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

DETERMINANTS OF PRIVATE COMMERCIAL BANKS LENDING IN ETHIOPIA

BY: TAYE HAILE

A THESIS SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES OF ADDIS ABABA UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN ACCOUNTING AND FINANCE

ADVISOR: SEWALE ABATE (PHD)

JUNE, 2020

ADDIS ABABA, ETHIOPIA

Declaration

I, Taye Haile, hereby declare that the thesis work entitled "**Determinants of Private commercial banks lending in Ethiopia**" submitted by me for the award of the Degree of Master of Science in Accounting and Finance from Addis Ababa University at Addis Ababa Ethiopia, isoriginal work and it hasn't been presented for the award of any other Degree, Diploma,Fellowship or other similar titles of any other university or institution.

Declared by:

Name: Taye Haile

Signature_____

Date_____

Confirmed by Advisor:

Name: Dr. Sewale Abate

Signature: _____

Date: _____

Certification

Addis Ababa University

This is to certify that the thesis prepared by Taye Haile entitled: "***Determinants of Private Commercial Banks Lending in Ethiopia"*** and submitted in partial fulfillment of the requirements for the Degree of Master of Science in Accounting and Finance complies with the regulations of the university and meets the accepted standards with respect to originality and quality.

Approved by Board of Examiners:

Sewale Abate (PhD)	_____	_____
Advisor	Signature	Date
Zenegnaw Abiy (PhD)	_____	_____
External Examiner	Signature	Date
Alem Hagos (PhD)	_____	_____
Internal Examiner	Signature	Date

Chair of Department or Graduate Program Coordinator

Acknowledgements

First and foremost thanks goes to the Almighty God who gave me power and patience in every endeavor of my life. Next, I would like to extend my deeper indebtedness to my advisor Dr. Sewale Abate for his professional guidance, constructive comments, and invaluable suggestions. Moreover, my biggest gratitude goes to NBE and MoF as well as their staff members for facilitating and providing me the relevant data for my thesis work. Finally, my great thanks go to all my friends who provided me a moral support and all the necessary assistance in completing my thesis work.

Table of Contents

List of Tables

List of Figures

List of Acronyms

AIB: Awash International Bank S.C

BOA: Bank of Abyssinia S.C

CAR: Capital Adequacy Ratio

CBO: Cooperative Bank of Oromia

CR: Credit Risk

CRr: Reserve Requirement

DB: Dashen Bank S.C

GDP: Gross Domestic Product

INFr: Inflation Rate

LIR: Lending Interest Rate

LQr: Liquidity Ratio

MoF: Ministry of Finance

MQ: Management Quality

NBE: National Bank of Ethiopia

NIB: Nib International Bank S.C

NPL: Nonperforming Loans

OIB: Oromia International Bank S.C

OLS: Ordinary Least Square

ROA: Return on Assets

TLA: Total Loans and Advances

UB: United Bank S.C

VD: Volume of Deposit

WB: Wogagen Bank S.C

ZB: Zemen Bank S.C

Abstract

The objective of the study was to investigate the determinant factors of private commercial banks lending in Ethiopia. Balanced panel data was collected from audited annual financial statements of private commercial banks, National Bank of Ethiopia (NBE) and Ministry of Finance (MoF) to analyze the bank-specific determinants as well as the macroeconomic determinants of private commercial banks lending. The collected balanced panel data was analyzed with descriptive statistics, and multiple linear regression analysis. Random effect panel regression model was used for the data of ten private commercial banks in Ethiopia for the sample covered the period from 2009 to 2018. Ten explanatory variables that affect banks lending were selected and analyzed with STATA 11 econometrics software package. The results of panel data regression analysis showed that Capital adequacy ratio (CAR), Volume of deposit (VD), Return on Asset(ROA) and Lending interest rate(LIR) had positive and statistically significant effect on bank's lending .Credit risk(CR), Cash reserve requirement (CRr) and Liquidity ratio(LQr) had negative and statistically significant effect on bank's lending. Management quality (MQ), Gross Domestic Product (GDP), and Inflation rate (INFr) had negative correlation but statistically insignificant with commercial banks lending. The study suggests that Ethiopian private commercial banks should/need to work more to improve their volume of deposit, capitalization, reduce their credit risks and consider macroeconomic environment when extend loans.

***Key words*:** *lending, loan and advances, private commercial banks, determinants*.

CHAPTER ONE

INTRODUCTION

1.1. Background of the study

From ancient times, since the discovery of money, there have always been those who possess surplus funds which they may not need for their immediate use, referred to as surplus economic units and those who lack the cash to finance their current needs. Those with the excess money started extending credit to finance the needs of those with cash shortage for a consideration leading to the evolution of credit (Olusanya*et al.*, 2012).

The system was characterized by direct lending where the players were directly engage with each other. It involved the surplus units (lenders) and the deficit units (borrowers) directly search out themselves and dealing directly, thus the lender taking all the risk by its self (McKinnon, 2005), (kapoor, 2013).

Lending practices in the world could be traced back to the period of the industrial revolution which increases the speed of commercial and production activities thus bringing about the need for large capital outlays for projects. Similarly, in the modern period, it is a widely accepted fact that lending is the main service of commercial banks which contributes to economic growth and development since the capital outlays needed for most developmental projects comes mainly from banks (Olusanya*et al.*, 2012).

The evolution of the system has since seen the rise of indirect lending slowly replacing the direct lending. Indirect lending involves the pooling of deposits from various surplus units (firms, government, and individuals) by banks and extending loans to those in need of money. The commercial banks will then compensate the depositors with interest on their deposits and assumes the risk of default (McKinnon, 2005).

In order to functions this maturity transformation, banks accept deposits 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 their clients at a higher rate and usually longer duration. 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).

On macroeconomic bases formal banks provide a big role in saving mobilization, and financial asset allocation institutions. Consequently, these roles make them to have an important impact on economic growth and development through investment. However, commercial bank's decisions to extend loans are affected by a lot of factors such as the deposit level, interest, and cash reserve required and liquidity ratio to mention a few (Olokoyo, 2011) and(Malede, 2014).

The supply of bank loan is under the pressure of both internal and external determinants. The internal determinants are termed as micro or bank-specific determinants of bank lending, while the external determinant factors are macroeconomic level variables that are not related to banks management but reveal the monetary, economic and legal environment factors that influence the operation and performance of financial institutions (Kishan&Opiela, 2000).

The banking industry is rapidly growing in Ethiopia. There are about seventeen commercial banks in Ethiopia during the study period out of which one and the giant is owned by the state and the remaining sixteen are private (shareholder's property) commercial banks. All commercial banks are highly regulated by the National Bank of Ethiopia. Therefore; the lending aspect of banking operations is determined by both bank-specific, external regulatory and macroeconomic factors.

This study aimed to investigate the effect of common determinants of private commercial banks lending or loans and advances; and thereby, to provide empirical evidence about the effects of capital adequacy, volume of deposit, cash reserve requirement ratio, credit risk, liquidity ratio, lending interest rate, management quality, return on asset gross domestic product, and inflation on Ethiopian private commercial bank's lending.

1.2. Statement of problem

Lending is a major service rendered by banks which contributes immensely to their revenue generation. The loans can either be in short term, medium and/or long term basis depending on the type of need being addressed. Lending is, therefore, a major driver in aiding the economic activities of households, firms, and governments which has a bearing on the economic growth and development of any nation. Thus, economic growth is generated through bank lending activities which provide resources for real investment (Mckinnon, 2005).

The major existenceof commercial banks is to provide credit facility to their customers. In the distribution of funds to the loan portfolio, the primary objective of banks management is to generate profit while serving the credit needs of its community (Read and Gill, 1989).

Commercial bank loans for businesses and non-financial institutions always play an important role within an economy. These loans give a chance to individuals and businesses to expand and develop their business, which in turn will increase output and employment. An increase in output and employment will then result in an increase in welfare for a country or region. Although there are many other variables that may cause the increase of welfare, commercial bank loans are among the most important factors that contribute to development (Olumuyiwa, 2012).

The commercial bank lending has significant roles in igniting industrialization in every economy, by facilitating the mobilization of capital which lubricate the wheels of economic production. But the sound and viable functioning of commercial banks are adversely affected by the choice of certain policy instruments for the regulation of banking operations. Such includes a strictly administered interest rate, Directed credit, unremunerated reserve requirements and stabilizing liquidity control measures; the volume of cash in the bank's vault also determines its ability to grant loan and advances, they should stock reasonable quantity of cash to meet customers demand (Olumuyiwa, 2012).

The loan supply extended by commercial banks is usually expressed as a function of internal and external determinant factors. The internal factors are termed as micro or bank-specific determinants of bank lending, whereas the external factors are macroeconomic determinants that are not associated to the banks management but reveal the monetary, economic and legal atmosphere that impact the operation and performance of banks. Studies on bank lending behavior have noted that, bank-specific factors have a capacity to clarify the behavior of credit delivery (Kishan&Opiela, 2000), (Kashyap and Stein, 2000) and (Gaiotti&Secchi, 2006).

On the other hand, bank lending is also affected by the ownershipstructure of banks. Bank lendingbehavior is not uniform and it is various in terms of ownership structure of banks.Privately owned commercial banks usually aim at profit maximization, while governmentownedbanks have a tendency to follow social welfare oriented objectives and diverge from strict profit maximization(Noth, 2011) and (Behr et al., 2013).

On the other side, the credit creation course exposes banks to credit risk and liquidity problem which in turn leads to loss. From this we can realize that commercial banks have to balance their goals between earning a profit and managing the risk from lending activities. In the world of business, as a rule any successful business has to meet its customer needs and make revenue (Barrickman, 1990). Similarly, successful financial institution ought to meet up the desperate desires of depositors and borrowers. Depositors look for high rates, short terms and no risk, while borrowers look for low rates and long terms. Financial institutions are therefore, in the risk intermediation business. To be winning, financial institutions, commercial banks in particular, shouldappropriately underwrite risk, manage and monitor the risk assumed (Barrickman, 1990).

In general, as financial intermediaries, banks play a significant role in the operation of an economy. This is mainly true in the case of Ethiopia where no capital market is found. Hence, banks are the principal providers of funds, and their stability is more important to the stability of financial system as a whole. Since 1905 banks in Ethiopia carry out several banking business like attracting of deposits and extending loan and advance to deficit unit for the sake of increasing their investment capacity (Malede, 2014).

Accordingly, the type of service provided by commercial banks as well as their fund mobilization capacity is increasing through time. However, there are several factors that affect the lending of commercial banks all over the world which is also true in the case of Ethiopian commercial banking industry. Hence, without understanding these factors good quality bank performance or profit would be difficult. While there are many empirical studies on the determinant factors of lending of commercial banks in developedcountries, there are only a few studies on the lending of commercial banks in developing economies like Ethiopia.

In Ethiopia, to the best of the researcher knowledge, the only empirical studies conducted on the area of lending determinants of commercial banks are the research under taken by (Malede, 2014), (Amano, 2014), (Aytenew, 2016) and (Zelalem, 2017) having public as well as private owned commercial banks together in the sample. In their study allof them studied determinants of lending decision of commercial banks in Ethiopia by incorporating huge government Commercial Bank of Ethiopia in the sample which is incomparable with emerging private commercial banks in the country that will lead to the biased conclusion of the study result.On the other side, the researchers did not incorporate in their study,

management quality and return on asset explanatory variables to test these variables impact in Ethiopian private commercial banks lending.

The big concern of researcher to choose the title purposively is some existing researches are biased on selection of sampled commercial banks; State-owned banks had big comparative advantage during commercial banks competition market because of state-oriented advantage, asset, and capital accumulation, seventy-six years extended experience is difficult to face similar determinants with infant private commercial banks (Average 10 Years experiences) in Ethiopia. Then the researcher excludes the state-owned commercial bank of Ethiopia.

Besides, the researcher had more than three years direct, experience in the area of lending in Awash Bank one of the biggest private commercial bank next to government commercial bank of Ethiopia. Based on his observation experience the major gap on the empirical finding on existing the above-listed papers are theoretically the strong variable GDP, cash reserve, liquidity ratio, lending interest rate, and volume of deposit had different impact on the bank lending with comparable econometrics model, data size, purposive sample selection and variable selection the final result had heterogeneous characteristics then the researcher try to find the exact reason and fill the gap.

1.3. Objective of the study

1.3.1. General Objective

The main objective of the study was to investigate the determinants of private commercial banks lending in Ethiopia.More specifically, the study had the following specific objectives.

1.3.2. Specific Objectives

The specific objectives were;

- To examine the impact of capital adequacy and volume of deposit on private commercial banks lending.
- To examine the impact of cash reserve requirementand credit risk on private commercial bankslending.
- To examine the impactof banks liquidity and lending interest rate on private commercial bankslending.

- To examine the impactof GDP growthand inflationon private commercial banks lending.
- To examine the impact of management quality and return on asset on private commercial banks lending.

1.4. Research questions

- How capital adequacy ratio and volume of deposit affect private commercial banks lending?
- How cash reserve requirement and credit risk affect private commercial banks lending?
- How liquidity ratio and lending interest rate affect private commercial banks lending?
- How realGDP growth and inflationrate affect private commercial banks lending?
- How management quality and return on asset affect private commercial banks lending?

1.5. Hypothesis of the study

In accordance with objective of the study the following hypotheses were formulated for investigation. Hypotheses of the study stands on the theories related to loan that has been developed over the years by different researchers and past empirical studies related to commercial banks lending. The theories of the literature review were used to establish expectations for the relationship of the different determinants of lending. Hence, based on the objective, the present study has developed and tested the following tenhypotheses.

H1: Capital adequacy has a positive and significant impact on private commercial banks lending.

H2: Volume of deposit has a positive and significant impact on private commercial banks lending.

H3: Credit risk has a negative and significant impact on private commercial banks lending.

H4: Liquidityhas a positive and significant impact on private commercial banks lending.

H5: Lending interest rate has a negative impact on private commercial banks lending decision.

H6: Management quality has a positive and significant impact on commercial banks lending.

H7: Cash reserve requirement has a negative and significant impact on private commercial banks lending.

H8: GDPhas a positive and significant impact on private commercial banks lending.

H9. Inflation has a negative and significant impact on private commercial banks lending.

H10. Return on asset has a positive and significant impact on commercial banks lending.

1.6. Significance of the study

According to (Kothari, 2004) in addition to using as integral tool to facilitate the decisions of the policymakers research has special significance in solving various operational and planning problems of business and industry, way to attain a high position in the social structure and a mean to development of new styles and creative works.

The findings of the study will identify the relevant factors influencing the lending of private commercial banks in Ethiopia. This helps private commercial banks,National Bank of Ethiopia and Government (monetary and fiscal policymakers) in formulating appropriate policies that could enhance effective administration and management of loans, advances and other forms of lending by private commercial banks in the Ethiopian economy.

The outcome of the study will serve as literaturefor other researchers who have endeavor to conduct further research works in the area of lending of banks in the country. It also contributes to the available store of knowledge to the already existing knowledge in the area of the lending of commercial banks.

Furthermore, the finding of the study will have an immense benefit to private commercial banks in terms of using them as inputs in formulating guidelines with which to effectively manage their lending activities in the economy of the country.

1.7. Scope of the study

The scope of this study was focused on the investigation of the bank-specific and macroeconomic determinants of acommercial bank’slending in Ethiopia using secondary data. Due to the number of private commercial banks in the country are 16, this study assumed to consider a sample of private commercial banks. According to Kothari,(2004)

sampling rule; if the target population is less than hundred it is better to take all the target population as the sample of study that as the sample size approaches to the population, the results from the sample are appropriate to the total population. However, the study is concentrated to a sample of ten private commercial banks based on the availability of sufficient secondary data for the sample period of ten years from 2009 – 2018 G.C.Accordingly, Awash Bank, Dashen Bank, Wegagen Bank, Bank of Abyssinia, United Bank, Nib International Bank, Cooperative Bank of Oromia, Lion International Bank, Oromia International Bank and Zemen Bankare included in the sample since they are in full operation from the year 2009 to 2018 G.C.As a result, the sample has 10 private commercial banks out of 16 private commercial banks for the sample period of ten years.

The study used total loan and advances as a dependent variable and capital adequacy, deposit ratio, credit risk, liquidity ratio, lending interest rate, management quality, return on asset, real GDP growth rate, cash reserve requirement and inflation rate as explanatory variables.

1.8. Structureof the study

This study was mainly focused on identifying of the firm specific internal factors and macro level or external factors that impact the lending of commercial banks in Ethiopia. The study is organized into five chapters Chapter one provides a general introduction, statement of problem and objective of the study. Chapter two describes the review of theoretical and empirical related literatures. Chapter three provides a detailed description of the methodology employed by the study. Chapter four contains data presentation, analysis and interpretation. Finally, the last chapter five concludes the total work of the study and gives a conclusion and relevant recommendations based on the findings.

CHAPTER TWO

LETERATURE REVIEW

In this chapter the theoretical and empirical evidences focusing on the determinants of commercial banks lending are presented. Therefore, it is organized and presented in three sections. The first section discusses history of banking in Ethiopia. In section two determinants of commercial banks lending is discussed by taking into account the theoretical and empirical studies conducted in the area. Finally, driven conclusion based on reviewed literatures and briefly discussed knowledge gap in the relevant previous literatures.

2.1.Commercial banking in Ethiopia

The first period of introduction of modern banking, was started with the establishment of the Bank of Abyssinia in 1905. In 1908 a new development bank (SocieteNationale dEthiope Pour le Development del Agriculture et du Commerce) and two other foreign banks (BanquedelIndochine and the Compagnie delAfrique Orientale) were also established (Degefe, 1995 cited in Alemayehu, 2006). As noted in Alemayehu, (2006) these banks were criticized for being wholly foreign-owned. In 1931 the Ethiopian government purchased the Abyssinian Bank, which was the dominant bank, and renamed it the Bank of Ethiopia i.e., the first nationally owned bank on the African continent (Gedey, 1990, pp. 83, cited in Geda,2006).

During the five-years of Italian occupation (1936-1941) banking activity of the country was relatively expanded. As a result, most of the banks that were in operation during this period were Italian banks namely, Banco di Italy, Banco di Roma, Banco di Napoli, BancoNacionale, Casa de Creito and Society Nacionale di Ethiopia. During the exit of After Italy, where the role of Britain was paramount, Barclays Bank was established and it remained in business in Ethiopia between 1941 and 1943 (Degefe, 1995). This era lasted up to 1963 when the functions of Central Bank and Commercial Banks separated and private banks and insurance companies started to emerge.

The second phase of development is (1964-1974) referred to as a takeoff stage which accelerated growth until it was hampered by the nationalization measure of the socialist government. The establishment of privately owned Addis Ababa Bank in 1964 and its growing branch network created relatively better banking services among commercial banks.

The then monetary and banking system gave at the most emphasis on stability and balanced growth of the economy.

Following this, like the rest of the economic sector, the banking sector too entered its third phase (1975-1991) which was referred to as the stagnation period. During this period all the banks that emerged in the second phase were merged and the government left with only three banks namely: National Bank of Ethiopia (NBE), Commercial Bank of Ethiopia, and Agricultural and Industrial Development Bank.

The fourth phase is after the fall of the Derg regime in1991 when the liberalization policy introduced by the Federal Democratic Republic of Ethiopia (FDRE) in 1992 was a new era for the banking sector in the country (EEA, 2011). Currently, there are seventeen commercial banks in the country sixteen privately owned commercial banks and one state-owned commercial bank.

