deposits which are of very different nature of unpredictability and risk of run out.

E. Liquidity Ratio(LR) and Loans and Advances (LOA)

Liquidity ratio was measured by the ratio of current asset to current liabilities portrays a negative significant relationship with the banks' loan and advance with a slope coefficient of -0.377265. The implication of this relationship is that if liquidity ratio increases by 1%, the loans to total

assets of the banks will decrease by 0.377265. This explanatory variable is significant at 1% level of alpha with a probability value of 0.0002. Thus, the hypothesis(5): liquidity ratio has negative and significant impact on bank's lending should be fail to rejected. Liquidity allows banks to meet any unexpected expenses without having to liquidate other assets. When banks are unable to fund their loans or make payments on debt, they will be very unwilling to lend. Thus, a low liquidity reduces commercial banks' lending. The result of Amano(2014), Olokoyo, F (2011) and Olumuyiwa (2012) also exhibited a negative relationship between liquidity and lending and it was significant.

F. Cash Reserve Requirement (CRR) and Loans and Advances (LOA)

In this study cash reserve requirement ratio was measured by the ratio of cash required reserves to total asset has a slope coefficient of -0.0016 with p value of 0.9857 as shows in the regression result and statistically insignificant even at 10 percent significant level. Therefore, the researcher failed to rejects the null hypothesis (6) that cash reserve requirement has positive and statistically significant impact on loans and advances. But the sign was in-line with the study expectation which is similar to the Berhanu(2016). The relationship of cash reserve requirement to the loan and advance volume shows that an increase in 1% cash reserve requirement ratio leads to a decrease in loan and advance volume by 0.0016%. Thus, the higher the reserve requirements from the central bank, the lower the amount of loan and advance PCBs is willing to give to the public.

G. Gross Domestic Product (GDP) and Loans and Advances (LOA)

Gross domestic product was measured by percentage of the rate of change of real GDP growth annually with coefficient of 0.2035 and p value 0.0001 has positive statistically significant relationship at 1% level of significance with private commercial bank lending for the test period which agrees with Mitku, (2014), Olokoyo, (2011), and berhanu, (2016) finding. The result was in-line with the study expectations tend to fail to reject the null hypothesis(7) stated that gross domestic product has positive and significant impact on PCBs of Ethiopia volume of loan and advance. Therefore, the relationship between gross domestic product to the loan and advance volume shows that an increase in 1% gross domestic product ratio leads to an increase in loan and advance volume by 0.2035%. When GDP is raise demand is high that businesses expand hence firms demand for bank lending is high.

H. Inflation Rate(INFR) and Loans and Advances (LOA)

Inflation rate is one of macroeconomic variable included in this study was measured by annual inflation rate of Ethiopia during the study period. Inflation had negative and statistically significant impact on loan and advance of Ethiopian PCBs at 1% significant level with a slope coefficient of -0.348 and p value of 0.0000 was consistent with hypothesis (8): inflation has negative and significant impact on loan and advance of Ethiopian PCBs. The implication of this relationship is that if inflation rate increases by 1%, the loans to total loan and advance of the banks will decrease by 0.348 percent. This negative relation was in-line with the theories argue that inflation rate and loan and advance have negative relationship. Since 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. Similarly, the result was consistent with the findings of Emon, (2012), Naceur, (2009) and Tanr, (2006).

I. Exchange rate(EX) and Loans and Advances (LOA)

Exchange rate is the last variable included in this study was measured by annual average exchange rate of the birr to US dollar during the study period with coefficient of 0.867 and p value 0.0011 has positive statistically significant relationship at 1% level of significance with private commercial bank lending. The result was in-line with hypothesis (9): exchange rate has positive and significant impact on loan and advance of Ethiopia PCBs. The implication of this relationship is that if exchange rate increases by 1%, total lending of the banks will increase by 0.867 percent by holding others study variable on average; this shows that as the Commercial bank Loan and advance increases in the economy, annual average exchange rate of birr to dollars also increases overtime.

