DETERMINANTS OF LENDING INTEREST RATE:

/An Empirical Study on Private Commercial Banks in Ethiopia/

BY:

TAYE KIDANE

A Thesis submitted to the Department of Accounting and Finance in partial fulfillment for requirements of degree of Master of Science in Accounting and Finance

Advisor:

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Addis Ababa University

College of Business and Economics

Department of Accounting and Finance

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Addis Ababa, Ethiopia

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Statement of Declaration

I,*Taye Kidane* declare that this thesis entitled:"Determinants of lending Interest rate of private commercial banks' in Ethiopia" and submitted in partial fulfillment of the requirements for the Degree of Master of Science in Accounting and Finance, is outcome of my own effort & study and that all sources of materials used for the study have been duly acknowledged. I have produced it independently with only guidance and suggestion of the thesis Advisor. The study complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

Name: TAYE KIDANE Signature _____ Date11/05/2019

Statement of Certification

This is to certify that the thesis prepared by Taye Kidane, entitled:"Determinants of lending Interest rate of private commercial banks' 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.

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Advisor: Habtamu Berhanu /PhD/Signature _____Date 11/05/2019

ADDIS ABABA UNIVERSITY

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DEPARTMENT OF ACCOUNTING AND FINANCE

Declaration

This is to certify that the thesis prepared by TAYE KIDANE ANGELO, entitled: "Determinants of Bank Lending Rates: Empirical Study on Private Commercial Banks in Ethiopia" and submitted in partial fulfillment of the requirements for the degree of Master of accounting and finance in Finance complies with the regulations of the university and meets the accepted standards with respect to originality and quality.

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List of Acronyms

AIB	Awash International Bank
BOA	Bank of Abyssinia
BS	Bank size
CAR	Capital Adequacy Ratio
CC	Correlation Coefficient
CBO	Cooperative Bank of Oromia
CLRM	Classical Linear Regression Model
DB	Dashen Bank
DW	Durbin-Watson DIR:
DIR	Deposit interest rate
FEM	Fixed Effect Model
GDP	Gross domestic Product
INF	General Inflation rate
JB	Jarque-Bera
IR	Interest rate
LIR	lending interest rate
LR	Liquidity ratio
LIB	Lion International Bank
LOA	Loan and advance
MoFEC	Ministry of Finance and Economic Cooperation
NBE	National Bank of Ethiopia
NIB	Nib international Bank
NPL	Nonperforming loan ratio
OLS	Ordinary Least Square
OCTA	operating cost to total assets ratio
REM	Random Effect Model
ROE	Return on Equity
UB	United Bank
VD	Volume of deposit
WB	Wogagen Bank

Abstract

The aim of this study is to investigate the determinants of lending interest rate of private commercial banks in Ethiopia. The study used balanced panel model in examining the regression model and collect data from eight private commercial banks covering the period of ten (10) consecutive years, 2008-2017 with a total of 80 observations. To this end, the study employed a quantitative research approach by documentary analysis based on their audited financial statement. The study used panel data techniques specifically fixed effect model on the regression analysis and used E-view8 software. This study has used 'lending interest rate' as dependent variable, while: deposit rate, bank size, liquidity ratio, operating cost to total asset ratio, profitability, market concentration, and inflation rates are explanatory variables. The estimated regression results reveal that the liquidity ratio, profitability ratio and bank size had significant and negative effect on lending interest rate. Deposit rate, operating cost to total asset ratio, market concentration has positive and statistically significant effect on lending interest rate. Inflation rate has positive and statistically insignificant effect on lending interest rate of Ethiopian private commercial banks. The study recommends to Private commercial banks should manage their internal inefficiencies; from the regression result operating cost to total asset ratio and lending interest rate positive relationship in private commercial banks of Ethiopia. This result is justified as high operating costs are likely to include costs due to inefficiency leading to higher lending interest rate. The private commercial banks should give more attention in reduction of operating cost, to improve its efficiency of banks' intermediation, by using advanced technologies. The Study also recommends to policy makers the Competition in the banking sector should be further enhanced and supported by policies that encourage and foster competition in the banking sector. Measures to promote the growth and image of small and medium sized banks, in an effort to increase their ability to penetrate markets and break dominance by few large banks.