2.2. Theoretical framework on lending or loan and advances

2.2.1. Lending

Lending is the process of providing loans from one part to another. Loan providers are organized through financial institutions that lend money, on the manner and assumption to bring money after loan paid back schedules. Banks facilitate the exchange of intermediaries form, collecting from savers and then extending to borrowers as loans. Those activities benefit both the commercial banks and the borrowing economic unit.

The core mission of any commercial bank is providing loans for anyone or business societies who are interested to get financial assistance. Banks mobilize resource from those who have excess money and lend it to others adding interest rate for that needs money for a different purpose then banks have intermediary activity between saver and borrower. Banks have a unique role in the resolution of information asymmetry which means banks help the financial market to overcome asymmetric information by screening, contracting with and monitoring borrowers (ItanaAyana, 1994).

2.2.2. Lending objective

The main objective of commercial banks is making business in the form of lending which the money collected from depositor for borrowers because of to maximize their profit, although

other social and economic functions tend to deflect banks from profit maximization as their primary objective (Noth, 2011) and (Behr *et al.*, 2013). Because banks are acknowledged agents of social, economic and political development, they have a social responsibility. The extent of this expanded responsibility varies from country to country and the social situation is a major determining factor, hence the role of commercial banks as agents of development appears greater in developing countries of which Ethiopia is one. Nevertheless, the principal lending objectives of a bank are to provide growth, liquidity and finally making a profit. As the major source of bank revenue, the interest income contributes about 80% of commercial banks earnings (Vong*et al.,* 2009).

2.3. Sources of lending fund for commercial banks

The most important sources of funds for commercial banks include savings deposits, shareholders capital, and reserve funds. The word deposit represents the money in the funds of the bank's various deposit schemes. They include saving deposit, fixed time deposit, and demand deposit, banks accept customer deposits and utilize these funds to extend loans to other customers in need of fund or invest in other assets that will yield a return higher than the amount bank pays the depositor (Zelalem, 2017).

2.4. Loan pricing theory

The theory posits that banks cannot all the time set high interest rates by trying to generate high income through the interest rates. Commercial banks have to think about the moral risk since it is very difficult to estimate the borrower nature (Stiglitz and Weiss, 1991). If the interest rates are high, they may induce adverse selection problems because borrowers will be retreat because of high lending interest rates. Once these borrowers receive the loans, they may develop moral hazard conduct or so-called borrower moral hazard since they havepossibility to take on high risky projects or investments (Chodecai, 2004).

2.5. Multiple lending theories

Banks should be less inclined to share lending, both outside equity and mergerand acquirement increases banks loan extending capacity, thus reducing that need of greater diversification and monitoring through share lending.

2.6. Hold-up and soft budget constraint theories

Banksselection of multiple-bank lending is in terms of two inefficiencies disturbing exclusive bank-firm relationships, these are the hold-up and the soft-budget-constraint problems. Based on hold-up, sharing lending avoids the expropriation of informational rents. This improves firm's incentives to createappropriate investment choices and in turn, it increases bank's profits (Von Thadden, 2004; Padilla and Pagano, 1997). As for the soft budget constraint problem, multiple bank lending enables banks not to extend further inefficient credit, thus reducing firm's strategic defaults.

Both of the above theories consider multiple-bank lending as a way for banks to commit to entrepreneurs and improve their incentives. None of them, however, addresses how multiple bank lending affects bank's incentives to monitor, and thus can explain the apparent discrepancy between the widespread use of multiple-bank lending and the importance of bank monitoring.

Nevertheless, when one considers clearly bank'sincentive to examine multiple-bank lending may become abest way for banks with inadequate lending capacities to consign to higher monitoring levels. Despite involving free-riding and duplication of efforts, sharing lending allows banks to increase the number of loans and achieve greater diversification. This mitigates the agency problem between banks and depositors, and it improves bank's monitoring incentives (Carletti*et al.,* 2006).

2.7. The signaling arguments theory

The signaling argument states that well organized and capable companies should provide quite enough collateral this will be a signal for commercial banks and this makes them feel less risk on loan repayment and they try to set lower interest rates. Meanwhile, the reverse signaling argument states that banks only need collateral and or covenants for relatively risky firms that also pay higher interest rates (Chodechai, 2004; Ewert and Schenk, 1998).

2.8. Portfolio theory and bank lending

Financial portfolio theory thoughts are how banks make a strategy to find high profit and achieve their goals. In the financial market, the bank sector's profitability is determined by its ability to make the economy of scale for the customers. Careful loan effective risk mitigation

measure helps keep the occurrences of failure, profitability through specialization and the need to spread risk through diversification.

2.9. Loan able funds theory

According, to the loan able funds doctrine, the total amount of credit available in an economy can exceed private savings because the bank system is in a position to create credit; the interest rate is calculated on the basis of loan demand and supply. Keeping the same level of supply, an increase in the demand for loan able funds would lead to an increase in the interest rate and vice versa is true. Conversely, an increase in the supply of loanable funds would result in a fall in the rate of interest. If both the demand and supply of the loanable funds change, the resultant interest rate would depend much on the magnitude and direction of movement of the demand and supply of the loanable funds (Ewert*et al.,* 2000).

The loanable Funds Theory of Interest advocates that both savings and investments are responsible for the determination of the rates of interest in the long run. On the other hand, short term interest rates are calculated on the basis of the financial conditions of a particular economy. The determination of the interest rates in case of the Loanable Funds Theory of the Rate of Interest depends essentially on the availability of loan amounts. The availability of such loan amounts is based on certain factors like the net increase in currency deposits, the amount of savings made, willingness to enhance cash balances and opportunities for the formation of fresh capitals.

The Loanable Funds Theory of the Rate of Interest has similarities with the Liquidity-Preference Theory of Interest in the sense that both of them identify the significance of the cash balance preferences and the role played by the banking sector to ensure the security of the investment funds (Ewert*et al.,* 2000).

2.10. Credit market theory

A model of the neoclassical credit market postulates that, the storms of credits clear the market. If collateral and other drawbacks stay unchanged, the interest rate is the only factor with arising demand for loans and a given customer supply, the interest rate turn down and vice versa. It is thus supposed that the higher the failure risks of the borrower, the higher the interest premium (Ewert*et al.,* 2000).

2.11. The bank lending channel theory

The bank lending channel theory thought that during macroeconomic monetary policy action banks will restrict some loans for their customers, thus decline their need for investment independently of interest rates.

2.12. Transactions theory

Credit money created by commercial banks as primary rather than derived from central bank money credit money drives the monetary system; it does not claim that all money is credit money, though money is a commodity. A transaction does not always exist between the buyer and sellers the banks are a participant body. That is precisely what happened in the credit card or debit card transactions.

2.13. Money creation theory

In this theory, credit money is created by a loan extension such loan needs to be backed by central bank money but it is created from the promise embodied in the loan, not from the lending or lending of central bank money. When the loan is repaid, with interest the credit money of the loan is destroyed but reserves have created the profit from the loan. In practice, commercial banks extend the time of credit to companies a promise to make a loan. This promise is not considered money for regulatory purposes, and banks need not hold reserves against it, but when the line is tapped (and a loan extended). Then credit money is created, and reserves must be found to match it, in this case, credit money precedes reserves. In other words, making loans pulls reserves in instead of reserves being pushed out as loans which are assumed by the mainstream model.

2.15. The new theory of commercial banking and bank lending

Ahtiala, (2008) have developed a model of bank lending behavior in the presence of customer-specific capital and the critical nature of the loan decision, which are mainly due to joint production in information and transactions. Therefore, if the profits are independent across customers, the bank maximizes the expected present value of its profits by maximizing the product of the probability of the customer staying with the commercial bank and the specific capital of each customer.

The bank’s loan decision was shown to be asymmetrical. On the one hand, there is the marginal gain in the probability of the customer staying times all of the specific capital and

on the other the expected net marginal interest cost of the average loan stock, which does not include non-interest profits and is zero if the loan is not expected to increase the long-run stock. It improves the customer's loan terms, reallocating resources to profitable customers' projects.

It can be optimal to extend loans to a valuable customer at an interest rate loss. Cutting the loan rate is not always possible, however, partly because of the non-negativity of the interest rate and the prime rate convention, which accentuates the role of specific capital. Loyalty increases a customer's value to the bank but improves the customer's loan terms only to the extent that the customer makes it conditional on the loan extended.

There is no mechanism bringing about equilibrium where the bank is indifferent, at the margin, between lending to different customers. Therefore, banks are in the corner solutions that may be the rule rather than the exception in bank-customer relations. The best customers are immune to monetary policy if they are in a corner solution and the interest rate floor is binding. They can thus get all the loans on preferential terms in all conceivable situations, as is well known to practical bankers.

Finally, the harsh judgment on banks' lending to present problem debtors does not appear to be entirely justified when viewed in the light of the present approach. If non-interest earnings on the loans are taken into account in addition to net interest earnings and credit losses, the picture changes substantially Moreover, a potential or actual problem debtor can take advantage of the decision asymmetry when asking for a loan: it can force the bank to choose between making one more risky loan even with an expected loss in the hope of saving the entire specific capital, whereas by refusing the request the bank takes a high probability of losing much of the loan capital and all of the rest of specific capital(Zelalem, 2017).

On the whole, these theories suggest that the contribution of the banking system to the efficiency of resource allocation is likely to be smaller than has commonly been perceived. The banking services priced on the basis of risk. However, the locative effects of non-interest earnings on loan terms are likely to be a source of serious inefficiency, which can be expected to persist into the future. The economies of joint production are substantial, and recent product innovations in banking services have enhanced the significance of specific capital on resource allocation, whereas the switch to cost-based pricing has weakened it (Ahtiala, 2008).

2.16. Loan and Advances

Technically, loans and advances could simply be described as borrowed funds. It is that part of the money used for financing by an individual, a business or the government which does not belong to the borrower. Loans and advances could also be described as a debt, entailing the reallocation of financial asset over time, between the lender and the borrower. In loans and advances, the borrower initially receives or borrows money from the lender and is obligated to pay back to the lender at a later and appropriate time. The loans and advances are given at a cost usually referred to as the interest. In a legal loans and advances the obligations are enforced by agreements or contracts. The money may be paid back in block, in regular installments or in partial installments (Adepoju et al., 2007).

Loans and advances may be defined differently in the respective laws of different countries. In Ethiopia, under Article 4(6) of Directive № SBB/043/2008 loans and advances are defined as:

> "*Any financial asset of a bank arising from direct or indirect advances (i.e. unplanned overdrafts, participations in loan syndication, the purchase of loans from another lender, etc.) or commitment to advance funds by a bank to a person that are accustomed on the obligation of the person to pay back the funds, either on a specified date or dates or on demand, usually with interest."*

2.17. Determinants of commercial banks lending or loan and advances

The banks mobilize funds from the surplus spending units in order to bring financial costs down. Banks mostly transform liquid assets like deposits into illiquid assets like loans (Diamond &Rajan, 1998). This transformational process of bank's activity is at best influenced by a host of factors. Most literatures divide these factors in to two major categories that are: internal (microeconomic or bank-specific) and external (macroeconomic) factors (Peek &Rosengren, 1995). The internal factors (determinants) are within the control of the bank management whereas external factors (determinants) are variables that are not related to bank management but reflect the monetary, economic and legal environment that affect the operation and performance of financial institutions. 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.

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).

Liquidity ratio

Liquidity can be referred to as a state in which an asset can be readily converted into cash. A bank may be solvent by having enough assets to cover its liabilities but may remain illiquid. This may be due to a mismatch between its assets and liabilities (Kasman, 2010). This occurred due to the fact that banks transform the customers deposit to long term loans and advances. Thus, the transformation function and the demands by customers in terms of withdrawals from their deposits have to be met instantaneously (Kasman, 2010). Commercial banks, therefore, have to stock reasonable quantity of cash to meet their customer's demands. Because, bank's ability to grant loans and advances is checked by the available cash in its vault (Ituwe, 1985). Indeed, a commercial bank cannot afford to grant loans and advances in excess of its cashing ability. Therefore, the issue of liquidity in bank operations also affects the lending of commercial banks. Consequently, liquidity ratio is seen as an important variable in determining the supply of loans and advances (Ojo, 1978).

Volume of deposits

The lending activity is made possible only if the banks can mobilize sufficient funds from their depositing customers. Since commercial banks rely on depositor's money as a source of funds, it means that there are relationships between the ability of the banks to mobilize deposits and the amount of credit extended to the customers (Tomola, 2013).

As total deposit increase the total advance and loan increases proportionally (Ajay, 2007). An increase in deposit of a bank will improve its ability to lend more funds to its customers.

Capital Adequacy

Capital adequacy is the level of capital that commercial banks are required to hold to enable them withstand credit, market and operational uncertainty they are will be face. Generally, banks are anticipated to absorb the losses from the normal operation earnings. But there may be some unexpected losses which cannot be absorbed by normal operation earnings. In this time, capital plays an insurance role (Bouvatier&Lepetit, 2007). Adequate capital in banking sector is a confidence booster. It provides the clients, public and the regulatory authority with confidence in the continued financial feasibility of the bank. Confidence to the depositor that his money is safe; to the public that the bank will be, or is, in a position to give genuine consideration to their credit and other banking needs in good as in bad times and to the

regulatory authority that the bank is, or will remain, in continuous existence (Bouvatier&Lepetit, 2007). Any company or bank with inadequate capital faces hidden constraints (Djiogap and Ngomsi, 2012). Therefore increasing bank equity enhances the bank's capacity to increase lending. In addition, better capitalized banks can attract more creditworthy borrowers that will qualify for long term loans. But, some researchers argued that there is no relationship between capitalization level and supply of loans (Ehrmann et al., 2003).

In Ethiopia, as per Article 4(4.4) of Directive № SBB/050/2011, all licensed commercial banks in Ethiopia shall at a minimum preserve capital to risk weighted assets ratio of 8% at all times.

Credit Risk

Almost in all literatures Nonperforming loans (NPLs) used as a measure of the quality of banks loans portfolio. NPLs are a sum of borrowed money on which the borrower has not pays his or her scheduled payments for at least 90 days. A nonperforming loan is either in default or close to being in default (Malede, 2014). Once a loan is nonperforming, the odds that it will be repaid in full are considered to be substantially lower. If the debtor starts making payments again on a nonperforming loan, it becomes a re-performing loan, even if the debtor has not caught up on all the missed payments (Rajender, 2009). In general, the riskier the banking lending practices are, the higher their NPLs ratio should be. Therefore, nonperforming loan ratios are ought to be kept at minimum so as to reflect a state of good health on the portfolio of the banks. In addition level of non-performing loans in banks loan is an indication of the profitability of the bank lending activities. Credit risk in the form of NPLs is one of the crucial factors that have an impact on the financial health of a bank and growing NPLs is a challenge to banks, which will adversely affect the performance of banks (Baral, 2005) and (Rajender, 2009).

Lending Interest Rate

Bank lending rates are mostly seen as being rigid for the reason that they do not move in tandem with the markets. A number of explanations have been suggested to account for the rigidity in bank lending rates. In the case of loans, the rigidity has been as a result of the rationing of credit to borrowers owing to the fact that there are problems of asymmetric information (Blinder and Stiglitz, 1983). Indeed, financial markets are not perfect; in the presence of adverse selection and moral hazard issues, banks are more likely to opt for credit

rationing than to adjust their lending rates in a situation where there has been an upward adjustment of interest rates by the central bank. It may also be possible that when large banks capture large market share, the impact of tight monetary policy on bank lending will be minimal. However, Berger and Udell, (1992) could not find concrete support for the rationing of credit as a reason for the rigidity of lending rate. Therefore, if central bank reduces the rate, banks become reluctant to provide loan to firms and vice versa McKinnon, (2009). This variable is expected to have a negative relationship with commercial banks lending.

Return on Asset

Profitability of banks can be measured by return on its asset ratio and return on its equity ratio. These measures provide evidence on the performance of banks. More profit generating commercial banks can assist more credit to its customers. Moussa and Chedia, (2016) divided variables into two parts for Tunis banking sector, internal factors and external factors, and investigated the determinants of bank lending by using panel data for 18 banks over the period 2000 to 2013. The results of this study indicates that from the internal factors liquidity ratio, return on asset and return on equity are significantly and negatively affect the bank lending. Laidroo, (2012) investigated the determinants of lending growth of banks in 15 central eastern European countries for the period 2004-2010. The study found that there is significant and positive impact between profitability of bank and lending. BerlinandMester, (1998) analyzed the relationship between profitability and lending by using panel data of 126 banks. The study found that banks profitability has positive and significant impact on its lending. In another study Gunji and Yuan (2010), investigated the how banks profitability affect lending in China during the period 1985 – 2007. The result showed positive and significant influence between bank profitability and lending for the Chinese banking sector.

Management Quality

Management quality ratio is a determination of quality policy and its implementation by the use of significant plan and good management for the liquidity which impact the bank performance and the ability to lend (yazankudah, 2017). The qualities of any managers are achieving and hit the target of the company specially measured on gaining high profit from the low cost operation. Highly qualified management staff in the banks assumed to have good initiations to appreciate the lending and control all activities and tasks needed to maintain an expected result. The measurement used is total operating expense to total operating income of

the commercial banks (YazanQudah, 2017). This variable is expected to have a positive relationship with commercial banks lending.

Alhassan, (2013), studied the impact of management quality on banking lending behavior in Ghana by investigating 25 banks for the period from 2005-2010. The findings show negative and significant relationship between management quality and lending behavior in Ghana. Pham, (2015) investigated the determinants of bank lending for 146 countries and found that management efficiency has significant and positive impact on lending.

Gross Domestic Product

A strong economic condition measured by GDP, as motivating factor to banks has statistically significant impact on issuance of more private credit to businesses. A strong economic condition creates more demand for goods and services which lead to more investment in different sectors hence increase the per capita income as well as the savings, collectively these factors convince to banks to issue more private credit (kashif and mohammed, 2008).

In the study of (Guo and Stepanyan, 2011) indicated that domestic and foreign funding is positively associated with the economic growth. The stronger economic growth leads to higher credit growth.

Inflation

Many studies have focused attention on impact of inflation concerning lending, and conclude that inflation has a negative impact on interest margins (Afanasieff et al., 2002). Macroeconomic stability is having greater influence on bank lending policy. Because, the increase in uncertainty and inflation leads to reduction in the spread of bank loans (Baum et al., 2005). The study of Naceur, (2009) offered 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. However, it has been proven that for individuals and businesses, if their level of risk aversion vary widely it increases uncertainty (ambiguity-aversion). This drop in demand would lead to a decline in lending and therefore a decrease in performance. This variable is expected to have a negative relationship with lending of commercial banks (Baum et al., 2005) and (Naceur, 2009).

2.18. Empirical Literature in the area of lending

There are studies that have been conducted relating to the determinants of commercial banks lending. But there is limited related literature available in the Ethiopia commercial banking system about this context. However, other developed and emerging countries have conducted a lot of research related to this context.

Alhassan et al., (2013) studied the determination of bank asset quality on bank lending behavior in Ghana using a data from the Bank of Ghana for 25 Ghanaian banks from 2005 to 2010, the study employed a random effects (RE) model to test the relationship between bank lending behavior proxies as the ratio of loans and advances to total asset and bank asset quality (ratio of nonperforming loans to total loans and advances) while controlling for deposit mobilization, equity, management efficiency, intermediation costs and income diversification. They found that the decline of bank asset quality (high levels of non-performing loans) had effect on bank lending behavior and is persistence and not contemporary. Additionally, bank deposit mobilization, intermediation spread and equity were also found to affect bank lending behavior.