4.6. Summary of the discussions

From regression result, the study discovered that independent variables all have both positive and negative statistical relationship with commercial banks' lending. This implies that these variables are very important factors considered by commercial banks in their decisions to give out loans. Similarly, the results indicated that there was a positive linear relationship between the lending decision of Ethiopia PCBs and bank size, GDP and exchange rate and statistically significant. The result was in-line with hypothesis (3, 7 & 9): bank size, GDP and exchange rate has positive and significant impact on loan and advance of Ethiopia PCBs. It further found out that there was

an inverse relationship between the lending decision; and investment portfolio, cash reserve requirement ratio and annual inflation rate; and statistically significant. The result was opposed with hypothesis (3): investment portfolio has positive and significant impact on loan and advance of Ethiopia PCBs; in lined with hypothesis (8): annual inflation rate has negative and significant impact on loan and advance of Ethiopia PCBs. Similarly, volume of deposits and liquidity ratio has negative and significant impact on loan and advance of Ethiopia PCBs but the result opposes the study expectation of hypothesis (4): volume of deposits has positive and significant impact on loan and advance of Ethiopia PCBs by its sign; and in lined with the hypothesis (5): liquidity ratio has negative and significant impact on loan and advance of Ethiopia PCBs. Credit risk ratio had a positive and statistically non-significant effect on bank lending of Ethiopian PCBs but the result opposes the study expectation of hypothesis(1): credit risk ratio has positive and significant impact on loan and advance of Ethiopia PCBs whereas cash reserve requirement ratio had a negative and statistically non-significant effect on bank lending of Ethiopian PCBs and also the result opposes the study expectation of hypothesis(6): cash reserve requirement ratio has negative and significant impact on loan and advance of Ethiopia PCBs partially.

Table 4.8: Summary of actual and expected signs of explanatory variables on the dependent variables

Independent Variables	Expected Relationships with LOA	Actual result	Statistical Significance test	Hypothesis Status
Credit risk ratio	Negative	Positive	Insignificant	Reject
Investment portfolio	Positive	Negative	Significant at 5%	Reject
Bank size	Positive	Positive	Significant at 1%	Failed to Reject
Volume of Deposits	Positive	Negative	Significant at 1%	Reject
Liquidity Ratio	Negative	Negative	Significant at 1%	Failed to Reject
Cash Reserve Requirement Ratio	Negative	Negative	Insignificant	Failed to Reject
Annual real GDP growth	Positive	Positive	Significant at 1%	Failed to Reject
Annual inflation rate	Negative	Negative	Significant at 1%	Failed to Reject
Exchange Rate of the Birr to US Dollar	Positive	Positive	Significant at 1%	Failed to Reject

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1. CONCLUSIONS

The main objective of this study is to establish the main determinants of private commercial banks' lending decision in Ethiopia private commercial banks. The study was used nine years panel data for the sample of ten private commercial banks in Ethiopia which had nine years of banking service over the period 2009-2017. The secondary data of this study were acquired from annual audited financial reports of the respective sampled banks, NBE and MoFED. The credit risk ratio, investment portfolio, bank size, volume of deposit, liquidity ratio, cash reserve requirement ratio, GDP, inflation rate and exchange rate were used as independent variables. Total loan and advance was used as dependent variable. Secondary panel data was presented and analysed by using descriptive statistics, correlation analysis and random effect regression analysis through E-views 9 statistical software to identify the determinants of lending of Ethiopian private commercial banks which were measured by log of total loan and advance. While before performing the regression analysis, test for CLRM assumption were conducted including multicollinearity, heteroskedacity, normality and autocorrelation test. The results showed that the CLRM assumptions were satisfied and subsequently the data were subjected to further statistical analysis.

The study ran the overall regression analysis to determine the level of significance of the effects of microeconomic factors and macroeconomic factors on total loan and advance. Microeconomic factors which are bank specific in the study were credit risk ratio, investment portfolio, bank size, volume of deposit and liquidity ratio whereas macroeconomic factors were cash reserve requirement ratio, GDP, inflation rate and exchange rate.

As the regression results showed, investment portfolio, bank size, volume of deposit, liquidity ratio, GDP, inflation rate and exchange rate were significant in determining lending decision of sampled Ethiopian private commercial banks whereas credit risk ratio and cash reserve requirement ratio was not significant at all levels. This implies that these variables are very important factors considered by commercial banks in their decisions to give out loans. Among other factors bank size had very strong, positive and statistical significant; hence, high bank size

has increased in lending volume that banks need to keep on asset as same also encourage borrowing and vice versa. Credit risk ratio had a positive and statistically non-significant effect on bank lending of Ethiopian PCBs whereas cash reserve requirement ratio had a negative and statistically non-significant effect on bank lending of Ethiopian PCBs. Thus, that credit risk ratio and cash reserve requirement ratio does not contribute significantly to bank lending decision of Ethiopian PCBs. As the result showed investment of PCBs has a negative and significant impact in its relationship with the banks' lending volume. Similarly, bank size, GDP and exchange rate were positive and statistically significant impact on loan and advance of Ethiopia PCBs. Also the findings showed Volume of deposits, liquidity ratio and inflation rate has a negative and significant influence on lending volumes among PCBs in Ethiopia.