Key words: *lending, lending interest rates, private commercial banks, determinants*

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The banking sector plays a fundamental role in economic growth, as it is the basic element in the channeling of funds from lenders to borrowers. Efficient financial intermediation is an important factor in economic development process as it has implication for effective mobilization of investible resources. Consequently, banking sector efficiency plays significant role in an economy (Asmare, 2014).The banking system is a key pillar in any economy, bearing in mind its basic function to reallocate funds from agents with a surplus to those with a deficit. By solving the problem of information asymmetry among agents and by diversifying risks, banks manage to decrease the costs of the exchange of financial funds and enable their efficient allocation within the economy(Georgievska et al.,2010).

The role of credit is considered to be the key to economic growth and financial stability of the economy. Credit is the aggregate amount of funds provided by commercial banks to individuals, business organizations and government. Commercial banks perform the act of financial intermediation that collect money from the surplus sector in the form of deposits and lend it to various sectors of the economy(Andrew,2004).Credit usually represents the bulk of the institution's assets, while interest on the credit represents the major source of income. Loans involve a high degree of risk and have profound impact on the bank's profitability, liquidity and solvency. The quality of a bank's credit points to the soundness and stability of the bank and the risk borne by the depositors and creditors. Poor management of loan portfolio is the major cause of liquidity crises and bank's failures around the world (Neelam, 2014).

Lending behavior of bank generally depends on type of bank, the capital base, the deposit base, density of the deposit, interest rate, exchange rate, inflation, gross domestic product, investment portfolio, liquidity, monetary and fiscal phenomena, the credit guidelines issued from time to time by the regulatory authority and internal policies of the banks (Olusanyaet.al ,2012).Lending which may be on short, medium or long-term basis is one of the services that commercial banks do render to their customers. In other words, banks do grant loans and advance to individuals;

business organizations as well as government in order to enable them embark on investment and development activities as a means of aiding their growth in particular or contributing toward the economic development of a country in general. Thus, banks lending activities generate economic growth through resources provision for real investment, as indicated by (Amano, 2014).

Lending Interest rate is important terms in the lending decision process of commercial banks (Aliduu, 2017).Commercial banks are independent business entities that set their own lending rates (NBE/INT/11/2010). The lending interest rate is the percentage of the loan amount that the lender charges to lend money. When banks' lend money to customers, interest is charged on it for a number of reasons, including value preservation, compensation for risk, and profits among others. Lending is important to encourage and stimulate economic investments, leading to increased productivity, employment and national income. Businesses investments in building, machinery, equipment's, new factories and other assets are stimulated when lending rate decreased (Baumol and Blinder, 2010).

Commercial banks can increase their profit margins through higher lending rates and lower deposit rates. Banks do not charge loan rates that are too low because the revenue from the interest income will not be enough to cover the cost of deposits, general expenses and the loss of revenue from non-performing loan portfolio. On the other hand, they cannot charge too high loan rates because they will not be able to keep the banking relationship with the borrowers with high lending interest rate (Bhattarai, 2015).

Thus, determination of the appropriate lending rates usually becomes a major issue in banking industry. Moreover, the factors that determine the level of commercial banks' lending rates are important concerns for specific banks, macroeconomic and bank industry to policy makers (Branko K, 2014).As indicated by Nasrin et al.(2015) high lending rates to the riskiness of borrowers which may result in the problem of moral hazard and adverse selection. Farther he argue that push lending rates high include low quality of loan portfolio, lack of competition in the financial markets, low levels of savings, uncertainty in the business environment, institutional constraints and more importantly profitability of the bank. As indicated by Zuzana (2002) the level of interest margins in developing economies persistently higher than in developed economies. Claeys and Vander (2008) attribute those differences to low efficiency and low degree of market competition. Policy makers should adjust to the interest rate, banks

may actually adjust their lending rates asymmetrically; that is, there may be a tendency for them to raise their lending rates much more rapidly when market interest rates are rising, as compared to the speed at which they are prepared to lower their lending rates when the market rate is declining (Diebold and Sharpe, 1990).