Djiogap and Ngomsi, (2012) analyzed the determinants of bank long-term lending behavior in the Central African Economic and Monetary Community using data from 35 commercial banks of six African countries of the CEMAC over the period 2001-2010 using a regression analysis. In this study they use two dependent variables: these are the ratio of bank long-term business loans to total assets and the second is the ratio of bank business loans to total assets. As explanatory variables they use: bank size, capital to asset ratio, long term liabilities, NPLs, ownership type, inflation and GDP growth.

Abdkarim et al., (2007) disclose that, monetary policy tightening instruments like interest rate in Malaysia reduces commercial banks lending to all the sectors of business. However, it is undoing in some sectors such as manufacturing and suggests that, lending interest rates are positively associated with Islamic financing and negatively associated with conventional loan**.** Usman, (1999) by examining a major regulations affecting commercial banks lending in Nigeria; he disclosed that, while central bank reduces the rate what the bank charges from borrower, banks become unwilling to provide loan to firms. Banks charge high interest premium for the borrowers who have higher credit defaulting risks repaying the loan (Ewert et al., 2000).Accordingly, the regression results show that bank size, GDP growth and capital to assets ratio are positive and statistically significant in both dependent variable analyses.

This indicates that larger and well capitalized banks are more willing to grant loans. The relationship between NPLs and the long-term loans to assets ratio is negative while there is no relationship between inflation rate and long-term loans ratio.

Olokoyo, (2011) on determinants of commercial banks lending behavior in Nigeria, he utilized explanatory variables such as volume of deposits, investment portfolio, interest rate, cash reserve requirement, liquidity ratio, foreign exchange and gross domestic product to determine their influence on commercial banks lending. The findings of the study revealed that all these explanatory variables do affect, in varying level of degree, the lending behavior of banks in the country. The study reveals that explanatory variables such as volume of deposit, investment portfolio, foreign exchange and gross domestic product in particular play significant role in influencing the lending behavior of deposit money banks in the country while cash reserve ratio was insignificantly affect the lending behavior.

Fan and hagiwara, (2003) have studied that, Changing Bank lending behavior and corporate financing in Asia, This study seeks to show a number of issues relating to bank lending and corporate finance. Numerous demand and supply side factors affect bank lending. On the supply side, reduced bank lending may come about because banks have insufficient capital for lending due to tight monetary policy and more stringent regulations such as stricter requirements on capital adequacy ratios. The accumulation of NPLs in Asia may be a particularly important factor hindering the banking system from performing its intermediary functions. An important demand side factor is the weakened status of borrower'sfinancial position. In a number of countries, the corporate sector has been struggling to deal with high debt burdens and overcapacity. Economic down turn can also cause demand for loans to decline, reflecting declines in new investment and increased excess capacity.

According, to YazanQudah, (2017) on their MSc thesis entitled''Determinants of Domestic Banks Lending Behavior Evidence of Jordan Eastern Mediterranean University,Gazimagusa, and North Cyprus". The results of regression showed that liquidity ratio, management quality, return on asset ratio, volume of deposits and inflation rate had positive and significant impact on banks' lending while credit risk, return on equity ratio and regional crisis had negative and significant impact on banks' lending also the result found that equity to asset ratio, bank size and global crisis had statistically insignificant impact on bank's lending. So the study suggested that banks should work better to receive more deposits and take caution in making decisions related to lending to avoid any default in bad loans.

Experience and skills management will affect directly on the banks' liquidity and profitability which lead to influence the bank's ability of lending.

According to Maurice OpiohKhangalah, (2016) on their MSc thesis entitled "Determinants of commercial banks' lending behavior in Kenya: case of state-owned banks in Kenya" he found that liquidity ratio and capital adequacy positively affected credit extension significantly whereas interest rate and asset quality inversely affected credit creation of the state-owned commercial banks. The effect of loan pricing (denominated in interest rate) on lending behavior was found to be statistically significant whereas asset quality was found to be statistically insignificant.

According to NeelamTimsina, (2016) in their research called "Determinants of Bank Lending in Nepal" the model used volume of deposits, interest rate, stipulated cash reserve requirements ratio, liquidity ratio, inflation, exchange rate, and gross domestic product as independent variables. He found that the GDP and liquidity ratio of banks have the greatest impacts on lending behavior. The study implies that GDP is the barometer of the economy and commercial banks should pay their attention to the overall macroeconomic situation of the country, factors affecting the GDP in general and their liquidity ratio in particular while taking the lending decisions.

2.19. Empirical Literature in Ethiopia

In Ethiopia, to the knowledge of the researcher, there are very limited work on the area of determinants of commercial banks lending and a few works on the impact of reducing or restricting loan disbursement on the performance of commercial banks. Thus, this particular section provides a review of the related studies conducted in Ethiopia.

According, to Ayitenew, (2016) in their research called "Determinants of Banks Lending Behavior in Ethiopia- Pragmatic Evidence from Commercial Banks"he measured bank loans and advances as outcome variable and bank-specific factors (liquidity ratio, volume of deposit, credit risk and bank capital) as internal explanatory variables, and monetary policy instruments (cash reserve requirement and lending rate) and macroeconomic factors (GDP and annual foreign exchange rate of birr to USD) as explanatory variables. The results show that except for liquidity ratio and the lending rate which are significant at a 5% level of significance, all bank-specific factors are significant at a 1% significant level. Thus, they influence the lending behavior of commercial banks in Ethiopia. On the other hand,

macroeconomic variables (GDP and an annual foreign exchange rate of birr to USD) and the cash reserve requirement ratio do not influence the lending behavior of Ethiopian commercial banks. Based on the result of the study, it has been suggested that Ethiopian commercial banks had better to give emphasis and employ different strategies so as to attract and seize deposits, establish applicable credit policies and arrangements and also critically consider the creditworthiness, rationing and performing ability of their debtors. Besides, they should focus to develop competent and proficient liquidity, credit risk and foreign exchange exposure management systems so as to reduce their negative energy on their lending performance.

According to Zelalem, (2017) on their MSc thesis entitled "The determinants of commercial bank's lending: Evidence from Ethiopia". In the study bank size, the volume of deposit, cash reserve requirement, credit risk, liquidity ratio, lending interest rate; GDP and inflation are the independent variables. The result shows that bank size, the volume of deposit and GDP growth positively affect Ethiopian commercial bank's lending behavior however, cash reserve requirement and liquidity ratio negatively affect Ethiopian commercial bank's lending behavior. On the other hand, credit risk, lending interest rate and inflation have an insignificant impact on Ethiopian commercial bank's lending or loan and advances. The study suggests that Ethiopian commercial banks should enhance their strategies in mobilizing deposits from the public and have to strive to strengthen their asset size. In addition, commercial banks should manage their liquidity and administer their lending activity by considering internal factors, existing economic situation, competitive environment, regulatory measures, and their target customers.

According toMalede, (2014) on their research entitled "The determinants of commercial bank's lending in Ethiopia." using panel data of eight commercial banks in the period from 2005 to 2011. He tested the relationship between commercial bank's lending and its some determinants (bank size, credit risk, gross domestic product, investment, deposit, interest rate, liquidity and cash reserve required). The result suggests that there is a positive and statistically significant relationship between commercial bank lending and its size, liquidity ratio, credit risk, and gross domestic product. But, there is a positive but insignificant relationship between commercial bank lending and deposit, investment, cash reserve required and interest rate for the study period. The study suggests that commercial banks have to give more emphasis to credit risk and liquidity ratio because it weakens bank's loan disbursement and leads a bank to be insolvent.

According to Amano (2014), on their MSc thesis entitled "The determinants of commercial banks lending behavior in Ethiopia" the estimation result shows that the volume of deposit and bank size had a positive and significant impact on loan and advance. The liquidity ratio and interest rate had a negative and significant impact on loan and advance. The cash reserve requirement and inflation rate had a positive and significant impact on loan and advance but the coefficient sign was not as expected. Finally, the real GDP growth rate had a statistically insignificant impact on bank's loans and advance. The study then suggests that commercial banks in Ethiopia should focus on mobilizing more deposits as this will improve their lending performance and should formulate critical, realistic and comprehensive strategic and financial plans.

2.20. Summary and knowledge gap

From the above theoretical and empirical literatures review, we can conclude that a strong banking system is the backbone for financial stability and development process of any country. As an intermediary of the financial system, banks channel scarce resources from the surplus economic units to the deficit economic units in the form of credit as such this activity forms part of their existence. This is why most of theresearchers discovered that lending is the major business activity for most commercial banks the loan portfolio is typically the largest asset and the biggest source of revenue. At the same time, it is one of the greatest sources of risk to a financial institution's safety and soundness.

Therefore, without having sufficient understanding on lending determinants of bank performance will be difficult. Most of the related studies indicate that the banks supply of loan is expressed as a function of internal and external determinants. The internal factors are termed as micro or bank-specific determinants of bank lending, whereas the external factors are macroeconomic factors that are not related to bank management but reflect the monetary, economic and legal environment that affect the operation of bank.

However, there are many empirical studies on the determinants of lending of commercial banks in developed economies; there have been only a few studies on the lending of commercial banks in developing economies like Ethiopia. In Ethiopia, the only empirical studies on this area are the research under taken by Malede, (2014), Aytenew, 2016), Amano (2014) and zelalem, (2017) which focuses on determinants of lending behavior of commercial banks in the country. These research papers focused in examining the lending determinants for commercial banks in the country including commercial bank of Ethiopia

with private banks which will bias the result of the study using some of the internal and external factors of lending determinants.

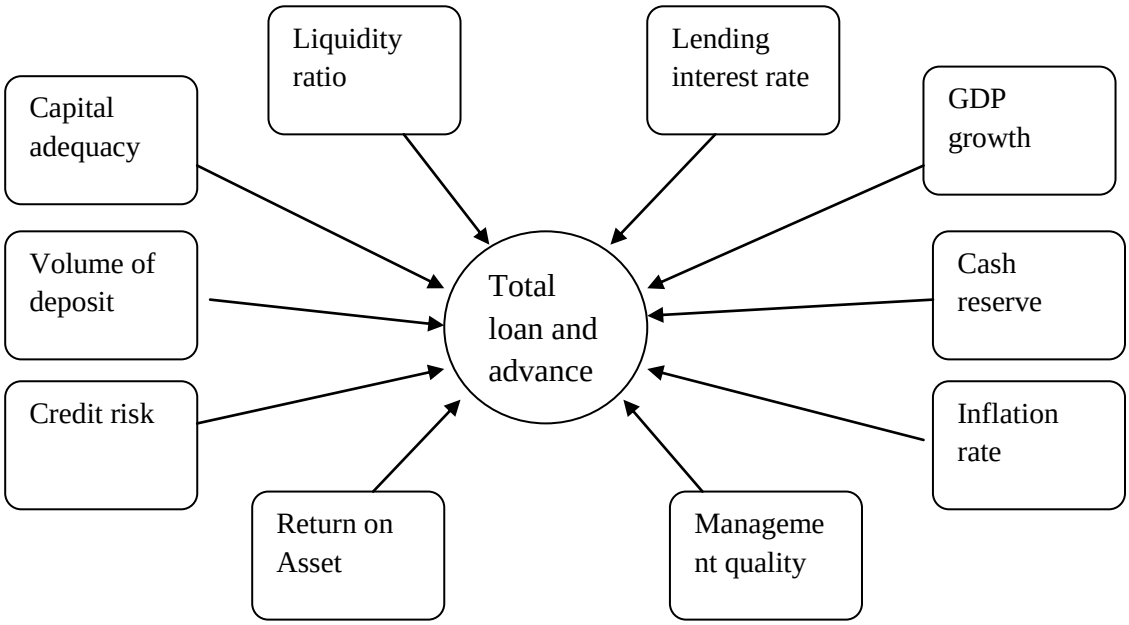
In Ethiopia, since the banking sector is in the growing process with opening of new private commercial banks and the absence of active capital market in the country, banks are the predominate providers of funds, and its stability has significant importance to the financial system and economy of the country. In accordance toAdedoyin and Sobodun (1996) lending is unquestionably the heart of banking business. Therefore, its administration requires substantialexpertise and handiness on the part of the banks management.

However, to the knowledge of the researcher except the research undertaken by Malede, (2014), Amano (2014),Aytenew, (2016) and Zelelem, (2017) there is no other empirical study on this area in Ethiopia. In their study all hadinvestigated determinants of lending behavior of commercial banks in Ethiopia by incorporating commercial bank of Ethiopia with the emerging private commercial banks which will lead to biased conclusion of the results. Besides, none of them studied the effect of management quality and return on asset of the on lending of commercial banks. Furthermore, there are inconsistencies of results among these researches which require a detailed investigation on this area by excluding the huge government commercial bank from the sample to avoid the bias of the result on private commercial banks. Therefore, the lack of sufficient consistent research on this area in the context of Ethiopia, endeavor to investigate lending determinant for private commercial banks separately by incorporating new variables like management quality and return on asset initiate researcher to study on this area. Hence, the objective of this study is to fill the knowledge gap of previous studies.

2.21. Conceptual Framework

Based on the theoretical and empirical propositions discussed above the conceptual relation and interaction of commercial banks lending or loan and advances can be framed as depicted below;

Figure 2.1Conceptual frame work of lending or loan and advances model



Source: *Own by reviewing and examining different literatures*

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1. Introduction

This chapter illustrates the study methodology highlighting the description of the study area, the research design, sampling method, the target population, sample size, research instruments, theoretical framework, and data analysis model derivation. This is where the conceptual framework was idealized into the study.

3.2. Research Design and Approach

According to Creswell, (2009) research design is a plan or proposal to conduct research. It involves the intersection of philosophy, strategies of inquiry and specific methods. This study employed is an explanatory type of research design. In addition, there are three types of research approach named qualitative, quantitative and mixed approach. As mentioned in Creswell, (2003) based on investigative study there are three common approaches to business and social research namely qualitative, quantitative and mixed methods approach. However, each approach has its own objective and application, in the selecting process one should take into account the nature of research problem or issues to be addressed, the researcher's personal experience and the audience for whom the report prepared. Therefore, in this study the quantitative research approach was used, since the data used were quantitative in nature.

3.3. Sample Design and Study population

3.3.1. Study population

As noted by Sekaran (2003), Population refers to the entire group of people, events or things of interest that the researcher wishes to investigate. A target population refers to the exact population on which information is preferred. According to National Bank of Ethiopian 2017/18 annual report there are seventeen commercial banks in Ethiopia including seventy-six years old state-owned commercial bank of Ethiopia. These are, Commercial Bank of Ethiopia (CBE), Awash Bank S.C, Dashen Bank S.C, Wegagen Bank S.C, Bank of Abyssinia S.C, United Bank S.C, Nib International Bank S.C, Cooperative Bank of Oromia S.C, Lion International Bank S.C, Berhan International Bank S.C , Buna International Bank S.C, Oromia International Bank S.C, Zemen Bank S.C, Addis International Bank S.C, Abay Bank S.C, Enat Bank S.C and Debub Global Bank S.C.

3.3.2. Sample Design

Sample design deals with sample frame, sample size and sampling techniques. Sampling is a technique of selecting a suitable sample for the purpose of determining parameters of the whole population. Population is the list of elements from which the sample may be drawn (Admas et al., 2007). A sample is drawn to overcome the constraints of covering the entire population with the intent of generalizing the findings to the entire population. The study population for this study includes all private commercial banks in Ethiopia. As stated in NBE 2017/18 annual reports there are 17 Commercial Banks (16 private and 1 public) in the country excluding the Development Bank of Ethiopia which provides banking service to the selected priority sectors by government. The sample drawn in this study is from those private commercial banks having at least ten years working experience (from 2009 to 2018).The criteria set by the researcher for selecting the sample was; first, the required banks are only private Commercial banks operating in Ethiopia. Second, those private commercial banks should have started operation before 2009 G.C, so that the data is available for consecutive ten years from 2009 to 2018 G.C. The reason of making the sample period of ten year is to increase the number of observation by incorporating more commercial banks. Here, commercial bank of Ethiopia is excluded since it is public and huge that is incomparable with private commercial banks to avoid bias of the result. Therefore, from 16 private commercial banks operating in the country the study takes sample of ten private commercial banks of which audited financial statements are available within the study period identified: These are, Awash International Bank S.C (AIB), Dashen Bank S.C (DB), Bank of Abyssinia S.C (BOA), Wegagen Bank S.C(WB),United BankS.C (UB), Nib International Bank S.C (NIB), Cooperative Bank of Oromia S.C (CBO) and Lion International Bank S.C (LIB), Oromia International Bank S.C(OIB), Zemen Bank S.C (ZB).Therefore, the matrix for the frame is 10*10 that includes 100 observations. According to Kothari, (2004), good sample design must be viable in the context of time and funds available for the study. Accordingly, this study employed purposive sampling technique to draw the required sample of banks from the above listed banks since they have audited financial statements data for the required sample period and viable in line with time and funds available for this study.

3.4. Data Type, Sources and Collections

As noted in Gujarati (2009) there are three types of data available for empirical analysis. These are; time series, cross-section, and panel or pooled (i.e., a dimension of both time series and cross section) data. The nature of data used in this study is balanced panel data type.As panel data has the combination of both cross-sectional and time-series it is more useful as it captures individual variability (cross-sectional information), and captures dynamic natures of the data (time-series information). And it ensures more variability, more degrees of freedom, more efficiency, and less co linearity among variables (Gujarati, 2009).
As noted in Baltagi (2005), the advantage of using panel data is that it controls for individual heterogeneity, less co linearity among variables and tracks trends in the data which simple time-series and cross-sectional data cannot provide. Besides, by combining time-series and cross-section observations, it gives more informative data.

However, both have their own strength and limitations there are two sources of data namely: primary and secondary sources (Johnand Clark, 2006). The reliability and validity of the secondary data highly depend on the source of the information. Source of data from large well known organization and survey data's from government organizations are highly likely to be reliable (Sunders et al., 2012). To achieve the objective of this study, secondary data was collected for ten private commercial banks for the sample period of ten years from 2009 to 2018 G.C. The secondary data collection constitutes an extensive survey of different sources including, Audited financial statements, official documents, websites, and annual reports basically from the National Bank of Ethiopia (NBE) for internal factors and Ministry of Finance and Economic Cooperation (MoFEC) for macroeconomic factors.Consistent and reliable research indicates that research conducted by using appropriate data collection instruments increases the credibility and value of the research findings.

3.5. Data analysis and presentation

After the required data is all collected, the next work is to analyze the collected data to achieve the stated objective of the study. The collected secondary panel data was analyzed using descriptive statistics, correlations, and multiplelinear regression analysis. Descriptive statistics was used to analyze the general trends of the data from 2009-2018 based on the sample of ten private commercial banks.

The correlation matrix was used to examine the relationship between the dependent variables and explanatory variables. According to, Brooks (2014) regression is concerned with describing and evaluating the relationship between a given variable (called the dependent variable) and other variables (known as the explanatory variables). A multiple regression model was used to determine the relative importance of each independent variable in influencing the lending of private commercial banks.

Finally, the Ordinary Least Square (OLS) regression approach including all of its assumptions was conducted using STATA11 econometric software package, to test the causal relationship between the private commercial bank's lending and their potential determinants. As noted in Brooks (2014) there are assumptions required to confirm that the ordinary least square (OLS) estimation technique and hypothesis tests concerning the coefficient estimates could genuinely be conducted. If these Classical Linear Regression Model (CLRM) assumptions hold, then the estimators determined by OLS have a number of desirable properties and are known as Best Linear Unbiased Estimators (BLUE). Accordingly, diagnostic tests were performed to test whether the assumptions of the CLRM are violated or not in the model.