5.2. Recommendations

- Loan portfolio is the largest asset and source of revenue for banks. Therefore, its administration requires considerable skill and dexterity on the part of the bank management. So that lending must be handled effectively for the banks to remain attractive and retain their customers. Hence, Ethiopian private commercial banks should strive hard to manage their loan portfolio effectively to achieve their profitability objective and the multiplier effects maintained to the maximum.
- And also, private commercial banks therefore adjust their lending decision in response to the signals from these factors, such that positive signals make banks become more favorably disposed to lending and vice versa.
- Similarly, Ethiopian private commercial banks need to work more towards improving their bank size, it was very strong, positive and statistically significant factor of lending among all variable. Hence, strength the bank size encourages their lending ability and diversify loan portfolio at the same time credit risk will be minimized.
- Based on the finding of the study, among bank specific factors investment portfolio, volume of deposit and liquidity ratio were statistical significant and inverse relation with Ethiopia private commercial banks. Thus Ethiopian private commercial banks shall give priority to develop credit procedures, policies and analytical capabilities and these efforts should be expanded into full credit management including origination, approval, monitoring and problem management tailored to the needs of each bank.

- Finally, on the positive and significant relationship established between real GDP growth rate and exchange rate with lending decision the study recommends this is a clear signal to all commercial banks in Ethiopia that they cannot ignore the macroeconomic indicators when strategizing to improve their lending decision. Thus, banks in Ethiopia should not only be concerned about internal structures and policies/procedures, but they must consider both the internal environment and the macroeconomic environment together in developing their strategies to efficiently manage their loan portfolio.

5.3. **Future Research Recommendations**

The study investigated the determinants of private commercial banks' lending decision in Ethiopia using secondary data of macroeconomic and bank specific variables and from supply side only. There is need for consideration of more other factors in future studies like regulatory factors, socioeconomic environment and incorporating the demand side determinants using primer and secondary data.

REFERENCE

- Adedoyin , & Sobodun. (1996). Commercial Banks Lending Activities in Nigeria. Nigerian Financial Review, 9(3), 36-37.
- Adegboyega, O.I.(2012) Mergers and Acquisition and Banks Performance in Nigeria. JORIND, 10(2), 159-308.
- Aisen. A, Franken. M (2010) “Bank credit during the 2008 financial crisis: A cross country comparison” IMF working paper, February, p1-25, www.imf.org.
- Alkilani. Q. A, Kaddumi. T.A (2015) “Cyclicality of lending behavior by banking sector for the period (2000...2013): evidence from Jordan” International Journal of Economics and Finance, vol 7, n°4, p57-65.
- Amano, G. (2014). Determinates of lending Behavoiur of Banks: A Case study on Commercial Banks of Ethiopia. MSc Project Paper. Unpublished, Addis Ababa University.
- Arun , T., & Turner, j. (2004). Corporate Governance of Banks in Developing Economies: Concepts and Issues. An International Review, 12, 371-377.
- Athanasoglou, P., Brissimis, S., & Delis, M. (2008). Bank-specific, Industry-specific and Macroeconomic Determinants of Bank Profitability. International Financial Markets, Institution and Money, 18, 121-36.
- Ayadi, N and Boujelbene, Y (2012), “The Determinants of the Profitability of the Tunisian Deposit,” Banks IBIMA Business Review Vol. 2012, Article ID 165418, 21 pages 9.
- Baltagi, B. (2005). Econometric Analysis of Panel Data (3 ed.). Chichester: John Wiley & Sons.Ltd.
- Bedru Babulo and Seid Hassen (2005): Econometrics Module as Teaching Material for Distance Students Majoring In Economics; Mekelle University
- Berger. A.N, Udell. G.F (2006) “A more complete conceptual framework for SME Finance” Journal of Banking and Finance, vol 30, issue 11, p2945-2966.
- Berhanu, A. (2016). Determinants of lending decision and their impact on financial performance of commercial banks in Ethiopia. MSc Project Paper. Unpublished, Addis Ababa University.
- Bessis, J. (2002): Risk Management in Banking, 2nd ed John Wiley & Sons, Chichester,UK.
- Blundell, R. and Bond, S. (1998). “Initial Conditions and Moment Restrictions in Dynamic Panel Data Models.” Journal of Econometrics Vol.87, No. 1, pp.115–43.
- Boyd, H.B., and Runkle, D.E., 1992. “Size and performance of banking firms”, Journal of