According to Brooks (2014), the assumptions of ordinary least squares are:

I. The errors have zero mean (E (ut) = 0)

II. Variance of the errors is constant (Var (ut) = $\sigma 2 < \infty$)

III. Covariance between the error terms over time is zero (cov (ui, uj) = 0 for $i \neq j$

IV. Test for Normality (ut,N(0, $\sigma 2$)

V. Multicollinearity Test

If all the above assumptions are consistent with the sample, STATA result will be accurate and reliable.

Test for average value of the error term is zero (E (ut) =0)

The econometric estimation technique that is used by this study is ordinary least square (OLS).This assumption is not violated as the regression line did not force to pass through the origin. This assumption is violated if the models do not have constant term since the line will be forced to pass through the origin (Brooks, 2014).

Test for Homoscedasticity assumption (Var(ut) =σ2)

The variance of the errors should be constant. This assumption is called homoscedasticity assumption. If the errors do not have a constant variance, they are said to be heteroscedastic. The researcher is used white test to test heteroscedasticity. In this test the null hypothesis is that there is no evidence for the presence of heteroscedasticity (homoscedasticity does exist) and the alternate hypothesis is that there is evidence for the existence of heteroscedasticity. Therefore, if this hypothesis is rejected it is said to be the variance of the errors are no longer constant or the assumption of homoscedasticity is violated, on the other hand there is evidence for the existence of heteroscedasticity (Brooks, 2008).

Test for absence of autocorrelation (cov (ui,uj)=0 for i= j)

Covariance between the errors term overtime is zero. It is assumed that the errors are uncorrelated with one another. If the errors are not uncorrelated with one another, it would be stated that they are auto correlated or that they are serially correlated (Brooks, 2008). The study was used both Durbin-Watson test (DW test) and Breusch-Godfrey Serial Correlation LM test to test autocorrelation. The null hypothesis for this test is there is no autocorrelation and the alternative hypothesis is that there is evidence for the presence of autocorrelation. Therefore if the null hypothesis is rejected then it is said that there is an evidence for the presence of autocorrelation.

Test for Normality assumption (Ut~N (0, σ2)

The study uses BeraJarque (BJ) normality test for non-normality. From the result the study uses the value of kurtosis and p-value to identify whether normality exists or not. The null hypothesis is that the distribution is normal and the alternate hypothesis is that the distribution is not normally distributed. Therefore if the null hypothesis is rejected then the distribution is not normally distributed. The researcher had also used kurtosis value to test for non-normality and from the literature the normal distribution had a kurtosis value of 3. A normal distribution is not skewed and is defined to have a coefficient of kurtosis of 3(Brooks, 2008). For the residuals to be normal jarquebera value should not be significant.

Test for Absence of Multicollinearity

Multicollinearity in the regression model suggests substantial correlations among independent variables. This phenomenon introduces a problem because the estimates of the sample parameters become inefficient and entail large standard errors, which makes the coefficient values and signs unreliable. In addition, multiple independent variables with high correlation add no additional information to the model. It also conceals the real impact of each variable on the dependent variable (Brooks, 2008).

3.6. Model selection (Fixed Effect and Random Effect models)

According to, Gujarati, (2009) has noted that as a formal test, Hausman test can be used to select between fixed effect model (FEM) and random effect model (REM) for panel data analysis. As to Gujarati, (2009), the null hypothesis underlying the Housman test is that the FEM and REM estimators do not differ substantially. Moreover, Gujarati, (2009), indicates if T (the number of time series data) is large and N (the number of cross-sectional units) is small, there is likely to be little difference in the values of the parameters estimated by fixed effect model (FEM) and random effect model (REM).

3.7. Model Specification

In respect of the hypotheses stated, the main issue is an investigation of relationship between the lending commercial banks and its determinant variables that had been identified through literature and theories reviewed i.e. Bank size, Deposit ratio, liquidity ratio, Credit risk, lending interest rate, cash reserve, management quality, GDP growth, exchange rate and inflation. Other determinant factors that are not explicitly included in this model were captured by the error term in the model.

As noted in Brooks (2014), a panel data will embody information across both time and space and it measures some quantity about them over time. The advantage of using panel data is to address a broader range of issues and tackle more complex problems than would be possible with pure time series or pure cross-sectional data alone. Panel data has also advantage of giving more informative data as it consists of both the cross-sectional information which captures individual variability and the time series information that captures dynamic adjustments (Brooks, 2014).

Accordingly, to test the determinant factors on lending of private commercial banks, the researcher estimated a linear regression model in the following form.

TLA = f (CAR, VD, CR,LQr, LIR, MQ,CRr, GDP, INF, ROA)……..……. (1)

Equation:

LogTLAit = f (α0+ β1CARit β2VDit, β3CRit, β4LQrit, β5LIRit, β6MQit, β7CRrit, β8GDPit, β9INFit, β10ROAit, + μit) ……..…….…. (2)

Source: developed by researcher

Where:

LogTLAit: Natural logarithm of Total Loan and advance of bank i at time t.

CARit:Capital Adequacy of bank i at time t.

VDit: Deposit ratio of bank i at time t.

CRit: credit risk of bank i at time t.

LQrit: Liquidity ratio of bank i at time t.

LIRit: Interest Rate (Lending Rate) of bank i at time t.

MQit: management quality of bank I at time t.

CRrit: Cash reserve required of bank i at time t.

GDPit: gross domestic product at time t.

INFit: Inflation rate at time t.

ROAit: Return on Asset of bank i at time t.

μit: is the error term for bank i at time t assumed to have mean zero.

α0:is the intercept or constant of the regression line.

From β1 to β10: are parameters or coefficients of the independent variables estimated.

According to Brooks (2014), Model specification error occurs when omitting relevant independent variables, including unnecessary variable or choosing the wrong functional form, so that regression model will be wrongly predicted. If the omitted variable is correlated with the included variable, the estimators are biased and inconsistent. If the omitted variable is not correlated with the included variable, the estimators are unbiased and consistent. Ramsey RESET test was used to see whether the developed model is correctly fit the regression.

The hypothesis for the Ramsey RESET test was formulated as below:

H0: the model is correctly specified

H1: the model is not correctly specified

$\alpha = 0.05$

Decision Rule: Reject H0 if p-value is greater than significance level. Otherwise, do not

3.8. Description and measurements of variables

3.8.1. Total Loan and Advance (Dependent variable):

The focus of this study was on estimating private commercial banks lending. Commercial banks usually extend money to their customers in the form of loan. The total lending which banks provide for their customer was measured by taking numerical data from the sampled private banks and NBE.

3.8.2. Independent (Explanatory) variables

Capital adequacy , the volume of deposit, cash reserve requirement ratio, credit risk, liquidity ratio, lending interest rate, gross domestic product, management quality, return on asset, and inflation are used as explanatory variables.

Capital Adequacy

Capital adequacy is the capital amount that banks are required to hold to withstand credit, market and operational risks they will be exposed to. It is used to absorb the potential losses resulted from their day to day activities and protect the bank's debtors. This is a critical factor in the sense that capital itself is the amount of the banks own fund available to support the bank's business at all times and it also serves or acts as a buffer in strained situations. Therefore, bank’s capital creates liquidity for the bank due to the fact that they cannot merely rely on deposit as they are most fragile and prone to bank runs. Capital adequacy is measured on the basis of capital adequacy ratio (CAR), which demonstrates the internal strength of the

bank to carry losses when calamity strikes.As Bouvatier and Lepetit (2007) and Djiogap and Ngomsi (2012) finding indicates that poorly capitalized commercial banks are constrained to expand credit to the clients. Bank capitalization is measured by the ratio of paid-up capital to total assets of the banks.

To proxy capital adequacy paid up capital of bank to total assetsratio was used.

H1. Capital adequacy has a positive and significant impact on commercial banks lending.

Volume of Deposit

Deposits from the majority of banks liabilities and play an important role in the intermediation activities of banks. The decisions of banks management to lend are greatly influenced by the volume and cost of deposits to the banks. A positive relationship is thus expected between the volume of deposits and bank lending decisions. The deposits ratio is measured as the ratio of customer deposits to banks total liabilities.Volume of deposit had positive but insignificant effect on bank's lending Malede, (2014) but Volume of deposit are significant factors at 1% significant level volume of deposits had positive and significant impact on bank's lendingOlokoyo, (2011) AyitenewTemesgen (2016); Zelalem, (2016); YazanQudah, (2017)

T**o proxy the effect of deposit total customer deposit to total asset ratio was used.**

H2. Volume of deposit has a positive and significant impact on commercial banks lending.

Cash reserve

Amano, (2014) states that reserve requirements are considered to be a powerful tool for the government to control the activities of commercial banks. The reserve requirement (or cash reserve ratio) is a central bank regulation that sets the minimum reserves each commercial bank must hold (rather than lend out) of customer deposits and notes. It is Cash stored in the form of the physical object in a bank vault or deposits set with a central bank.

The required ratio reserve is sometimes used as a tool in monetary policy for influencing the borrowing and interest rates of the country by changing the number of funds available for banks to make loans. Cash reserve requirement had positive and significant impact on loanAmano (2014) Cash reserve requirement had negative and statistically significant effect on bank's lending Berhanu, (2016)); cash reserve requirement ratio does not influence the

lending behavior of Ethiopian commercial banks Malede, (2014); Zelalem, (2016); AyitenewTemesgen (2016).

To proxy cash reserve effect annual cash reserve requirement rate is used.

H3. Cash reserve requirement has negative and significant impact on commercial banks lending.

Credit risk or Asset Quality

Credit risk is defined as the failure of the borrowers to serve their debt under the schedule and agreements of the commercial banks. According to Chijoriga, (1997), Malede, (2014) credit risk is a serious risk in financial institutions and it has a sophisticated effect as compared to other risks as it directly threatens the solvency of financial institutionscredit riskhad negative and significant impact on bank's lendinginversely

To proxy credit risk, a ratio of nonperforming loans to total loans and advances was used.

H4. Credit risk has a negative and significant impact on commercial banks lending.

Liquidity ratio

Liquidity for a bank is the capability of banks to meet their financial obligations. Banks should be considering on adequate liquidity. Commercial banks are careful in their assets liability management to become liquid. Liquidity is the base of confidence in the financial business and it has great implications on analyzing bank lending decisions towards government monetary policy response. There will be expected either a positive or negative relationship between bank liquidity and bank lending decision.

Liquidity ratio had negative and significant impact on loan and advance. Amano, (2014); Zelalem, (2016) inversely Liquidity ratio had positive and statistically significant effect on bank's lending Malede, (2014); NeelamTimsina, (2015), Maurice OpiohKhangalah, (2016); YazanQudah, (2017).

To proxy liquidity ratio total current asset to current liability was used.

H5. Liquidity ratio has a positive and significant impact on commercial banks lending.

Lending Interest rate

The lending rate is the amount of bank rate that usually meets the short term and medium-term financing demand of the private investment sector. This rate is differentiated based on the creditworthiness of borrowers and the objectives of the financing sectors. Lending interest rates is one of strong independent variable affecting commercial bank's loan and advances. As a result, the direct interest rate did not impact commercial banks' loan supply negatively. Interest rate had negative and significant impact on loan and advance Amano, (2014), Maurice OpiohKhangalah, (2016) inversely interest rate had insignificant impact on loan Malede, (2014) and AyitenewTemesgen (2016).

To proxy the interest rate effect annual average lending interest rate is used.

*H6. Lending interest rate has a negative and insignificant impact on commercial banks lending***.**

Gross Domestic Product (GDP)

Gross Domestic Product (GDP) is the total monetary value of all the finished produced goods and services within a country's in a specific measure of time. The measure of the total economic activity within the border of every economy and used as a strong economic indicator. According to, (Flamini*et al.,* 2009) GDP growth is used to control cyclical output effect which, it assumes, has a positive influence on bank lending. However, when the GDPgrowth slows down, particularly during recessions, credit quality deteriorates, and default increases thus, reducing subsequent bank lending.Real GDP growth rate had statistically insignificant impact on bank's loanAmano (2014); AyitenewTemesgen (2016). Inversely GDP had positive and statistically significant effect on banks' lending Zelalem, (2016); NeelamTimsina, (2015); Malede, (2014).

To proxy GDP effect annual real GDP growth rate was used

*H7. Gross domestic product growth has a positive and insignificant impact on commercial banks lending***.**

Inflation

As inflation risesover some point, it results in a decline in bank lending. A few economists have established that countries with high inflation rate have unproductive banking sectors.

This adverse suggests that inflation reduces bank's lending to the private sector, which is consistent with the view that a sufficiently high rate of inflation induces banks to ration credit. It has been suggested that the credit amount that universal banks extend to their clients reduces as inflation rises (TayeKidane, 2019).

Inflation is defined as the continuous increases in the price level of goods and services in specific economy over a period of time. When the price increases the purchasing power of money also declines. Inflation was calculated on the nominal for short-run price impact and real for long-run price impact.Inflation rate had positive and significant impact on loan Amano, (2014), zelalem, (2017) and Ayman Mansour, (2017). However, Naceur (2009), Banm et al., (2005) and Olaiyan, (2000) find the negative relationship between inflation and loans and advances.

To proxy inflation effect annual inflation rises rate was used

H8. Inflation rate rise has a negative and significant impact on commercial banks lending.

Return on Assets

Profitability of banks can be measured by return on its asset ratio and return on its equity ratio. These measures provide evidence on the performance of banks. More profit generating commercial banks can assist more credit to its customers. Laidroo, (2012) investigated the determinants of lending growth of banks in 15 central eastern European countries for the period 2004-2010. The study found that there is significant and positive impact between profitability of bank and lending. BerlinandMester, (1998) analyzed the relationship between profitability and lending by using panel data of 126 banks. The study found that banks profitability has positive and significant impact on its lending. In another study Gunji and Yuan (2010), investigated the how banks profitability affect lending in China during the period 1985 – 2007. The result showed positive and significant influence between bank profitability and lending for the Chinese banking sector.Aymanmansour, (2017) investigated factors may drive commercial banks lending in Jordan by using panel data of thirteen banks for the year 2010-2016 and found that return on asset of the banks has a positive and significant impact on lending of commercial banks

To proxy return on asset effect net income to total asset ratio of the bank was used.

H9. Return on asset has a positive and significant impact on lending of private commercial banks.

Management quality

Management quality ratio is a determination of quality policy and its implementation, by use of significant plan and good management for the liquidity which impact the bank performance, and the ability to lend. The measurement used is total operating expenses to total operating income and the expected sign is positive, because when the expenses increase banks lend more to cover it.The qualities of any managers are achieving and hit the target of the company especially bank's management is measured on gaining high profit from the low-cost operation. Highly qualified management staff in the banks assumed to have good initiations to appreciate the lending and control all activities and tasks needed to maintain an expected result.YazanQudah, (2017) management qualityhad positive and significant impact on bank's lending.

To proxy management quality operating expense to operating income ratio was used.

H10. Management quality has positive and significant impact on privatecommercial banks lending.

3.9. Operational form of variables

Table 3.1: Description of variables

Variables	Variable description	Used by	Symbol	Expected sign
Dependent variables				
Total Loan and Advances	Log of Total Loans and Advances	Olokoyo, (2011), Amano. (2014), MHalede, (2014)	TLA	
Explanatory variables				
Capital Adequacy ratio	Paid up Capital/ total assets	Djiogap and Ngomsi (2012) &Imran and Nishat (2012)	CAR	Positive
Volume of Deposit	The ratio of customer deposit to total assets	Ajayi (2007), Mitku (2014) &Ojo (1978)	VD	Positive
Cash Reserve Requirement	Annual cash reserve requirement rate	Christian & Pascal (2012), &Montro& Moreno (2011	CRR	Negative
Credit risk	A ratio of nonperforming loan /Total loan and Advances	Alhassan et al. (2013 Rabab'ah (2015), &Tomak (2013),	CR	Negative
Liquidity Ratio	The ratio of Current Asset to Current Liabilities	Ituwe, (1985) and maled, (2014)	LR	Positive
Lending Interest Rate	Annual average lending interest rate	Bernanke and Blinder,(1988) and Amano, (2014)	LIR	Negative
GDP growth	The yearly real GDP growth rate	Dietrich and Wanzenried (2011) &Mitku (2014	GDP	Positive
Inflation	Annual inflation growth rate	Naceur (2009), Banm et al.(2005)&Olaiyan (2000)	INF	Negative
Return on Asset	Net Income /Total Asset	Aymanmansour, (2017), Yazankudah, (2017), Obamuyi,(2013)	ROA	Positive
Management quality	Operating expense/operating income	Yazankudah, (2017)	MQ	Positive

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

Under this chapter, the data and its analysis results such as descriptive statics, correlation and regression analysis output were presented and interpreted. This chapter has five parts. The first part (part 4.1.) presents the descriptive statistics of the dependent and independent variables. This was followed with part4.2 that presents output of the correlation analysis. Part 4.3 presents the test for the assumptions of OLS regression model. Part 4.4 discusses for model specification. Part 4.5 finally, discussions of the results of the regression Analyses were made.

4.1. Descriptive statistics

Table 4.1 presents summary of the descriptive statistics of the dependent and explanatory variables for ten private Commercial Banks from the year 2009 to 2018 G.C with a total of 100 observations. The table shows the mean, minimum, maximum, standard deviation and number of observations for the dependent variable Total Loans &Advances (TLA) and explanatory variables, Volume of Deposit (VD), Nonperforming Loans (NPL), liquidity (LQr), Cash Reserve Requirement (CRr), Capital Adequacy Ratio (CAR), Lending interest rate (LIR), Inflation (INF), Return on Asset (ROA), Management Quality(MQ) and Gross Domestic Product (GDP).

Table 4.1 Descriptive statistics of the dependent and explanatory variables.

```
. summ tla car vd cr lqr lir mq crr gdp infr roa
```

Variable	Obs	Mean	Std. Dev.	Min	Max
tla	100	9.460743	.693453	8.053	10.904
car	100	.09051	.043435	.037	.377
vd	100	.76552	.0522794	.573	.863
cr	100	.02428	.0171418	.003	.098
lqr	100	1.07047	.1849679	.437	1.451
lir	100	.1194	.0117413	.07	.147
mq	100	1.14137	.6753022	.353	3.569
crr	100	.085	.0452267	.05	.15
gdp	100	.0971	.0113391	.077	.114
infr	100	.1278	.0978638	.027	.38
roa	100	2.9156	1.317839	-3.95	6.72

Source: Audited Financial statements of banks, MoF reports and own computation through STATA 11.

Table 4.1 describes the average indicators of variables computed from the audited financial statements of sampled commercial banks collected from NBE reports and the standard deviation of the variables indicates how much dispersion exists from the mean value. According to Brooks, (2008), a small standard deviation show that the data point is tend to be

very close to the mean value, whereas high standard deviation indicates the data point are dispersed out over a large range of values.

As shown in the above table all variables comprised 100 observations. The dependent variable is total loans and advances (TLA). The other variables are the explanatory variables. The average value of the dependent variable total loan and advances was 9.46 with a standard deviation value of 0.69%. The standard deviations of 0.69% indicate lower dispersion of dependent variable from its mean for the private commercial banks in Ethiopia. The maximum and the minimum value of the dependent variable are 10.90 and 8.05 respectively.

As far as explanatory variables concerned, the average value of VD was 76.50% which indicates that on average customers deposit (i.e. saving deposit, demand deposit and fixed deposit) accounts 76.50% from the total assets of private commercial banks. Its maximum value 86.3% and minimum value 57.3% shows that there was a significant variation on the level of deposit within the sample period of this study (i.e. from 2009-2018).