- Monetary Economics, Vol. 31, pp 47–67.
- Brooks, C. (2008). *Introductory Econometrics for Finance* (2 ed.). New York: Cambridge University Press.
- Brown, K. and Moles, P. (2012), *Credit Risk Management*, Edinburgh Business School, Heriot – Watt University, U.K.
- Cameron, A C and Trivedi, P K 2009, *Micro econometric Using Stata*, Stata Press Publication, USA.
- Cargill, T.F. & Mayer. T. (2006). The Effect of Changes in Reserve Requirements During the 1930s: The Evidence from Nonmember Banks. *Journal of Economic History*, 66 (2), 417-432.
- Carletti, E, Cerasi, V & Daltung, S 2006, „Multiple-Bank Lending: Diversification and Free-riding in Monitoring“, Working Paper, Department of Statistics: Università degli Studi di Milano Bicocca,
- Chen, K. and Pan, C. (2012). An Empirical Study of Credit Risk Efficiency of Banking Industry in Taiwan, *Web Journal of Chinese Management Review*, 15(1), 1-16.
- Christian, G. & Pascal, T. (2012). The Macroeconomic Effects of Reserve Requirements. WIFO Working Papers, No. 420.
- Chernykh. L, Theodossiou. A (2011) “Determinants of bank long term lending behavior: Evidence from Russia” *Multinational Finance Journal*, vol 15, n°1, p193-216.
- Chodechai, S 2004, *Determinants of Bank Lending in Thailand: An Empirical Examination for the years 1992 – 1996*, Unpublished Thesis.
- Chodecal D (2004) *Impact of lending policy on banking industry in Nigeria*, Journal, vol 7, pg 12-22, Unity Press limited.
- Comptroller’s Handbook 1998, *Loan portfolio management*, Comptroller of the Currency Administrator of National Banks, USA.
- Cooper, M., Jackson W., And Patterson (2003), " Evidence of predictability in the cross-section of bank stock returns," *Journal of Banking and Finance* , Vo. 27, No. 1, pp. 817-850.
- Davidson, P. (1978). *Money in the Real World*. London: Macmillan.
- Degryse, H, Masschelein, N & Mitchell, J 2004, „SMEs and Bank Lending Relationships: the Impact of Mergers“, Working Paper, No. 46, National Bank of Belgium.
- Demirguc-kunt, & Huizinga. (1999). Determinants of Commercial Bank Interest Margins and Profitability: Some International Evidence. *The World Bank Economic Review Journal*.

- Diamond, D., & Rajan, R. (1998). *Liquidity Risk, Liquidity Creation and Financial Fragility: A Theory of Banking*. Working paper. University of Chicago.
- Dietrich, A. and Wanzenried, G., (2011), “Determinants of Bank profitability before and during the crisis: Evidence from Switzerland”, *Journal of International Financial Markets, Institutions and Money*, 2, 307-327
- Djiogap. F, A. Ngomsi (2012) “Determinants of bank long term lending behavior in the central African Economic and Monetary Community (CEMAC)” *Review of Economic and Finance*, p107-114.
- Ezirim, F. (2005). *Impact of Bank Lending on Liquidity of Bnaks in Banks in Nigeria*. 2, 44-56. IJJS Publication.
- Greuning, H., & Bratanovic, S. (2003). *Analyzing and Managing Banking Risk: a Framework for Assessing Corporate Governance and Financial Risk* (2 ed.). Washington DC: The World Bank.
- Gujarati, DN. (2004): *Basic Econometric*, 4th edn., McGraw–Hill, USA.
- Hair, J F, Black, W C, Babin, B J, Anderson, R E, and Tatham, R L 2006, *Multivariate Data Analysis*, 6th edn., New Jersey: Pearson Education.
- Ituwe , C. (1985). *Elements of Practical Banking*. Handbook. Ibadan University Press.
- Iwedi, M., & Onuegbu, O. (2014). *Credit Risk and Performance of Selected Deposit Money Banks in Nigeria: An Empirical Investigation*. *European Journal of Humanities and Social Science*, 31(1), 1684-1694.
- Kapoor, S. (2013). *Banks: How They work and Why are They Fragile*.
- Karceski, J, Ongena, S & Smith, DC, 2004, „The Impact of Bank Consolidation on Commercial Borrower Welfare“, *Journal of Finance*, vol. 60, no. 4, pp. 2043-2082, doi:10.1111/j.1540-6261.2005.00787.x, <http://dx.doi.org/10.1111/j.1540-6261.2005.00787.x>.
- Karimi, (2006). *Performance of Kenyan Banking System during Years 2004-2005*. Bank Press.
- King and Levine (1993). *Finance and Growth: Schumpeter might be Right*. *Quarterly Journal of Economics*, Vol 108, issue 3, pp.717-737.
- Kishan , R., & Opiela, T. (2000). *Bank Size, Bank Capital and the Bank Lending Channel*. *Journal of Money, Credit and Banking*, 32(1), 121-41.
- Lartey, C., Antwi, S., & Boadi, K. (2013). *The Relationship Between Liquidity and Profitability of Listed Banks in Gahana*. *International Journal of Business and Social Science*, 4(3), 48-56.

- Mac Donald, SS and Koch, TW 2006, Management of Banking, 6th edn, U.S.A.
- McCarthy, M., Schneider, D., & Tibb, S. (2010). Investments and Loans Reported by the 10 Largest U.S Bnaks'. *Journal of Bank Accounting and Finance*, 19-24.
- Meyers, L., Gamut, G., & Guarino, A. (2006). *Applied Multivariate Research: Design and Interpretation. Handbook.* London New Delhi: SAGE Publications.
- Miller, S., and Noulas (1997)," Portfolio mix and large-bank profitability," USA.
- Mitku, M. (2014). Determinants of Commercial Banks Lending: Evidence from Ethiopia Commercial Banks. *European Journal of Business and Management*, 6(20).
- Mohammed, A. (2014). What Influences Banks' Lending in Sub-Saharan Africa. *Journal of Emerging Market Finance*, 13(1), 1-42.
- Montoro. C, R. Moreno (2011) "The use of reserve requirement as a policy instrument in Latin America" *BIS Quarterly Review*.
- National Bank of Ethiopia (NBE). (2016).Annual Report, Addis Ababa, Ethiopia
- Nwankwo, G.O. (2000), "Organizing for Financial Risk Management," *The Credit Administrator*, vol. 2 No.2, pp. 32-39.
- Olokoyo, F 2011, „Determinants of commercial banks“ lending behavior in Nigeria“, *International Journal of Financial Research*, vol. 2, no. 2, pp. 61-72.
- Olumuyiwa , OS , Oluwatosin, OA, and Chukwuemeka, OE, (2012) , Determinants of Lending Behaviour Of Commercial Banks: Evidence From Nigeria,“ *Journal Of Humanities And Social Science*, vol. 5, no. 5 , pp.71-80.
- Olusanya , S., Oyebo, A., & Ohadebere, E. (2012). Determinants of Lending Behavior of Commercial Banks: A Co-Integration Analysis. *5(5)*, 71-80.
- Ommeren, St. van (2011). Banks' Profitability: An Examination of the Determinants of Banks' Profitability in the European Banking Sector. Master thesis submitted to Erasmus University Rotterdam (Unpublished)
- Ongena, S & Smith, D C 2000, "What Determines the Number of Bank Relationships?: Cross Country Evidence", *Journal of Financial Intermediation*, pp. 26-56,
- Owolabi, A. & Ajayi, N.O. (2013) Financial Efficiency in pre and post merger and Acquisition of banks in Nigeria. *Journal of Global Business and Economic Research*, 2 (7), pp12-27.
- Prutean-Podpiera, A. (2007). The Role of Banks in the Czech Monetary Policy Transmission Mechanism. *Economics of Transition*, 12(1), 268-273.

- Rababah. M (2015) “Factors affecting the bank credit: an empirical study on the Jordanian commercial banks” *International Journal of Economic and Finance*, vol 7, n^o5, p166-178.
- Read , E., & Gill, E. (1989). *Commercial Banking* (4 ed.). New Jersey: Engle wood cliffs.
- Saini, P., & Sindhu, J. (2014). Role of Commercial Bank in the Economic Development of India. *International Journal of Engineering and Management Research*, 4(1), 27-31.
- Sapeinza (2004) “The effects of government ownership on bank lending” *Journal of Financial Economics*, vol 72, p357-364.
- Sebastian. O, Uremandu (2009) “Banking systems credits to the domestic Economy and national development” *Annals of University of Bucharest, Economic and Administrative Series*, n^o3, p149-160.
- Sharma, P., & Gounder, N. (2012). *Determinants of Bank Credit in Small Open Economies: A case of Six Pacific Island Countries*. Desicssion Paper Finance. Griffith Business School, Griffith Unversity.
- Stiglitz and Weiss 1981, *Analysis of Loan and disbursement in the Commercial Bank*, 2nd edn, pp. 44-49, Macgraw Hill Publication limited, Uhomoibhi.
- Suresh, R. (2012) *Deposit, Lending and Recovery Performance of Pandyan Grama bank, Tamil Nadu: An Analysis*. *Indian Journal of Finance*, Vol. 6, No. 1
- Tomak. S (2013) “Determinants of commercial bank lending behavior: Evidence from Turkey” *Asian journal of Empirical research*.
- Tomola M. O (2013). *An Analysis of the deposits and lending behaviours of Banks in Nigeria*. *International journal of engineering and management sciences*. Vol 4, issue 1. pp 46-54.
- Uchida. H, Udell. G.F, Watanabe. W (2007) “Bank size and lending relationship in Japan” NBER.
- Ugwuanyi, G.O. (2014) *Banking Distress and the Erosion of Public Confidence in. The Nigerian Banking System*. *European Journal of Business and Management*, 6 (9).
- Vazakidis, A. and Adamopoulos, A. (2009). *Credit market development and economic growth*, *American Journal of Economics and Business Administration*, vol 1, issue 1, pp.34-40.
- Wilcox. J (1982) “Excess Reserve in the great depression” working paper, university of California, Berkely, www.haas.berkeley.edu.
- Wooldridge, JM 2006, *Introductory Econometric: A Modern Approach*, International Student edition, 3rd edn., Canada: Thomson South–Western.