The mean of CR was 2.42% with a minimum of 0.3 % and a maximum of 9.8%. This indicates, from the total loans and advances that private commercial banks extended, an average of 2.42% were uncollected or not served over the sample period indicated. The lowest CR ratio that private commercial banks experienced within the given sample period was 0.3 %. The variation between the minimum 0.3 % and the maximum 9.8% of credit risk ratioshows the margin that non-performing loan ratio of private commercial banks ranged within the sample period. The reason for the declining of the defaulted loan ratio is that the directive issued by regulatory body (i.e. NBE) that obliged all commercial banks in Ethiopia to keep their non-performing loan ratio below 5%. Moreover, commercial banks might have improve their follow-up system to reduce the amount of defaulting loans to keep the ratio under the maximum threshold put by NBE as per Directive № (NBE, 2008).The standard deviation of 1.71% of CR ratio from its mean value indicates the existence of difference among commercial banks in terms of their loan collecting capacity even though they has kept the default ratio below 5%level.

Furthermore, the result of the descriptive statistics indicates that, the ratio of currentassets was 107.04% on average, with a minimum of 43.70 % and a maximum of 145.1 %. The liquidity measure indicates that the Ethiopian commercial banks have, on average, a higher

liquidity position which was higher than the statutory requirement of 15% NBE Directive № SBB/57/2014.On the other side, the standard deviation of liquidityratio was 18.49% which shows the highest deviation from its average value when compared to other variables. This indicates that there was a highest difference among private commercial banks liquidity in Ethiopia within the sample period.

The mean value of capital adequacy ratio was 9% with a maximum of 37.7%.The average capital adequacy ratio surpassed the minimum ratio of 8% set by NBE on Directives № SBB/50/2011. This can indicate existence of sound financial condition in Ethiopian commercial banks. The standard deviation statistics for capital strength was 4.3% which show the existence of variation of equity to asset ratio among the private commercial banks in Ethiopia during the sample period.

The average lending interest rate of private commercial banks was 11.94%; with standard deviation of 1.17% which is the second smallest variation from the existing independent variables in the study. It indicates that the average lending interest rate of commercial banks was stable over the sample period.

The mean value of private commercial banks management quality was 114%; with standard deviation of 67% which is thelargest variation from the existing independent variables in the study. It indicates that the non-interest operating income to non-interest expense ratio of commercial banks was unstable over the sample period. It has the minimum and maximum value of 35% to 350% dispersion.Here, the high ratio indicates the efficiency of managements in controlling the expenses.

The return on assets indicates that the minimum return was -3.91 while the maximum is 6.7. The mean value of return on asset of private commercial banks was 2.91, which indicate that private commercial banks were earning average return of 2.91 on their asset during sample period under study. On the other side, the average valueof cash reserve rate was 8.5% having maximum and minimum value of 15% and 5 % respectively. Its standard deviation was 4.522%.

Among, the macroeconomic variables used in this study inflation had a higher deviation which of 9.7%. This indicates that inflation rate in the country during the study period remains changing. GDP On the other side, which is real GDP growth in Ethiopia for the last

tenyears,was 9.7%, with a standard deviation of 1.13% showing that the economic growth in the country during the study period remains stable as compared to the rising inflation rate.

4.2. Correlation Analysis of the Variables

Table 4.2: Correlation Analysis of dependent and independent variables

```
corre tla car vd cr lqr lir mq crr gdp infr roa
(obs=100)

             |      tla      car       vd       cr      lqr      lir       mq      crr      gdp     infr      roa
-------------+---------------------------------------------------------------------------------------------------
         tla |   1.0000
         car |  -0.4391   1.0000
          vd |   0.7347  -0.3791   1.0000
          cr |  -0.6788   0.7900  -0.4622   1.0000
         lqr |   0.6094  -0.7385   0.4171  -0.7450   1.0000
         lir |   0.5315  -0.1945   0.4590  -0.3478   0.3232   1.0000
          mq |   0.2120   0.2768   0.2678   0.0315  -0.0625   0.3465   1.0000
         crr |  -0.7506   0.2829  -0.6458   0.5833  -0.5848  -0.5250  -0.2614   1.0000
         gdp |  -0.4930   0.1323  -0.3991   0.3133  -0.3487  -0.3963  -0.3437   0.4658   1.0000
        infr |  -0.0863  -0.1273  -0.0298  -0.0241  -0.0300   0.0419  -0.2797   0.3120   0.1891   1.0000
         roa |   0.7190  -0.7931   0.5407  -0.7206   0.8069   0.4534   0.0122  -0.5580  -0.3571   0.0677   1.0000
```

Source: Source: Audited Financial statements of sampled banks, MoF reports and own computation through STATA 11.

Correlation analysis measures the degree of linear association between variables. The values of correlation coefficients are always fall between -1 and +1. A correlation coefficient of +1 tells us there is perfect positive association between the two variables; however a correlation coefficient of -1 tells us a perfect negative association. A correlation coefficient of zero, on the other side indicates the there is no relationship (association) between two variables (Brook, 2014). The sample size is the key point to determine whether or not the correlation coefficient is different from zero/statistically significant. As a sample size approaches to 100, the correlation coefficient of about or above 0.20 is significant at 5% level of significance (Meyers et al. 2006). The sample size of the study was 10*10 matrixes of 100 observations which was 100 hence the study used the above justification for significance of the correlation coefficient. Table 4.2 above shows the correlation coefficient between the dependent variables and independent variables.

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

In this study as noted in chapter three diagnostic tests were carried out to ensure that the data fits the basic assumptions of classical linear regression model. Consequently, the results for the assumptions of model are presented below:

4.3.1. Test for average value of the error term is zero (E (ut) =0) assumption

As noted in Brooks (2014), if a constant term is included in the regression equation model; this assumption will never be violated. Thus, since the regression model used in this study includes a constant term, this assumption is not violating.

4.3.2. Test for Heteroscedasticity {E (ui2) = σi2}

The assumption required for the OLS estimator to be an effective state that, the variance of the residuals has to be constant and the same for all observers. This is referred to as a homoscedastic error term. When this assumption is violated and the variance is differed for different observation it is referred as Heteroscedasticity, if the assumption of constant variance is violated, the standard errors could be wrong and since any inferences made could be misled. Generally, the OLS standard errors will be too large for the constant when the errors are heteroscedastic. In order to test the following hypothesis Breusch-pagan/ cook-Weisberg test for heteroscedasticity was applied.

The hypothesis for the heteroscedasticity test was formulated as bellow;

H0: The variance of the error term is homoscedastic

H1: The variance of the error term is heteroscedastic

Decision Rule: Reject H0 if P -value is less than significant level of 0.05. Otherwise, do not reject.

Table 4.3 Heteroscedasticity Test

```
. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of tla

         chi2(1)      =     0.59
         Prob > chi2  =   0.4414
```

As shown in table 4.3, there was no evidence for the presence ofheteroscedasticity, hence the p-value is in excess of 5 percent level of significance, and so the hypothesis does not rejected. This shows that there is no significant evidence for the existence of heteroscedasticity at 5%.

4.3.3 Test for Autocorrelation {cov (ui, u j) = 0 for i ≠ j)}

According to (Brooks, 2008), third assumption of the CLRM said that disturbances of the error terms of and covariance between the error terms over time (or cross-sectional, for that type of data) should be equal to Zero. In other words, it is assumed that the errors terms were uncorrelated with one another. If the errors are not uncorrelated with one another, it would be stated that they are "Auto correlated" or that they are said to be "serially correlated". This study used Durbin Watson test to check for the existence of autocorrelation among the error terms.

Table 4.4 Durbin Watson Test for Serial Correlation

```
 tsset time
        time variable:  time, 1 to 100
                delta:  1 unit

. estat dwatson

Durbin-Watson d-statistic( 11,   100) =  1.3936198
```

The Durbin-Watson statistic ranges in value from 0 to 4. A value near 2 indicates non autocorrelation, a value toward 0 indicates positive autocorrelation; a value toward 4 indicates negative autocorrelation (Hair et al. 1998). Having 100 observations with ten independent variables the result of DW test as shown in table 4.4 above was 1.39 which is closer to 2 indicated that the null hypothesis cannot be rejected. Therefore, there was no evidence of autocorrelation among error terms in this study.

4.3.4. Normality test (errors are normally distributed {ut~N (0, σ2)}

In accordance to Brooks (2014), when the residuals are distributed normally, the histogram should be bell-shaped, and distribution will have a coefficient of excess kurtosis of zero. One of the known applied tests to check for normality is the Bera-Jarque (BJ) test. When the p-value of the normality test is greater than 5 percent accept the null hypothesis that indicates the data is normally distributed.

The hypothesis for the normality test was formulated as follow:

H0: the data is normally distributedH1: the data is not normally distributed

Decision Rule: Reject H0 if p-value of JB is less than significance level. Otherwise, do not reject.

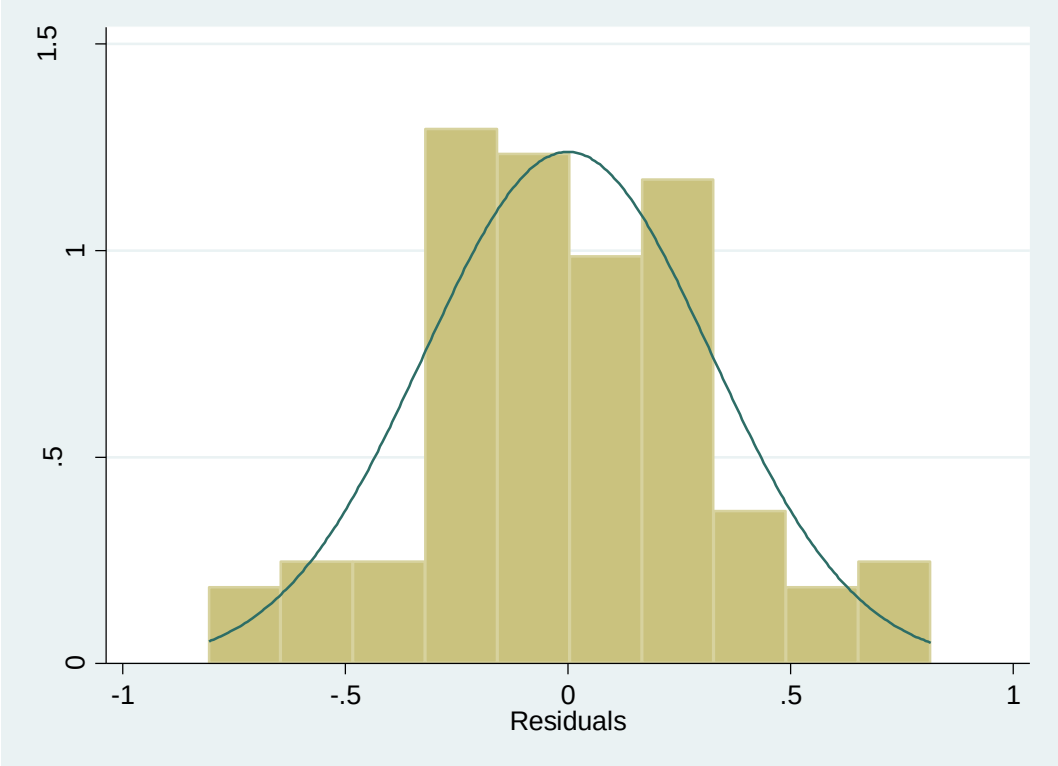
```
. sktest resid
```

Skewness/Kurtosis tests for Normality

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	joint adj chi2(2)	joint Prob>chi2
resid	100	0.7025	0.6079	0.41	0.8130

Figure 4.1Normality test

```
. hist resid
(bin=10, start=-.80678272, width=.16217226)
```



Source: STATA 11 output

Figure 4.1 Indicates that the distribution of the panel data observation is symmetric about its mean value.

As shown in the above figure 4.1 the sktest statistic has a P-value of 0.8130 which is greater than 0.05. This indicates that there was no evidence for the existence of an abnormality in the data observed. Thus, the null hypothesis that the data is normally distributed should not be rejected since the p-value was in excess of 5 percent significance level. Moreover, it describes that the inferences made regarding the population parameters from the taken sample parameters are tend to be valid.

4.3.5. Multi-collinearity Test result

Multicollinearity shows a linear relationship among explanatory variables which may results in the regression model to be biased (Gujarati, 2004). If one explanatory variable is an exact linear combination of the other explanatory variables, then it said the model suffers from perfect collinearity, and it cannot be estimated by OLS (Brooks, 2008). When explanatory variables have multi collinearity, there is overlap or sharing of estimating power. This may results in paradoxical effect, whereby the regression model fits the data well, but none of the explanatory variables (individually) has a significant impact in estimating the dependent variable (Gujarati, 2004). . If the results showed that the variance of inflation factor VIF is more than 10, the regression results would be affected by a multicollinearity problem (Gujarati 2004).

According to Lewis-Beck (1993) suggestion to find out the multi collinearity problem, the bivariate correlations between the explanatory variables should be examined and the correlation of about 0.8 or larger shows a problem of multi-co linearity. Also, Cooper and Schendlar, (2003) suggested that a correlation above 0.8 should be corrected. As stated by Hair et al. (2006) correlation coefficients below 0.9 may not cause serious multicollinearity problem. In addition to this the variance of inflation factor (VIF) was used to test for the existence of this problem.

Table 4.5 Correlations matrix of explanatory variables

```
orre car vd cr lqr lir mq crr gdp infr roa
(obs=100)

             |      car       vd       cr      lqr      lir       mq      crr      gdp     infr      roa
-------------+------------------------------------------------------------------------------------------
         car |   1.0000
          vd |  -0.3791   1.0000
          cr |   0.7900  -0.4622   1.0000
         lqr |  -0.7385   0.4171  -0.7450   1.0000
         lir |  -0.1945   0.4590  -0.3478   0.3232   1.0000
          mq |   0.2768   0.2678   0.0315  -0.0625   0.3465   1.0000
         crr |   0.2829  -0.6458   0.5833  -0.5848  -0.5250  -0.2614   1.0000
         gdp |   0.1323  -0.3991   0.3133  -0.3487  -0.3963  -0.3437   0.4658   1.0000
        infr |  -0.1273  -0.0298  -0.0241  -0.0300   0.0419  -0.2797   0.3120   0.1891   1.0000
         roa |  -0.7931   0.5407  -0.7206   0.8069   0.4534   0.0122  -0.5580  -0.3571   0.0677   1.0000
```

The Pearson correlation, which varies between -1 and 1, if the p-value is 0, there is no linear correlation, and if the p-value is -1 or 1 we have a perfectly negative or positive relationship between the variables. Since there is no correlation above 0.8 inthis study according to Cooper and Schendlar (2003) and Lewis-Beck (1993), it can beconcluded in this study that

there is no multi-collinearity problem, or tolerable multicollineriaty thus improves thereliability for regression analysis.

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

The results so far shows that all CRLM assumptions were not violated, so the ordinary least square estimation can be safely applied. However, since this study uses a panel data, there are two types of panel data estimator approaches that can be applied. These are fixed effects models (FEM) and random effects models (REM) (Brooks, 2008). The simplest types of fixed effects models permit the intercept value 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 null hypothesis for this test is that unobservable heterogeneity term is not correlated or random effect model is appropriate, with the independent variables. If the null hypothesis is rejected then we employ random effects method.

The Hausman test hypothesis is

H0: *Random effect model is appropriate*

H1: *Fixed effect model is appropriate*

Table 4.6Hausman Test

Correlated Random Effects - Hausman Test

```
. hausman fixed random

                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |     fixed        random       Difference          S.E.
-------------+------------------------------------------------------------
         car |    2.603755      3.12811      -.5243547        .8601731
          vd |    6.849894     5.894176       .9557178        1.011148
          cr |   -22.88169    -23.94152        1.05983        1.969882
         lqr |    -1.31712    -1.343776       .026656        .0628064
         lir |    7.631112      6.93161       .6995023        1.460233
          mq |   -.0512101    -.0524226       .0012126        .0313427
         crr |   -2.610641    -2.853209       .2425679        .7065049
         gdp |   -5.920441    -6.130967       .2105263        .3701441
        infr |   -.2087264       -.18932      -.0194064         .118884
         roa |    .0559901     .0886702      -.0326801        .0224823
------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(10) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                           =          7.25
                Prob>chi2 =        0.7013
                (V_b-V_B is not positive definite)
```

Table 4.6 above shows Hausman specification test, the P-value of models is 0.7013, which is greater than 5% level of significance. Since, the null hypothesis of the random effect is appropriate is failed to be rejected at 5 percent of significant levelrandom effect model is more appropriate than fixed effect model and gives more comfort that random effects model results are valid.

4.5. Regression results analysis and Discussions

4.5.1. Operational model

The empirical findings from the econometric results on the determinants of private commercial banks lending in Ethiopia are presented in this section. This section contains the empirical regression model used in the study and the output of the regression analysis. The following empirical model was used to identify the determinant factors that can affect the private commercial banks lending in Ethiopia.

LogTLAit = f (α0+ β1CARit, β2VDit, β3CRit, β4LQrit, β5LIRit, β6MQit, β7CRrit, β8GDPit, β9INFit, β10ROAit, + μit) …… (2)

Source: developed by researcher

Where:

LogTLAit: Natural logarithm of Total Loan and advance of bank i at time t.

CARit: Capital Adequacy of bank i at time t.

VDit: Deposit ratio of bank i at time t.

CRit: credit risk of bank i at time t.

LQrit: Liquidity ratio of bank i at time t.

LIRit: Interest Rate (Lending Rate) of bank i at time t.

MQit: management quality of bank I at time t.

CRrit: Cash reserve required of bank i at time t.

GDPit: gross domestic product at time t.

INFit: Inflation rate at time t.

ROAit: Return on Asset of bank i at time t.

μit: is the error term for bank i at time t assumed to have mean zero.

α0: is the intercept or constant of the regression line.

t: time from 2009-2018

From β1 to β10: are parameters or coefficients of the independent variables estimated

The coefficients of explanatory variable were estimated by the use of ordinary least square (OLS) technique. The regression result in Table 4.7demonstrates both coefficients of explanatory variables and corresponding p-values.

Table 4.7 RandomEffect panel Model Regression output

```
. reg tla car vd cr lqr lir mq crr gdp infr roa
```

Source	SS	df	MS		
Model	37.3434681	10	3.73434681	Number of obs	= 100
Residual	10.2633618	89	.115318672	F(10, 89)	= 32.38
				Prob > F	= 0.0000
Total	47.6068299	99	.48087707	R-squared	= 0.7844
				Adj R-squared	= 0.7602
				Root MSE	= .33959

tla	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
car	3.470124	1.638864	2.12	0.037	.2137361	6.726511
vd	4.442446	.9993086	4.45	0.000	2.456841	6.42805
cr	-22.82723	8.675021	-2.63	0.010	-40.06431	-5.590147
lqr	-1.423873	.5986632	-2.38	0.020	-2.613404	-.2343424
lir	3.41779	3.990918	0.86	0.394	-4.51208	11.34766
mq	-.0794257	.0668364	-1.19	0.238	-.2122282	.0533769
crr	-3.682851	1.441472	-2.55	0.012	-6.547026	-.8186763
gdp	-7.247072	3.71183	-1.95	0.054	-14.6224	.1282543
infr	-.1541504	.4244222	-0.36	0.717	-.9974683	.6891675
roa	.1663244	.079413	2.09	0.039	.0085324	.3241163
_cons	8.058408	1.438405	5.60	0.000	5.200327	10.91649

Source: computed from STATA 11

Multiple regression analysis was conducted to establish the relationship between average total loan and the independent variables.