APPENDIXES

Appendix-1: Descriptive statistics of study variables over the period of 2009-2017

Date: 06/03/18 Time: 21:06
Sample: 2009 2017

	LOA	CR	IP	BSIZ	VD	LR	CRR	GDP	INFR	EX
Mean	9.515301	0.025139	0.151670	9.866073	0.760488	0.443455	0.126271	0.252801	0.123873	0.091716
Median	9.599723	0.020730	0.180106	9.932686	0.770046	0.406518	0.100129	0.223761	0.084641	0.058348
Maximum	10.35365	0.157211	0.307753	10.62299	0.844294	0.940217	0.369793	0.451589	0.380441	0.200207
Minimum	8.053078	0.000000	0.000000	8.506505	0.573209	0.166143	0.035736	0.121023	0.027069	0.046139
Std. Dev.	0.451296	0.024587	0.094419	0.419013	0.051877	0.193236	0.081364	0.107453	0.102195	0.059266
Skewness	-0.836596	2.499477	-0.483711	-0.915035	-1.028431	0.511493	0.984730	0.613757	1.703823	1.041169
Kurtosis	3.574107	12.11167	1.958119	3.752419	4.416123	2.223567	3.227475	1.980190	4.681468	2.334637
Jarque-Bera Probability	11.73438 0.002831	405.0450 0.000000	7.580335 0.022592	14.68234 0.000648	23.38532 0.000008	6.185065 0.045387	14.73944 0.000630	9.550522 0.008436	54.14769 0.000000	17.92066 0.000128
Sum	856.3771	2.262467	13.65033	887.9465	68.44396	39.91092	11.36436	22.75213	11.14854	8.254457
Sum Sq. Dev.	18.12646	0.053804	0.793434	15.62589	0.239515	3.323286	0.589190	1.027609	0.929506	0.312605
Observations	90	90	90	90	90	90	90	90	90	90

Appendix-2: Correlation Matrix of Dependent and Independent Variables

	LOA	CR	IP	BSIZ	VD	LR	CRR	GDP	INFR	EX
LOA	1.000000	-0.184586	0.532507	0.994432	0.455280	-0.758378	-0.484422	-0.289882	-0.122276	-0.482230
CR	-0.184586	1.000000	-0.368493	-0.179777	0.023594	0.385201	0.449971	0.069451	0.004295	0.308722
IP	0.532507	-0.368493	1.000000	0.532872	0.227785	-0.801647	-0.730354	-0.182210	0.025576	-0.658809
BSIZ	0.994432	-0.179777	0.532872	1.000000	0.455397	-0.728312	-0.467046	-0.282806	-0.079116	-0.456433
VD	0.455280	0.023594	0.227785	0.455397	1.000000	-0.449403	-0.050082	-0.117582	0.058574	-0.100724
LR	-0.758378	0.385201	-0.801647	-0.728312	-0.449403	1.000000	0.763629	0.280464	0.171826	0.722666
CRR	-0.484422	0.449971	-0.730354	-0.467046	-0.050082	0.763629	1.000000	0.320796	0.196740	0.746386
GDP	-0.289882	0.069451	-0.182210	-0.282806	-0.117582	0.280464	0.320796	1.000000	0.545215	0.136687
INFR	-0.122276	0.004295	0.025576	-0.079116	0.058574	0.171826	0.196740	0.545215	1.000000	0.490926
EX	-0.482230	0.308722	-0.658809	-0.456433	-0.100724	0.722666	0.746386	0.136687	0.490926	1.000000

Appendix-3: Heteroskedasticity Test

Heteroskedasticity Test: ARCH

F-statistic	0.405429	Prob. F(1,87)	0.5260
Obs*R-squared	0.412825	Prob. Chi-Square(1)	0.5205

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 06/03/18 Time: 21:55

Sample (adjusted): 2 90

Included observations: 89 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.001022	0.000271	3.772160	0.0003
RESID^2(-1)	-0.068075	0.106912	-0.636733	0.5260
R-squared	0.004638	Mean dependent var		0.000956
Adjusted R-squared	-0.006802	S.D. dependent var		0.002354
S.E. of regression	0.002362	Akaike info criterion		-9.236658
Sum squared resid	0.000485	Schwarz criterion		-9.180734
Log likelihood	413.0313	Hannan-Quinn criter.		-9.214117
F-statistic	0.405429	Durbin-Watson stat		2.004274
Prob(F-statistic)	0.525971			

Appendix-4: Autocorrelation Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.046316	Prob. F(2,78)	0.3561
Obs*R-squared	2.351487	Prob. Chi-Square(2)	0.3086

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 06/03/18 Time: 21:50

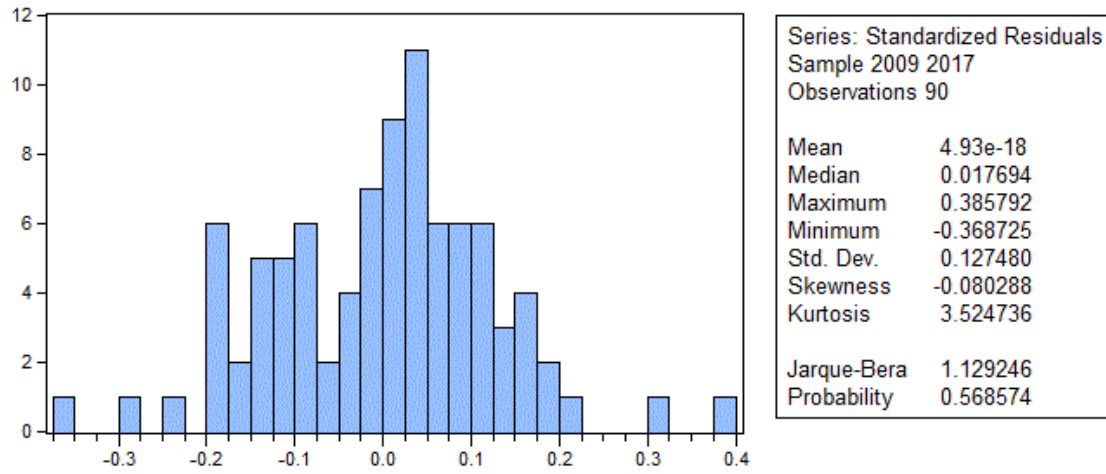
Sample: 1 90

Included observations: 90

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.045650	0.168296	-0.271248	0.7869
CR	-0.028940	0.164532	-0.175893	0.8608
IP	-0.012758	0.080816	-0.157864	0.8750
BSIZ	0.003102	0.013370	0.232013	0.8171
VD	0.021118	0.093204	0.226575	0.8213
LR	0.002302	0.051278	0.044902	0.9643
CRR	-0.006466	0.100333	-0.064448	0.9488
GDP	0.005224	0.062381	0.083749	0.9335
INFR	-0.000892	0.081364	-0.010961	0.9913
EX	0.001630	0.179200	0.009098	0.9928
RESID(-1)	-0.085921	0.114836	-0.748212	0.4566
RESID(-2)	0.141065	0.119538	1.180089	0.2416
R-squared	0.026128	Mean dependent var	-1.80E-15	
Adjusted R-squared	-0.111213	S.D. dependent var	0.031250	
S.E. of regression	0.032942	Akaike info criterion	-3.864545	
Sum squared resid	0.084646	Schwarz criterion	-3.531237	
Log likelihood	185.9045	Hannan-Quinn criter.	-3.730136	
F-statistic	0.190239	Durbin-Watson stat	1.902393	
Prob(F-statistic)	0.997746			