The multiple regression equation is stated below

LogTLAit = 8.0584+ 3.47CAR+ 4.44VD-22.82CR-1.42LQr+3.41LIR-0.07MQ-3.68CRr-7.24GDP-0.15INF+0.16ROAit, + μ

The panel random effect estimation regression result in the above table 4.7 shows coefficient intercept (α) is 8.0584. This means, when all explanatory variables took a value of zero, the average value TLA would take 8.0584 unit and statistically significant at 1% of significance level.

Interpretation of R-squared

R-squared coefficient of (0.7844) obtained from the estimated model means that 78.44% of the explanatory variables used to estimate the model were able to explain the dependent variable.

The R-squared result measures how well the regression model explains the actual variations in the dependent variable (Brooks, 2014).

Interpretation of Adjusted-R squared

The adjusted R-square result indicates that the changes in the independent variables explain 76.02% of the changes in the dependent variable. That is capital adequacy, volume ofdeposit, credit risk, liquidity ratio, lending interest rate, management quality, cash reserve, return on asset, real GDP growth and inflation rate collectively explain 76.02% of the changes in total loan and advances. The remaining 23.08% of changes was explained by other factors which are not included in the model. Thus these explanatory variables collectively, are good explanatory variables of the total loan and advances of private commercial banks in Ethiopia.

Interpretation of Overall Model Significance (F-statistic)

In general the whole model is statistically significant. Since the model's F-statistics tests the fitness of the model and a recommended F-statistics should be greater than 5 for it to be considered fit, the study obtained an F-statistic of 32.38 which is greater than 5 hence the model was fit for estimation (Brooks, 2014).

The regression F-statistic (32.38) and the p-value of zero attached to the test statistic reveal that the null hypothesis that all of the coefficients are jointly zero should be rejected. Thus, it implies that the explanatory variables in the model were able to explain variations in the

dependent variable. P-value of 0.0000 indicates strong statistical significance, which enhanced the reliability and validity of the model.

4.5.2. Interpretation of regression results

Capital Adequacy Ratio (CAR) and Loans and advances (TLA)

As indicated in table 4.7 above the coefficient of capital adequacy measured by the ratio of paid-up capital to total asset is 3.4701 and its p-value is 0.037. This shows that holding other explanatory variables constant at their average value, when Capital adequacy ratio increased by one percent, total loans and advances (TLA) of sampled private commercial banks would be increased by 3.47 percent and statistically significant at 0.05 significant levels. Therefore, the researcher failed to reject the hypothesis that capital adequacy ratio has a positive effect on loans and advances. This result is supported by the prior findings of (Bouvatier&Lepetit, 2007), (Djiopap & Ngomsi, 2012), Imran and Nishat (2012) and Ajayi (2007). The basic argument of these researchers for the positive relationship between bank capital and lending is that banks with larger capital cushion against credit risks should have higher capacity to grant risky, long-term loans. Therefore, increasing banks equity enhances the banks capacity to increase lending. In addition, banks with better capital can attract more creditworthy borrowers that will be eligible for longer term loans. But the result is in contrary to the finding of Ehrmann et al., (2003) who founds that there is no relationship between capitalization level of European banks and supply of loan.

Besides, inconsistency of finding among the researchers, opinion differs among experts in banking and finance as to what constitutes adequate capital. Because, high levels of capital allow banks to can expose risk averse and conservatively managed banks that may be reluctant to issue risky long-term loans. According to Nwankwo (1991) adequate capital is the quantum of funds which banks should have or plan to maintain in order to conduct its business in a careful manner.

The possible reason for the positive relationship between capital and private commercial bank lending in Ethiopia could be the fact that thebase of fund for lending is shareholder contribution in the form of equity and customers deposit. As a result, capital adequacy can affect the commercial bankslending both directly and indirectly. With the direct effect, since the capital itself used as a source of fund for lending, well capitalized banks has the ability to extend more loans than poor capitalized banks. This indicates that as private commercial banks raise their capital they can grant more loans and advances to their clients.

On the other side of indirect effect adequate capital in banking is a confidence booster both on banks and clients. It provides the clients, the public and the regulatory body with confidence in the sustained financial viability of the bank. Confidence to the depositor that their money is safe enhances the deposit of the banks as well as liquidity of the banks and total loan and advances. The increase in the liquidity of the commercial banks enables the banks to grant more loans and advances.

Volume of Deposit (VD) and Loans and Advances (TLA)

As Table 4.7 above shows that, the coefficient of volume of deposit (VD) which was measured by the ratio of total deposit to total assets is 4.4424 with the p-value of 0.000. This indicates that holding other independent variables constant at their average value, when volume of deposit increased by one percent, total loans and advances (TLA) of sampled private commercial banks would be increased by 4.44 percent and statistically significant at .01 significantlevels. As a result, the researcher failed to reject the hypothesis that volume of deposit has positive and significant impact on total loans and advances. This means, there is no adequate evidence to hold the negative relationship between volume of deposit and loans and advances of private commercial banks.

This positive relationship between volume of deposit and total loans and advances is consistentwith prior research results of (Amano, 2014), Malede (2014), Ajayi (2007), Ituwe(1985) and Ojo (1978) who found the positive association between deposit level and loans and advances.

The positive and significant association between volume of deposit and lending of private commercial banks in Ethiopia may be related to the factor of insignificant fluctuation in the liquidity and cash reserve in the country during sample period which help the banksto lend more of their deposits.

Credit risk (CR) and Total Loans and Advance (TLA)

As shown in the table 4.7 the coefficient of credit risk (CR) which was measured by the ratio of nonperforming loans and advances to total loans and advances is -22.8272 with the p-value of 0.010. This indicates that holding other independent variables constant at their average value, when credit riskor non-performing loan increased by one percent, total loans and advances (TLA) of sampled private commercial banks would be decreased by 22.82 percent

and statistically significant at 1% level of significance. Therefore, the researcher failed to reject the hypothesis that credit risk has a negative effect on total loans and advances of commercial banks. This means, there is no adequate evidence to support the positive association between credit risk and total loans and advances.

The result is similar with the previous studies of Alhassan et al., (2013), Djiogap and Ngomsi,(2012), Rabah, (2015) and Tomak, (2013) who founds that a significant negative relationship between NPLs and bank lending behavior However, it is contrary with the studies of Malede, (2014) that founds a positive association between NPLs and total loans and advances.

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

Besides, if banks have high non-performing loans it indicates the existence of high credit risk. This adversely impacts the trust of the bank which in turn reduces deposit of the bank which is the main source of commercial banks loans and advances. This tends the private commercial banks to lower their credit extension.

Liquidity (LQr) and Total Loans and Advances (TLA)

Table 4.7 presented that, the coefficient of liquidity (LQr) measured by current asset to current liability ratio is -1.4238 and its P-value is 0.020. Holding other independent variables constant at their average value, when liquidity (LQr) increased by one percent, total loans and advances (TLA) of sampled private commercial banks would be decreased by 1.42 percent and statistically significant at 0.05 level of significant. Therefore, the researcher rejects the null hypothesis that liquidity has positive impact on loans and advances. This means, there is evidence to support the negative relationship between liquidity and loans and advances.

The result of negative association between liquidity and total loans and advances is contrary to prior research findings of (Malede, 2014), Ajayi (2007), (Ituwe, 1985) and (Ojo, 1978).

However, it is consistent to the findings of Amano, (2014), Benjamen and Onyeuchi, (2015) and Rabah, (2015) who finds the negative relationship between loans and advances.

The negative impact of liquidity ratio on bank's loan and advance would be based on the argument of taking loans as illiquid assets of banks. According to this argument when the amount of loans provided by banks increase, the amount of illiquid assets in the total assets portfolio of banks increase and lead to the reduction in the level of liquid assets held by banks. Also, according to Pilbeam, (2005, pp. 42), if demand for loans is weak, then the bank tends to hold more liquid assets (i.e. short term assets), whereas if demand for loans is high they tend to hold less liquid assets since long term loans are generally more profitable. Consistent with these evidences, this study also confirmed a negative association between liquidity ratio and loan and advances of private commercial banks of Ethiopia.

Lending Interest Rate (LIR) and Loans and advances (TLA)

Table 4.7 also indicates that the coefficient of lending interest rate measured by the average annual lending interest rate is 3.4177 and its p-value is 0.394. This indicate that holding other explanatory variables constant at their average value, when lending interest rate increased by one percent, total loans and advances (TLA) of sampled private commercial banks would be increased by 3.4177 percent and statistically insignificant. Therefore, the researcher rejects the null hypothesis that lending interest rate has a negative impact on loans and advances.Hence, Ethiopian commercial banks lending do not affected by lending interest rate. It might be due to a change in borrowers demand for loan in response to interest rate variation, which is not considered in this study. The finding is similar with Usman,(1999) and Malede, (2014).However, it is contrary to the findings of Amano, (2014), Zelalem, (2017) and Aytenew, (2016) who founds the negative relationship.

Cash Reserve Requirement (CRr) and Total Loans and Advances (TLA)

The STATA results of table 4.7, shows the coefficient of the cash reserve requirement which measured by annual reserve requirement rate is -3.6828 and its p-value is 0.012. It implies that holding other independent variables constant at their average value, when cash reserve requirement increased by one percent, total loans and advances (TLA) of sampled private commercial banks would be decreased by 3.68 percent and statistically significant at 5% level of significant. Therefore, the researcher failed to reject the null hypothesis that cash reserve

has a negative impact on loans and advances. This means, there is no evidence to support the positive association between cash reserve requirement andtotal loans and advances.

The expected negative relationship of cash reserve requirement and loans and advances is consistent with the result of (Christian & Pascal, 2012), (Cargill and Mayer, 2006), and (Zelalem, 2017). The justification provided in the empirical literature on negative significant association between cash reserve requirement and commercial banks lending is that, in the banking business, cash reserve requirements are imposed on banks by the national or central bank of a given country to achieve financial stability in the following manner. They can raise reserve requirements to contain credit growth in the boom part of the business cycle in order to neutralize financial imbalances in the economy or in an economic recession, they can lower cash reserve requirements to utilize reserve buffers accumulated in the boom time, having the banking sector extend more credit to their customers. However, the result of this study is contrary with the findings of Olusanya et al., (2012), Ayetenew, (2016) and Amano, (2014) that reveal required reserve has positive impact on commercial bank loans and advances (i.e. banks credit raise when cash required reserve increase).From this it is logical to conclude that the evidence is not consistent in indicating that whether cash reserve requirement affects commercial banks lending or not.

The negative relationship between cash reserve and private commercial banks lending in Ethiopia could be endorsed to the fact that, the National Bank of Ethiopia like other countries central bank use the reserve as a tool to control the amount of loans and advances extended by private commercial banks in Ethiopia to maintain financial stability.

Management Quality (MQ) and Total Loan and Advances (TLA)

As shown in table 4.7 above, the coefficient of Management quality ratio which is measured by operating expense to operating income ratio is -0.079 with its p-value of 0.238. It was statistically insignificant even at 10% significance level. And it is negatively correlated to the TLA which is not complies with the expected sign. As management quality measured in this study operating expense to operating income an increase in MQ demonstrates the increased in operating incomemakes management not worry about lending more to cover the operating expense and earning profit from lending. That explains the negative relationship between management quality and total loan and advances. The result supports the finding of Al-Kilani, (2015) who studied the cyclicality of lending behavior in Jordan. The management

efficiency is important to improve the performance of banks and the ability of lending. When MQ increases that indicate an increase in operating incomebanks will not be eager to lend more in order to cover their expenses and earn profit from lending hence they earning high compared to the expense.

Gross Domestic Product (GDP) and Loans and advances

As it can be seen in the above table 4.7, the coefficient of gross domestic product (GDP) growth measured by real gross domestic product growth rate is -7.2470 and its P-value is 0.054. Holding other independent variables constant at their average value, when gross domestic product (GDP) increased by one percent, total loans and advances (TLA) of sampled Ethiopian private commercial banks would be decreased by 7.2470 percent and significant at 0.10 level of significant.Therefore, the researcher rejects the hypothesis that growth in gross domestic product has a positive impact on loans and advances. This means, there is evidence to support the negative relationship between gross domestic product and loans and advances.

The result of the regression output is consistent to the findings ofTomak, (2013),Ladime et al., (2013),Aytenew, (2016) which states that there are negative relationship between gross domestic product and lending behavior of commercial banks in Ethiopia.

However, according to Tomak, (2013) the insignificancy of GDP can be explained by firm's high demand for credit or financial constraints and supply side constraints in credit to firms. Hence, it can be concluded that Ethiopian commercial banks lending is less dependent on the business cycle. This revealed that the lenders expectations do not depend on current phase of business activities.

On the other hand, the result of this study is contrary to the previous works of (Athanasoglou et al., 2008), (Dietrich &Wanzenried, 2011), (Djiopap&Ngomsi, 2012), (Mansor, 2006), (Micco and Panizza, 2004), (Malede, 2014), (Olokoyo, 2011), (Prutean-Podpiera, 2007).

Inflation Rate (INFr) and Loans and advance (TLA)

The regression output of the study in Table 4.7 above shows that the coefficient of Inflation rate (INFr) measured by annual inflation rate is -0.1541 and its P-value is 0.717. Holding other explanatory variables constant at their average value, when inflation (INFr) increased by one percent, total loans and advances (TLA) of sampled Ethiopian commercial banks in

Ethiopia would be decreased by 0.15 percent and statistically insignificant. Therefore, the researcher failed to reject the null hypothesis that states inflation has a negative impact on loans and advances. This means, there is no sufficient evidence to support the negative relationship between inflation and loans and advances.

This result is consistent to the study results of Naceur, (2009), Banm et al., (2005) and Olaiyan, (2000) who founds the negative relationship between inflation and loans and advances. The main reason for negative relationship is that, the main activity of banks (mostly commercial banks) is lending and the market is therefore based on an offer of credit by banks and demand from individuals and companies. Inflation reduces the supply and demand for credit because it increases uncertainty about the future of the business market. This fall in demand would lead to a decline in lending. The rise in inflation results in decreasing real lending interest income for the commercial banks which in turn decreases the lending motive of the banks.

On the other hand this result is contrary to the study result of Amano, (2014) and Nkusu, (2011) who founds the positive association between inflation rate and loan and advances. According to these researchers higher inflation can improve the loan payment capacity of borrower by reducing the real value of outstanding amount. As a result, the collection of the loans according to its repayment schedule increases the lending capacity of the commercial banks. Moreover, the on time repayment reduces the amount of non-performing loans which adversely affect the lending and capital of commercial banks, thus it enhances the lending ability of commercial banks.

Return on Asset (ROA) and Total Loan and Advances (TLA)

As shown in the table above the estimation coefficient of return on asset is 0.1663 with its p-value of 0.039. This indicates that Return on asset ratio is significant at 5% significance level, as the study expected the return on asset positively correlated with the dependent variable (TLA). This result is consistent to the Laidroo, (2012), Ayman Mansour, (2016), Gunji and Yuhan,(2010) and yazankudah, (2017) who founds, that an increase in return on asset leads to increase in total loans to asset ratio. An increase in ROA leads to increase in the amount of loans because banks feel less risky to extend moreloans and also to avoid any increase in cost by holding this money, this construes the positive correlation between ROA and TLA. In addition to this, due to the increment of banks income overtime banks lend more their income rather keeping it as a reserve.

Table 4.9 Comparison of test results with expectation

Independent Variables	Expected relationship with TLA	Actual result	Statistical significance test	Hypothesis status
Capital Adequacy Ratio	Positive	Positive	Significant at 0.05 level	Failed to reject
Volume of Deposit	Positive	Positive	Significant at 0.01 level	Failed to reject
Credit Risk	Negative	Negative	Significant at 0.01 level	Failed to reject
Liquidity Ratio	Positive	Negative	Significant at 0.05 level	reject
Return on Asset	Positive	Positive	Significant at 0.05 level	Failed to reject
Lending Interest Rate	Negative	Positive	insignificant	reject
Management Quality	Positive	Negative	insignificant	reject
Cash Reserve Requirement	Negative	Negative	Significant at 0.05 level	Failed to reject
GDP growth rate	Positive	Negative	Significant at 0.1 level	reject
Inflation Rate	Negative	Negative	insignificant	Failed to reject

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

The basic intention of this chapter is to present the overall summary of the research by summing up the main findings of the analysis and guide future research directions. Accordingly, the chapter starts with its discussion by briefly summing up the overviews of the study and its main findings. In section two based on the study finding the researcher highlight some recommendations for the target populations of the study pivoting on and finally highlight further research directions on the area of lending.

5.1. Conclusion and summary

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

The broad objective of this study was to identify the main bank-specific (internal factors) and macro-economic (external factors) that can affect Ethiopian private commercial banks lending and to what degree these determinants affects Ethiopian Private commercial Banks lending. In doing so, previous studies on lending have been reviewed and it is summarized that the lending of bank is usually expressed as a function of internal and external determinants. The internal(bank specific) determinants refers to those factors originate from bank accounts (balance sheets and/or profit and loss accounts) and external(macro level) determinants are variables that are not associated to bank management but reflect the economic and legal environment that affects the operation and performance of financial sectors.

Many empirical literatures identified different variables as an influential factor of lending. However, based on the realistic context of Ethiopian commercial banks the researcher selected ten variables namely: volume of deposit, credit risk, liquidity ratio, cash reserve requirement rate, capital adequacy ratio, lending interest rate, return on asset, management

quality, inflation rate and gross domestic product growth rate as independent variables and dependent variable of total loans and advances (as a proxy for lending). The analysis was conducted using panel data estimation technique of random effect modelwith STATA 11 statistical software package. The study passed through all diagnostic tests, like multicollinearity, heteroscedasticity, normality distribution and autocorrelation. Hence, the test result indicates that the data was found to be homoscedastic, free of autocorrelation free of Multi-collinearity and normally distributed. The descriptive statistics revealed the data to be normal. Also the coefficient of determination (R2) is 0.784indicating the model is 78% fit to the data. This indicates that the explanatory variables were able to explain 78.4% of the total variations of the dependent variable bank lending.

The regression result shows the, capital adequacy ratio, volume of deposit and return on asset had positive and statistically significant impact on the bank's lending whereas lending interest rate had positive but insignificant impact on lending. On the other hand, credit risk, cash reserve requirement rate and liquidity ratio had negative and statistically significant impact on the lending decision.

Liquidity ratio (LQr) found to have negative and significant relationship with the lending of private commercial banks in Ethiopia. The negative relationship between loans and advance of Ethiopian commercial banks and their liquidity ratio is possibly banks hold high amount of liquid assets, that are easily converted to cash at low cost, since they are liable to meet depositors at any time. If this is the case, holding large amount above the optimum level may diminish the volume of credit allowed to customers. Also it maybe if they do not issue immediate loan from surplus liquid assets.

Capital adequacy ratio also found to have positive and significant impact on the lending decision of private commercial banks in Ethiopia. This implies that in Ethiopia well capitalized banks extend more loans and advances to their customers than poorly capitalized banks. This due to the fact that adequate capital in banking on one hand directly increases the liquidity of the of commercial banks in Ethiopia and on other hand indirectly used as a confidence booster to the depositor that his/her money is safe and enhances the deposit as well as solvency of the banks. This enables the banks to extend more loans and advances.

Volume of deposit found to have positive and significant relationship with private commercial banks lending in Ethiopia. The finding indicates that an increase in volume of deposit leads to increases in the lending of private commercial banks in Ethiopia. Its

significance indicates that, the increase in volume of deposit and loan and advances were proportional during the sample period.

Credit risk is the main factor that has a great negative impact on Ethiopian private commercial banks lending. High and consistent NPL will erode a bank capital adequacy, diminish its profitability and ultimately affects its intermediation function. So, banks should establish applicable credit policies and arrangements, and critically consider the creditworthiness and performing ability of their debtors.

An increase in ROA leads to increase in the amount of loans because banks feel less risky to extend more loans and also to avoid any increase in cost by holding this money, this takes the positive relationship between ROA and TLA. In addition to this, due to the increment of banks income overtime banks lend more their income rather keeping it as a reserve.

5.2. Recommendations

Based on the research findings and conclusions above, the following possible recommendations are forwarded.

- Among bank specific variable capital adequacy is the major factor that positively and significantly affects the lending of private commercial banks in Ethiopia. Hence, banks need to work more towards improving their level of capitalization so as to increase their lending ability and to ensure their profitability.
- As it affects lending positively Ethiopian commercial banks should enhance their strategies in mobilizing deposits from the public by creating awareness in the society to increase saving and they have to improve their service excellences, branch expansion, promotional effort, and using new banking technology. Because the studies indicate that deposit plays a great role as a source of funds for giving loan and advances.
- Even if the regularly measures taken by the central bank to control the economy as a whole and to maintain soundness and stability of financial sector some regulations like cash reserve requirement ratio should have managed carefully as it has adverse impact on commercial banks lending ability.
- Credit risk is one factor that negatively and significantly affects the lending of private commercial banks in Ethiopia. Thus, banks might revise or re-emphasized their credit

procedures, policies and analytical capabilities and these efforts should be expanded into full credit management including origination, approval, monitoring and problem loans management to reduce the credit risk that will result in non-performing loans.

- Also the study recommends private commercial banks to work hard in improving return on assets by reducing expense as it positively and significantly related to lending of commercial banks Ethiopia. The study suggests that banks should work more by their assets which reduce the cost of business.

5.3. Future Research Recommendations

This study investigated the determinants of lending of private commercial banks in Ethiopia by using selected macroeconomic and banks specific variables. However, these variables are not complete. Thus, it is recommended for future researchers to further assess determinants of lending commercial banks in Ethiopia by incorporating additional bank specific, industry specific and macro-economic variables. Moreover, this studywas focused only on the supply side determinants of lending commercial banks. Therefore, it is also recommended for future researchers to investigate it by incorporating the demand side variables of lending determinants. Finally, this study used only secondary data. Therefore, it is recommended for future researchers to study the determinants of lending of commercial banks by qualitative and quantitative approach using primary and secondary data.

References

Abdkarim, M., Mohdharif, A., &Adziz, A. (2007).Monetary Policy and Sectoral Bank Lending in Malaysia.*Global Economic Review, 35*(3), 303-326.

Adedoyin ., &Sobodun. (1996). Commercial Banks Lending Activities in Nigeria.*Nigerian Financial Review, 9*(3), 36-37.

Adepoju, A., Salau, A., &Obayelu, A. (2007). The Effects of External Debt Managements on Sustainable Economic Growth and Developments: Lesson from Nigeria. *Munich Personal Repec Archive (MPRA) Paper No. 2147 March Series*.

Admas,John, T.A.,Khan H.,Raeside R.,& White D.,(2007).Research Methods for Graduate Business and Social Science Students.

Alemayehu, G. (2006). The Structure and Performance of Ethiopia's Financial Sector in the Pre and Post Reform with a Special focus on Banking. Research paper No. 2006/112. Helsinki: UNU World Institute for Development Economics.

Alhassan, A., Brobbey, F., &Asamoah, M. (2013). Does Asset Quality Persist on Bank Lending Behaviour? Evidence from Ghana.*Global Journal of Management and Business Research Finance, 13*(4).

Amano, G. (2014). Determinants of lending Behavior of Banks: A Case study on Commercial Banks of Ethiopia. MSc Project Paper.Unpublished, Addis Ababa University.

Athanasasoglou, P., Brissimis, S., & Delis, M. (2008). Bank-specific, Industry-specific and Macroeconomic Determinants of Bank Profitability .*International FinancialMarkets, Institution and Money, 18*, 121-36.

AyitenewTemesgen, 2016, Determinants of Bank's Lending Behavior in Ethiopia - Pragmatic Evidence from Commercial Banks, Injibara University.

Ayman Mansour KhalafAlkhazaleh, (2017). Factors may drive the commercial banks lending: evidence from Jordan. Banks and Bank Systems, 12(2), 31-38.

Baltagi, B. (2005). *Econometric Analysis of Panel Data* (3 ed.). Chichester: John Wiley &Sons.Ltd.

Baral, J. (2005). Health Check-up of Commercial Banks in the Framework of CAMEL: A Case Study of Joint Venture Banks in Nepal. *Journal of Nepalese Business Studies, 2*(1), 41 55.

Barrickman, J. (1990). Successful Commercial Lending from the Ground up Bottom Line. *7(2)*, 12-14.

Baum, Christopher F., Mustafa, C., and Neslihan, O. (2005).The Second Moment Matter.The Response of Bank Lending Behavior to Macroeconomic Uncertainty.

Behr, p., Norden, L., &Noth, F. (2013).Financial Constraints of Private Firms and Bank Lending Behavior.*Journal of Banking and Finance, 37*, 3472-3485.

Berger, AN., and Udell, G F. (1992).Some Evidence on the Empirical Significance of Credit Rationing. The Journal of Political Economy, *100*, 1047-1077.

Berger, AN., and Udell GF. (2006). A More Complete Conceptual Framework for SME Finance‟ Journal of Banking and Finance, *30*, pp. 2945-2966.

Berlin, M., &Mester, L. J. (1998).On the profitability and cost of relationship lending. *Journal of Banking & Finance*, 22(6), 873-897.

Blinder, A., &Stiglitz, J. (1983).Money, Credit Constraints and Economic Activity.*American Economic Review paper and Proceedings, 73*, 297-302.

Boland, Vincent. (2009). Modern dilemma for world oldest bank.Financial Times.Retrieved 23 February 2010.

Bouvatier, V., &Lepetit, L. (2007). Bank's Pro-cyclical Behavior: Does Provisiong Matter? *Journal of International Financial Markets, Institutions and Money, 321*, 1-14.

Brooks, C. (2008). Introductory Econometrics of Finance (2nd ed). The ICMA Center, University of Reading, CAMBRIDGE University press.

Brooks, C. (2014).Introductory Econometrics for Finance (3rd ed): New York, Cambridge University Press.

Carletti, E., Cerasi, V. and Daltung, S. (2006). Multiple-Bank Lending: Diversification and Fragility: A Theory of Banking. *Working paper*.University of Chicago.

Chodechai, S. (2004).Determinants of Bank Lending in Thailand.Unpublished Thesis.

Cooper, C., &Schender , D. (2003). *Business Research Methods* (8 ed.). New York: McGraw Hill/Irwin.

Creswell, J. (2003). *Research design: a qualitative, quantitative and mixed method approaches.* 2nd ed. California: Sage Publications.

Creswell, J. (2009). *Research Design: Qualitative, Quantitative and Mixed Methods Approaches* (3 ed.). California: Sage publications.

Diamond, D., &Rajan, R. (1998). Liquidity Risk, Liquidity Creation and Financial Fragility: A Theory of Banking. *Working paper*.University of Chicago.

Djiopap, C., &Ngomsi, A. (2012).Determinants of Bnak Long-term Lending Behavior in the Central African Economic and Monetary (CEMAC).*Review of Economicsand Finance, Academic Research Center of Canada*, 107-114.

Ehrmann, M., Gambacorta, J., Martinez-Pages, P., &Sevenstreand, A. (2003).The Effect of Monetary Policy in the Euro.*19*, 58-72.

Ethiopian Economic Association (EEA), (2011). Report on the Ethiopian Economy. Addis Ababa Ethiopia.

Ewert, R. & Schenk, G. (1998).Determinants of Bank Lending Performance.Working Paper, Center for Financial Studies, University of Frankfurt.

Ewert, R., Szczesmy, A., & Schenk, G. (2000).Determinants of Bank Performance in Germany.*Business Review, 52*, 344-46.

Ezirim, F. (2005).Impact of Bank Lending on Liquidity of Banks in Banks in Nigeria. 2, 44-56. IJJS Publication.

Flamini, V., McDonaled, C., & Schumacher, L. (2009).The Determinants of Commercial Banks Profitability in Sub-Saharan Africa.IMF Working Paper.

Gaiotti, E., &Secchi, A. (2006). Is there the cost of channel of monetary policy transmission? An Investigation into the pricing behaviour of 2,000 firms.*Journal of Money, Credit and Banking*, *38*(8), 2013-37.

Gujarati, D. (2004). Basic Econometrics (4 ed.). Boston: McGraw Hill.

Gunji, H., & Yuan, Y. (2010). Bank profitability and the bank lending channel: Evidence from China. *Journal of Asian Economics*, 21(2), 129-141.

Guo, K., and Stepanyan, V. (2011).Determinants of Bank Credit in Emerging Market Economies.IMF Working Paper WP/11/51.

Hair, J., Anderson, R., Tatham, R., & Black, W. (1998).Multivariate Data Analysis. 5th ed. New Jersey: Pearson Prentice Hall.

Hoggson, N. F. (1926). *Banking Through the Ages*, New York, Dodd, Mead & Company.

ItanaAyana, (1994). Rural credit and agricultural development, Ethiopian Economic Association, conference paper.

Ituwe , C. (1985). Elements of Practical Banking.*Handbook*.Ibadan University Press.

Jeoitta, C. (2007). Credit Risk Management: How to Avoid Lending Disasters and Maximize Earning (3rd ed). Mercy College, McGraw-Hill.

Johnson, P., and Clark, M. (2006).Mapping the terrain: an overview of business and Management research methodologies.

Kapoor, S. (2013). Banks: How they work and Why Are They Fragile.

Kashif, I., and Mohammed, N. (2008). Determinants of Bank Credit in Pakistan: A Supply Side Approach, Paper presented at the proceedings of 2nd International Conference on Business Management, University of Karachi, Karachi.

Kashyap, A., & Stein, J. (2000). What do a million bank observations have to say about the transmission of monetary policy? *American Economic Review, 90*(3), 407-28.

Kasman , A. (2010). Consolidation and Commercial Bank Net Interest Margins: Evidence from the Old and New European Union members and Candidate Countries. *Economic Modeling, 27*, 648-655.

Kishan , R., &Opiela, T. (2000). Bank Size, Bank Capital and the Bank Lending Channel.Journal of Money, Credit and Banking, 32(1), 121-41.

Kothari, C.R., (2004). Research methodology.2nd Ed. New Delhi: New Age International Ltd.

Laidroo, L. (2012). *Lending Growth Determinants and Cyclicality: Evidence from CEE Banks.*

Maurice OpiohKhangalah, (2013). Determinants of commercial banks lending behavior in Kenya: case of state owned banks in Kenya, MSc thesis, University of Nairobi.

McKinnon, R. (2009). 'Why banks aren't lending', International Economy, the magazine of international economic policy, pp.20-23. Milano-Bicocca.

Malede, M. (2014). Determinants of Commercial Banks' Lending: Evidence from Ethiopia Commercial Banks. European Journal of Business and Management, 6(20).

Moussa, M. A. B., &Chedia, H. (2016). Determinants of Bank Lending: Case of Tunisia. *International Journal of Finance and Accounting*, 5(1), 27-36.

Naceur, S. (2009). The Determinants of the Tunisian Banking Industry Profitability: Panel Evidence. *Working paper*.UniversiteLibre de Tunis.

National Bank of Ethiopia (NBE), (2008).Asset Classification and Provisioning.4th Replacement. Directive № SBB/043/2008, February, 2008.

National Bank of Ethiopia (NBE), (2008).Licensing and Supervision of Banking Business Reserve Requirement.6th Replacement. Directive № SBB/055/2013, March, 2013.

National Bank of Ethiopia (NBE), (2011).Minimum Capital Requirement for Banks. Directive № SBB/050/2011, September, 2011.

Neelam, T. (2014).Determinants of Bank Lending Behavior in Nepal.Mewar University, Rajasthan, India.The International Journal of Business & Management (ISSN 2321–8916).

Noth, F. (2011). Financial Constraints, Bank Lending Behavour, and Financial Stability. *Discussion Paper*, 1-54.

Ojo, M. (1978).The Demand and Supply of Commercial Banks in Nigeria.*Journal of Money, Finance and Economic Development, 30*(3), 341-354.

Olokoyo, (2011).Determinants of Commercial Banks Lending Behavior in Nigeria.*International Journal of Financial Research, 2*, (2). Covenant University, Nigeria.

Olumuyiwa, OS.,Oluwatosin, OA., and Chukwuemeka, OE. (2012). Determinants of Lending Behavior of Commercial Banks: Evidence from Nigeria.*Journal of Humanities and Social Science, 5*, 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.

Padilla, A., & Pagano, M. (1997).Endogenous Communication among Lenders and Entrepreneurial Incentives.*Review of Financial Studies, 10*, 205-236.

Peek, J., &Rosengren, E. (1995). The Capital Crunch: Neither a Borrower nor a Lender Be. *Journal of Money, Credit and Banking, 3*(1), 625-635.

PekkaAhtiala, (2005). The new theory of commercial banking and bank lending behavior.*Scottish Journal of Political Economy.*

Pham, T. H. H. (2015). *Determinants of Bank Lending.*

Rajender, K. (2009). Management of Non-performing Assets in Public Sector Banks.*The Indian Journal of Commerce, 62*(1), 45-54.

Read, EW. and Gill, EK. (1989). Commercial banking, 4th edn, New Jersey: Engle wood cliffs.

Saunders, M., Lewis, P., &Thornhill, A. (2012).Research Methods for Business students 6th Ed. Pearson Education Limited, England.

Sekaran, U. (2003). *Research Method for Business: A Skill Building Approaches* (4 ed.). John Wiley & Sons.Inc.

Stein, J C. (2000). Information Production and Capital Allocation: Decentralized vs. Hierarchical Firms, NBER Working Paper, No. 7705.

Stiglitz and Weiss, (1991). Analysis of Loan and disbursement in the Commercial Bank (2nd edn), pp. 44-49, Macgraw Hill Publication limited, Uhomoibhi.

Tomak, S. (2013). Determinants of Commercial Banks Lending Behavior: Evidence from Turkey. *Asian Journal of Empirical Research*, *3*(8), 933-943.

Tomola, M. (2013).Analysis of the deposits and lending behaviors of banks in Nigeria.*AdekunleAjasin University*, Akungba-Akoko, Ondo State, Nigeria.

Usman, S. (1999).Bank Regulation and Supervision in Nigeria.*The Nigerian Bankers*, 7-9.

Von-Thadden, E. (2004). Asymmetric Information, Bank Lending and Implicity Contracts: The Winner's Course. Finance Research Letters, 1, 11-23.

YazanQudah, (2017).Determinants of Domestic Banks Lending Behavior Evidence of Jordan MSc thesis, Eastern Mediterranean University, Gazimağusa, North Cyprus.

ZelalemGetachew, (2017). Determinants of Commercial Banks lending: Evidence from Ethiopia, MSc Project Paper. Unpublished, Addis Ababa University.

Zeryehu, S., Kagnew, W., &Teshome, K. (2013).Competition in Ethiopia Banking Sector.*African Journal of Economics*, *5*, 176-190.

Appendixes

List of commercial banks in Ethiopia with establishment year

No	Banks Name	Establishment year
1	Abay Bank S.C.	2010
2	Addis International Bank	2011
3	Awash International Bank	1994
4	Bank of Abyssinia	1996
5	Berhan International Bank	2010
6	Bunna International Bank	2009
7	Commercial Bank of Ethiopia (State Bank)	1963
8	Cooperative Bank of Oromia	2005
9	Dashen Bank	1995
10	Debub Global Bank	2012
11	Enat Bank	2013
12	Lion International Bank	2006
13	Nib International Bank	1999
14	Oromia International Bank	2008
15	United Bank	1998
16	Wegagen Bank	1997
17	Zemen Bank	2009

Appendix- I: Descriptive Statistics of Data

```
. summ tla car vd cr lqr lir mq crr gdp infr roa
```

Variable	Obs	Mean	Std. Dev.	Min	Max
tla	100	9.460743	.693453	8.053	10.904
car	100	.09051	.043435	.037	.377
vd	100	.76552	.0522794	.573	.863
cr	100	.02428	.0171418	.003	.098
lqr	100	1.07047	.1849679	.437	1.451
lir	100	.1194	.0117413	.07	.147
mq	100	1.14137	.6753022	.353	3.569
crr	100	.085	.0452267	.05	.15
gdp	100	.0971	.0113391	.077	.114
infr	100	.1278	.0978638	.027	.38
roa	100	2.9156	1.317839	-3.95	6.72

Source: STATA 11 software output of summarized secondary data

Appendix- II: Test of Heteroscedasticity; White Test Secondary Data

```
. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of tla

         chi2(1)      =     0.59
         Prob > chi2  =   0.4414
```

Appendix- III: Correlation analysis table variables

```
corre tla car vd cr lqr lir mq crr gdp infr roa
(obs=100)
```

	tla	car	vd	cr	lqr	lir	mq	crr	gdp	infr	roa
tla	1.0000										
car	-0.4391	1.0000									
vd	0.7347	-0.3791	1.0000								
cr	-0.6788	0.7900	-0.4622	1.0000							
lqr	0.6094	-0.7385	0.4171	-0.7450	1.0000						
lir	0.5315	-0.1945	0.4590	-0.3478	0.3232	1.0000					
mq	0.2120	0.2768	0.2678	0.0315	-0.0625	0.3465	1.0000				
crr	-0.7506	0.2829	-0.6458	0.5833	-0.5848	-0.5250	-0.2614	1.0000			
gdp	-0.4930	0.1323	-0.3991	0.3133	-0.3487	-0.3963	-0.3437	0.4658	1.0000		
infr	-0.0863	-0.1273	-0.0298	-0.0241	-0.0300	0.0419	-0.2797	0.3120	0.1891	1.0000	
roa	0.7190	-0.7931	0.5407	-0.7206	0.8069	0.4534	0.0122	-0.5580	-0.3571	0.0677	1.0000

Source: STATA 11 software output of summarized secondary data

Appendix- IV: Variable Inflation Factor of Independent Variables

```
 estat ovtest

Ramsey RESET test using powers of the fitted values of tla
       Ho:  model has no omitted variables
                  F(3, 86) =      4.93
                  Prob > F =      0.0633
```

```
. vif
    Variable |       VIF       1/VIF
-------------+----------------------
          cr |     10.08    0.099206
         lqr |      9.53    0.104931
         roa |      9.40    0.106355
         car |      4.35    0.229879
         crr |      3.65    0.274070
          vd |      2.34    0.426779
         lir |      1.89    0.530499
          mq |      1.75    0.571797
         gdp |      1.52    0.657551
        infr |      1.48    0.675186
-------------+----------------------
    Mean VIF |      4.59
```