Appendix-5: Normality Test



Appendix-6: Multicollinearity test

	CR	IP	BSIZ	VD	LR	CRR	GDP	INFR	EX
CR	1.000000	-0.368493	-0.179777	0.023594	0.385201	0.449971	0.069451	0.004295	0.308722
IP	-0.368493	1.000000	0.532872	0.227785	-0.801647	-0.730354	-0.182210	0.025576	-0.658809
BSIZ	-0.179777	0.532872	1.000000	0.455397	-0.728312	-0.467046	-0.282806	-0.079116	-0.456433
VD	0.023594	0.227785	0.455397	1.000000	-0.449403	-0.050082	-0.117582	0.058574	-0.100724
LR	0.385201	-0.801647	-0.728312	-0.449403	1.000000	0.763629	0.280464	0.171826	0.722666
CRR	0.449971	-0.730354	-0.467046	-0.050082	0.763629	1.000000	0.320796	0.196740	0.746386
GDP	0.069451	-0.182210	-0.282806	-0.117582	0.280464	0.320796	1.000000	0.545215	0.136687
INFR	0.004295	0.025576	-0.079116	0.058574	0.171826	0.196740	0.545215	1.000000	0.490926
EX	0.308722	-0.658809	-0.456433	-0.100724	0.722666	0.746386	0.136687	0.490926	1.000000

Appendix-7: Correlated Random Effects - Hausman Test

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.000000	9	1.0000

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

** WARNING: robust standard errors may not be consistent with assumptions of Hausman test variance calculation.

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
CR	0.265207	0.248099	0.005129	0.8112
IP	-0.146354	-0.164161	0.001061	0.5845
BSIZ	1.047658	1.033026	0.000240	0.3453
VD	-0.347948	-0.291140	0.002714	0.2755
LR	-0.377744	-0.377239	0.000398	0.9798
CRR	0.018380	-0.002039	0.001419	0.5878
GDP	0.221937	0.203235	0.001268	0.5994
INFR	-0.370615	-0.347512	0.002975	0.6719
EX	0.620432	0.566534	0.010881	0.6054

Cross-section random effects test equation:

Dependent Variable: LOA

Method: Panel Least Squares

Date: 06/03/18 Time: 21:24

Sample: 2009 2017

Periods included: 9

Cross-sections included: 10

Total panel (balanced) observations: 90

Period SUR (PCSE) standard errors & covariance (d.f. corrected)

WARNING: estimated coefficient covariance matrix is of reduced rank

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.442734	0.262734	-1.685100	0.0964
CR	0.265207	0.167637	1.582036	0.1181
IP	-0.146354	0.104096	-1.405944	0.1641
BSIZ	1.047658	0.023218	45.12267	0.0000
VD	-0.347948	0.111639	-3.116717	0.0026
LR	-0.377744	0.063283	-5.969165	0.0000
CRR	0.018380	0.103146	0.178194	0.8591
GDP	0.221937	0.066692	3.327799	0.0014
INFR	-0.370615	0.104884	-3.533567	0.0007
EX	0.620432	0.225202	2.755005	0.0075

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.996755	Mean dependent var	9.515301
Adjusted R-squared	0.995933	S.D. dependent var	0.451296
S.E. of regression	0.028782	Akaike info criterion	-4.073072
Sum squared resid	0.058815	Schwarz criterion	-3.545335
Log likelihood	202.2882	Hannan-Quinn criter.	-3.860257
F-statistic	1211.716	Durbin-Watson stat	1.676750
Prob(F-statistic)	0.000000		

Appendix-8: Random effects model regression results

Dependent Variable: LOA
 Method: Panel EGLS (Cross-section random effects)
 Date: 06/03/18 Time: 21:14
 Sample: 2009 2017
 Periods included: 9
 Cross-sections included: 10
 Total panel (balanced) observations: 90
 Wallace and Hussain estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.330884	0.192073	-1.722702	0.0888
CR	0.248460	0.150061	1.655724	0.1017
IP	-0.163805	0.077350	-2.117725	0.0373
BSIZ	1.033258	0.016452	62.80332	0.0000
VD	-0.292320	0.098620	-2.964108	0.0040
LR	-0.377265	0.047128	-8.005045	0.0000
CRR	-0.001599	0.089229	-0.017917	0.9857
GDP	0.203496	0.058682	3.467775	0.0008
INFR	-0.347850	0.076646	-4.538396	0.0000
EX	0.567340	0.167417	3.388786	0.0011

Effects Specification		S.D.	Rho
Cross-section random		0.017906	0.2809
Idiosyncratic random		0.028651	0.7191

Weighted Statistics			
R-squared	0.994402	Mean dependent var	4.478028
Adjusted R-squared	0.993772	S.D. dependent var	0.364052
S.E. of regression	0.028731	Sum squared resid	0.066036
F-statistic	1578.863	Durbin-Watson stat	1.470157
Prob(F-statistic)	0.000000		

Unweighted Statistics			
R-squared	0.995068	Mean dependent var	9.515301
Sum squared resid	0.089409	Durbin-Watson stat	1.085837