Source: STATA 11 software output of summarized secondary data

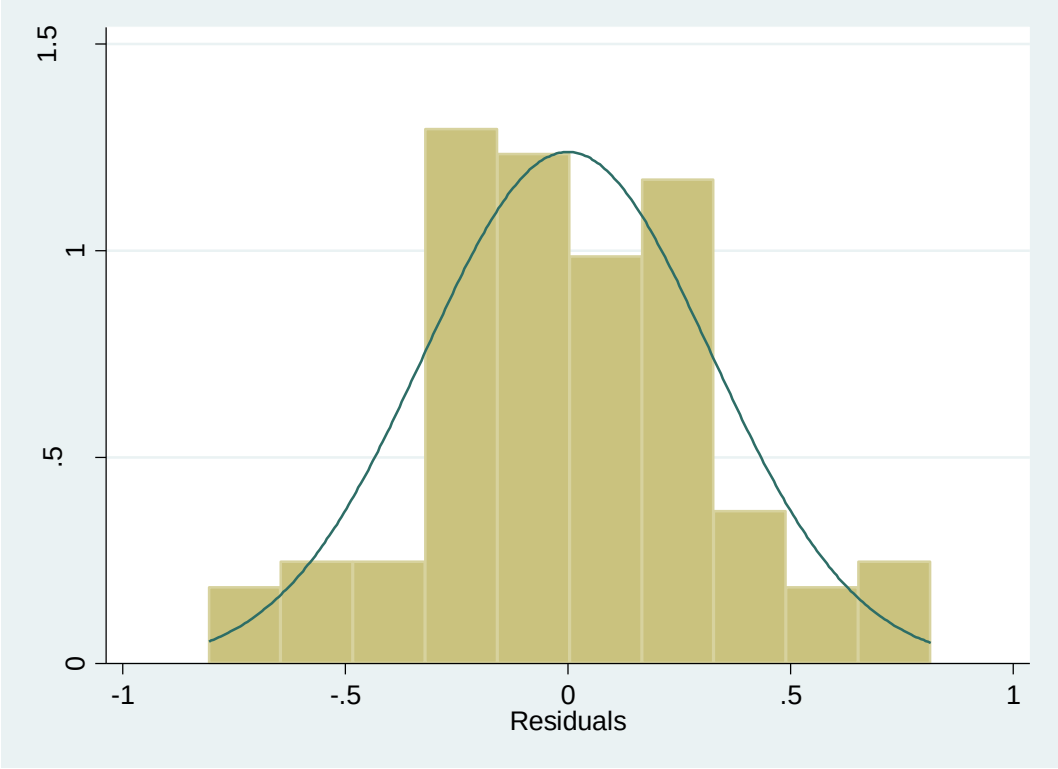
Appendix V: Kurtosis and Skewness Test of Normality

```
. summ resid, detail

                          Residuals
-------------------------------------------------------------
      Percentiles      Smallest
 1%    -.7610793      -.8067827
 5%    -.5653267       -.715376
10%    -.3368291      -.6689986       Obs                 100
25%    -.2101457      -.6400793       Sum of Wgt.         100

50%     -.019101                      Mean           -2.24e-10
                       Largest       Std. Dev.       .3219788
75%     .2076209       .6561936
90%     .4381766       .7440412       Variance        .1036703
95%     .5102748       .7661991       Skewness        .0880207
99%     .7905695       .8149399       Kurtosis        3.090173
```

Source: STATA 11 software output of summarized secondary data

Appendix- VI: Histogram of Residuals

```
 hist resid
(bin=10, start=-.80678272, width=.16217226)
```



Source: STATA 11 software output of summarized secondary data

Appendix- VII: Jarque-Berra Test of Normality

```
. sktest resid

                    Skewness/Kurtosis tests for Normality
                                                      ------- joint ------
    Variable |   Obs   Pr(Skewness)   Pr(Kurtosis)  adj chi2(2)   Prob>chi2
-------------+-------------------------------------------------------------
       resid |   100        0.7025         0.6079         0.41        0.8130
```

Source: STATA 11 software output of summarized secondary data

Appendix- VIII: Durbin Watson Test for Serial Correlation

```
 tsset time
        time variable:  time, 1 to 100
                delta:  1 unit

. estat dwatson

Durbin-Watson d-statistic( 11,   100) =  1.3936198
```

Source: STATA 11 software output of summarized secondary data

Appendix- IX: Correlation Matrix of Independent Variables

```
orre car vd cr lqr lir mq crr gdp infr roa
(obs=100)

             |      car       vd       cr      lqr      lir       mq      crr      gdp     infr      roa
-------------+------------------------------------------------------------------------------------------
         car |   1.0000
          vd |  -0.3791   1.0000
          cr |   0.7900  -0.4622   1.0000
         lqr |  -0.7385   0.4171  -0.7450   1.0000
         lir |  -0.1945   0.4590  -0.3478   0.3232   1.0000
          mq |   0.2768   0.2678   0.0315  -0.0625   0.3465   1.0000
         crr |   0.2829  -0.6458   0.5833  -0.5848  -0.5250  -0.2614   1.0000
         gdp |   0.1323  -0.3991   0.3133  -0.3487  -0.3963  -0.3437   0.4658   1.0000
        infr |  -0.1273  -0.0298  -0.0241  -0.0300   0.0419  -0.2797   0.3120   0.1891   1.0000
         roa |  -0.7931   0.5407  -0.7206   0.8069   0.4534   0.0122  -0.5580  -0.3571   0.0677   1.0000
```

Source: STATA 11 software output of summarized secondary data

Appendix- X: Hausman Test of Model Selection between Random Effect and Fixed Effect

```
. hausman fixed random
```

	Coefficients (b) fixed	(B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
car	2.603755	3.12811	-.5243547	.8601731
vd	6.849894	5.894176	.9557178	1.011148
cr	-22.88169	-23.94152	1.05983	1.969882
lqr	-1.31712	-1.343776	.026656	.0628064
lir	7.631112	6.93161	.6995023	1.460233
mq	-.0512101	-.0524226	.0012126	.0313427
crr	-2.610641	-2.853209	.2425679	.7065049
gdp	-5.920441	-6.130967	.2105263	.3701441
infr	-.2087264	-.18932	-.0194064	.118884
roa	.0559901	.0886702	-.0326801	.0224823

```
                b = consistent under Ho and Ha; obtained from xtreg
     B = inconsistent under Ha, efficient under Ho; obtained from xtreg

  Test:  Ho:  difference in coefficients not systematic

              chi2(10) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                       =         7.25
            Prob>chi2 =       0.7013
            (V_b-V_B is not positive definite)
```

Appendix- XI: Random Effect Regression output of the data

```
. reg tla car vd cr lqr lir mq crr gdp infr roa
```

Source	SS	df	MS
Model	37.3434681	10	3.73434681
Residual	10.2633618	89	.115318672
Total	47.6068299	99	.48087707

```
Number of obs =     100
F( 10,    89) =   32.38
Prob > F      =  0.0000
R-squared     =  0.7844
Adj R-squared =  0.7602
Root MSE      =  .33959
```

tla	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
car	3.470124	1.638864	2.12	0.037	.2137361	6.726511
vd	4.442446	.9993086	4.45	0.000	2.456841	6.42805
cr	-22.82723	8.675021	-2.63	0.010	-40.06431	-5.590147
lqr	-1.423873	.5986632	-2.38	0.020	-2.613404	-.2343424
lir	3.41779	3.990918	0.86	0.394	-4.51208	11.34766
mq	-.0794257	.0668364	-1.19	0.238	-.2122282	.0533769
crr	-3.682851	1.441472	-2.55	0.012	-6.547026	-.8186763
gdp	-7.247072	3.71183	-1.95	0.054	-14.6224	.1282543
infr	-.1541504	.4244222	-0.36	0.717	-.9974683	.6891675
roa	.1663244	.079413	2.09	0.039	.0085324	.3241163
_cons	8.058408	1.438405	5.60	0.000	5.200327	10.91649

Source: STATA 11 software output of summarized secondary data

Appendix- XII: Summary of Secondary Data

Banks	Year	TLA	CAR	VD	CR	LQr	LIR	MQ	CRr	GDP	INFr	ROA
AIB	2009	8.433	0.069	0.746	0.024	1.088	0.105	0.771	0.150	0.100	0.027	2.540
AIB	2010	8.898	0.069	0.751	0.023	1.100	0.115	0.472	0.150	0.106	0.073	2.730
AIB	2011	9.601	0.073	0.769	0.020	1.109	0.115	0.400	0.150	0.114	0.380	2.850
AIB	2012	9.741	0.076	0.786	0.017	1.133	0.115	0.668	0.100	0.087	0.208	3.310
AIB	2013	9.887	0.079	0.806	0.014	1.153	0.115	0.792	0.050	0.099	0.074	3.540
AIB	2014	9.963	0.070	0.810	0.013	1.166	0.115	0.742	0.050	0.103	0.085	3.660
AIB	2015	10.096	0.075	0.821	0.011	1.201	0.115	0.954	0.050	0.104	0.104	4.010
AIB	2016	10.189	0.076	0.829	0.009	1.217	0.120	1.172	0.050	0.080	0.075	4.310
AIB	2017	10.354	0.063	0.839	0.007	1.235	0.140	1.275	0.050	0.101	0.084	5.130
AIB	2018	10.492	0.053	0.863	0.003	1.451	0.140	1.633	0.050	0.077	0.168	6.720
BOA	2009	8.433	0.058	0.771	0.025	1.092	0.105	1.142	0.150	0.100	0.027	2.670
BOA	2010	8.899	0.051	0.780	0.023	1.100	0.105	0.702	0.150	0.106	0.073	2.760
BOA	2011	9.021	0.044	0.796	0.022	1.104	0.115	0.797	0.150	0.114	0.380	2.790
BOA	2012	9.291	0.058	0.808	0.021	1.108	0.115	1.002	0.100	0.087	0.208	2.830
BOA	2013	9.572	0.057	0.810	0.018	1.115	0.115	1.002	0.050	0.099	0.074	2.970
BOA	2014	9.704	0.082	0.812	0.017	1.129	0.115	0.766	0.050	0.103	0.085	3.130
BOA	2015	9.771	0.082	0.817	0.016	1.137	0.115	1.307	0.050	0.104	0.104	3.340
BOA	2016	10.904	0.076	0.821	0.014	1.154	0.122	1.332	0.050	0.080	0.075	3.580
BOA	2017	10.444	0.071	0.837	0.010	1.206	0.145	1.335	0.050	0.101	0.084	4.110
BOA	2018	10.655	0.080	0.844	0.008	1.221	0.145	2.627	0.050	0.077	0.168	4.680
CBO	2009	8.775	0.143	0.746	0.055	0.573	0.115	3.569	0.150	0.100	0.027	1.800
CBO	2010	8.858	0.090	0.754	0.045	0.926	0.115	1.214	0.150	0.106	0.073	1.970
CBO	2011	8.904	0.074	0.760	0.041	0.975	0.115	0.832	0.150	0.114	0.380	2.000
CBO	2012	9.000	0.079	0.766	0.035	1.052	0.115	0.796	0.100	0.087	0.208	2.160
CBO	2013	9.040	0.069	0.776	0.030	1.071	0.115	0.629	0.050	0.099	0.074	2.360
CBO	2014	9.062	0.088	0.780	0.021	1.107	0.115	0.666	0.050	0.103	0.085	2.800
CBO	2015	9.087	0.077	0.792	0.016	1.140	0.125	1.159	0.050	0.104	0.104	3.400
CBO	2016	9.267	0.087	0.807	0.016	1.137	0.132	3.228	0.050	0.080	0.075	3.340
CBO	2017	9.386	0.057	0.822	0.013	1.169	0.132	2.943	0.050	0.101	0.084	3.730
CBO	2018	10.168	0.054	0.835	0.010	1.206	0.132	1.979	0.050	0.077	0.168	4.120
DB	2009	9.649	0.054	0.729	0.020	1.111	0.070	0.635	0.150	0.100	0.027	2.890
DB	2010	9.703	0.048	0.739	0.017	1.124	0.112	0.535	0.150	0.106	0.073	3.120
DB	2011	9.785	0.048	0.750	0.016	1.139	0.112	0.482	0.150	0.114	0.380	3.390
DB	2012	9.910	0.040	0.761	0.014	1.156	0.112	0.510	0.100	0.087	0.208	3.610
DB	2013	9.948	0.037	0.773	0.014	1.158	0.112	0.646	0.050	0.099	0.074	3.640
DB	2014	9.974	0.049	0.772	0.013	1.166	0.112	0.612	0.050	0.103	0.085	3.720
DB	2015	10.062	0.050	0.792	0.012	1.198	0.112	0.803	0.050	0.104	0.104	3.910
DB	2016	10.104	0.052	0.803	0.011	1.203	0.125	0.860	0.050	0.080	0.075	4.050
DB	2017	10.257	0.056	0.813	0.008	1.228	0.125	1.126	0.050	0.101	0.084	4.950
DB	2018	10.367	0.049	0.823	0.007	1.236	0.125	1.563	0.050	0.077	0.168	6.350
LIB	2009	8.672	0.203	0.737	0.061	0.546	0.108	2.079	0.150	0.100	0.027	0.340
LIB	2010	8.766	0.150	0.744	0.057	0.565	0.108	0.754	0.150	0.106	0.073	0.980
LIB	2011	8.830	0.162	0.757	0.046	0.709	0.121	0.798	0.150	0.114	0.380	1.950
LIB	2012	8.987	0.136	0.771	0.040	1.005	0.121	0.720	0.100	0.087	0.208	2.060
LIB	2013	9.120	0.127	0.777	0.036	1.025	0.121	0.707	0.050	0.099	0.074	2.140
LIB	2014	9.188	0.124	0.781	0.033	1.066	0.121	1.060	0.050	0.103	0.085	2.220
LIB	2015	9.452	0.087	0.800	0.023	1.096	0.121	0.984	0.050	0.104	0.104	2.710
LIB	2016	9.634	0.079	0.808	0.020	1.110	0.121	1.199	0.050	0.080	0.075	2.850
LIB	2017	9.739	0.085	0.818	0.017	1.132	0.128	1.616	0.050	0.101	0.084	3.310
LIB	2018	9.868	0.083	0.823	0.015	1.146	0.128	1.803	0.050	0.077	0.168	3.450

NIB	2009	8.346	0.102	0.683	0.027	1.081	0.100	0.763	0.150	0.100	0.027	2.390
NIB	2010	8.406	0.098	0.691	0.025	1.084	0.100	0.626	0.150	0.106	0.073	2.470
NIB	2011	8.442	0.101	0.705	0.024	1.095	0.100	0.597	0.150	0.114	0.380	2.670
NIB	2012	9.569	0.116	0.725	0.021	1.107	0.100	0.669	0.100	0.087	0.208	2.820
NIB	2013	9.657	0.109	0.734	0.020	1.111	0.100	0.978	0.050	0.099	0.074	2.900
NIB	2014	9.733	0.112	0.762	0.017	1.132	0.100	0.982	0.050	0.103	0.085	3.310
NIB	2015	9.838	0.095	0.799	0.015	1.143	0.127	1.458	0.050	0.104	0.104	3.440
NIB	2016	10.076	0.095	0.791	0.014	1.153	0.123	1.886	0.050	0.080	0.075	3.530
NIB	2017	10.330	0.086	0.813	0.012	1.196	0.138	1.641	0.050	0.101	0.084	3.790
NIB	2018	10.513	0.078	0.823	0.011	1.205	0.138	2.339	0.050	0.077	0.168	4.100
OIB	2009	8.053	0.377	0.669	0.098	0.437	0.098	3.438	0.150	0.100	0.027	-3.950
OIB	2010	8.567	0.184	0.683	0.085	0.511	0.121	0.873	0.150	0.106	0.073	0.280
OIB	2011	8.821	0.125	0.690	0.046	0.627	0.121	0.702	0.150	0.114	0.380	1.850
OIB	2012	9.008	0.135	0.705	0.039	1.024	0.121	1.018	0.100	0.087	0.208	2.110
OIB	2013	9.210	0.113	0.720	0.031	1.068	0.121	1.295	0.050	0.099	0.074	2.280
OIB	2014	9.403	0.089	0.728	0.025	1.083	0.121	1.090	0.050	0.103	0.085	2.390
OIB	2015	9.673	0.071	0.749	0.018	1.119	0.121	1.588	0.050	0.104	0.104	3.080
OIB	2016	9.713	0.082	0.771	0.017	1.131	0.122	2.114	0.050	0.080	0.075	3.260
OIB	2017	10.256	0.072	0.785	0.015	1.145	0.130	1.349	0.050	0.101	0.084	3.450
OIB	2018	10.599	0.068	0.803	0.012	1.184	0.130	1.195	0.050	0.077	0.168	3.730
UB	2009	8.333	0.078	0.573	0.028	1.074	0.115	0.917	0.150	0.100	0.027	2.360
UB	2010	8.417	0.064	0.643	0.025	1.087	0.118	0.611	0.150	0.106	0.073	2.540
UB	2011	8.515	0.069	0.686	0.022	1.103	0.118	0.559	0.150	0.114	0.380	2.780
UB	2012	8.611	0.068	0.718	0.020	1.109	0.122	0.724	0.100	0.087	0.208	2.850
UB	2013	9.173	0.062	0.728	0.018	1.117	0.122	1.159	0.050	0.099	0.074	3.000
UB	2014	9.705	0.079	0.741	0.017	1.130	0.122	1.643	0.050	0.103	0.085	3.230
UB	2015	9.836	0.070	0.776	0.015	1.143	0.132	1.529	0.050	0.104	0.104	3.430
UB	2016	9.931	0.073	0.784	0.014	1.157	0.140	1.607	0.050	0.080	0.075	3.630
UB	2017	10.079	0.072	0.802	0.012	1.199	0.121	3.097	0.050	0.101	0.084	3.990
UB	2018	10.172	0.064	0.813	0.010	1.215	0.139	1.884	0.050	0.077	0.168	4.240
WB	2009	8.325	0.104	0.601	0.030	1.070	0.118	0.556	0.150	0.100	0.027	2.300
WB	2010	8.393	0.114	0.652	0.026	1.083	0.118	0.541	0.150	0.106	0.073	2.390
WB	2011	8.464	0.100	0.684	0.023	1.097	0.118	0.513	0.150	0.114	0.380	2.730
WB	2012	8.552	0.117	0.716	0.022	1.105	0.118	0.617	0.100	0.087	0.208	2.800
WB	2013	9.671	0.107	0.721	0.019	1.112	0.118	0.891	0.050	0.099	0.074	2.940
WB	2014	9.663	0.122	0.726	0.019	1.112	0.118	1.072	0.050	0.103	0.085	2.930
WB	2015	9.783	0.111	0.737	0.016	1.139	0.118	1.232	0.050	0.104	0.104	3.370
WB	2016	10.175	0.111	0.755	0.015	1.150	0.123	1.399	0.050	0.080	0.075	3.530
WB	2017	10.315	0.100	0.769	0.012	1.194	0.147	1.213	0.050	0.101	0.084	3.770
WB	2018	10.417	0.084	0.778	0.010	1.212	0.147	1.323	0.050	0.077	0.168	4.200
ZB	2009	8.276	0.215	0.739	0.088	0.471	0.115	1.807	0.150	0.100	0.027	-1.930
ZB	2010	8.584	0.114	0.744	0.074	0.531	0.115	0.409	0.150	0.106	0.073	0.330
ZB	2011	8.810	0.093	0.749	0.047	0.608	0.115	0.353	0.150	0.114	0.380	1.810
ZB	2012	9.015	0.063	0.765	0.040	1.008	0.115	0.471	0.100	0.087	0.208	2.090
ZB	2013	9.137	0.106	0.771	0.036	1.026	0.115	0.709	0.050	0.099	0.074	2.140
ZB	2014	9.155	0.115	0.785	0.035	1.054	0.115	0.482	0.050	0.103	0.085	2.170
ZB	2015	9.334	0.103	0.801	0.027	1.079	0.122	0.688	0.050	0.104	0.104	2.370
ZB	2016	10.112	0.088	0.805	0.022	1.102	0.122	0.674	0.050	0.080	0.075	2.770
ZB	2017	10.399	0.088	0.814	0.020	1.109	0.132	0.627	0.050	0.101	0.084	2.840
ZB	2018	10.599	0.090	0.822	0.017	1.121	0.132	0.831	0.050	0.077	0.168	3.080