Lending interest rate of commercial banks influenced by a number of factors such as specific to the banking sector/industry, individual bank-specific factors and macroeconomic factors (Bhattarai, 2015). The classical theory argues that the rate of interest is determined by two forces. Firstly the supplies of savings, derived mainly from households, and second the demand for investable capital, coming mainly from the business sector. Moreover, the loanable funds theory considers the rate of interest as the function of four variables: savings, investment, the desire to hoard money and supply of money. Rational expectation theory posits that the best estimation for future interest rates is the current spot rate and that changes in interest rates are primarily due to unexpected information and or changes in economic factors (Irungu,2013).The determination of bank lending interest rate use variables that basically fall in three categories: (i) individual bank-specific factors such as operating or administrative costs, non-performing loans, return on assets, bank size, capital adequacy, bank liquidity, among others; (ii) factors specific to the banking sector/industry such as the degree of competition or market concentration, regulatory requirements such as statutory reserve requirements or regulated minimum deposit rates and,(iii) macroeconomic indicators which include real gross domestic product (GDP) growth rate and inflationrate(Bhattarai,2015;Gambacorta,2004;Cihak,2004;Adoah,2015).These Researchers on the determinants of lending rate was initially directed in developed and emerging countries. Some of these studies focus on one category of factors while others consider two factors.

The lending interest rate indicates the cost of borrowing funds from banks for business; this makes it critical for the expansion of economic activity in a country. While it is evident that the lending rate is crucial for the progress and development of all types of entrepreneurial activities, the most important thing is to distinguish the determinants of the lending rate in an established and integrated banking sector regulated by a central bank (Ali et al., 2011).

According to directive No.NBE/INT/11/2010, Lending interest rates percent per annual to be freely determined by each bank. And the commercial banks were allowed too freely quote their own bank lending rate based on a standardized formula, which takes the funding cost into

account. The standardized formula is matched to ensure that the bank lending rate will move in synchronization with market conditions. A further benefit of the bank lending rate is that it would be reflective of both movements in cost of funds and lending rates.

The variation in lending rate is a matter of great concern to all the major stakeholders in the economy (Ali et al., 2016). In recent times the high lending rate charged by commercial banks has raised many questions for the policy makers. The lending rate indicates the cost of borrowing funds from banks for business; this makes it critical for the expansion of economic activity in a country. While it is evident that the lending rate is crucial for the progress and development of all types of entrepreneurial activities, the most important thing is to distinguish the determinants of the lending rate in an established and integrated banking sector regulated by a central bank (Aliet al., 2016).

According to national bank of Ethiopia report2017, lending interest rates in Ethiopia is not stable as it fluctuates depending on the average bank lending Rate. In 2008, average lending interest rate was 11.50 % while a maximum lending interest rate was 15%, in 2009 average lending interest rate was 11.88% while a maximum lending interest rate was 14%, and in 2010 average lending interest rate was 12.25% while a maximum lending interest rate was 16.50% and in 2011 average lending interest rate was 11.88% while a maximum lending interest rate was 16.25% and in 2017 average lending interest rate was 12.70% while a maximum lending interest rate was 18%. This fluctuation is its own effect on inflation and economic growth rate. Banking industry in Ethiopia is still growing and it should ensure that effective strategies are put in place to lending interest rate. Moreover, the interest rates charged on loan by commercial banks have been a sensitive and recurring policy issue in Ethiopia and one which requires an objective examination of all the factors that influence commercial banks' lending interest rates.

Therefore, the main purpose of this study is to analyze the financial data of Ethiopian commercial banks, annual reports of NBE and Ministry of Finance and Economic Cooperation (MOFEC) for fiscal year from 2008 to 2017 in order to investigate the determinants of bank's lending rate and analyze their significance and impact on dependent variable by categorizing the variables in to internal bank specific factors and external macroeconomic variables and industry specific factors.

This study is the first empirical analysis to investigate the determinants of lending rates in Ethiopia private commercial banks. The objective of this study is to investigate factors that influence lending interest rates in private commercial banks in Ethiopian.

1.2 Banking industry in Ethiopia

As a result of the agreement reached between Emperor MinilikII and Mr. MaGillivray, representative of the British owned National Bank of Egypt; modern banking in Ethiopia began in 1905 with the Bank of Abyssinia, a private company controlled by the Bank of Egypt In 1931. It was liquidated and replaced by the Bank of Ethiopia which was the bank of issue until the Italian invasion of 1936. During the Italian occupation, Bank of Italy bank notes formed the legal tender. Under the subsequent British occupation, Ethiopia was briefly a part of the East Africa Currency Board. In 1943, the State Bank of Ethiopia was established, with two departments performing the separate functions of an issuing bank and a commercial bank. In 1963, these functions were formally separated and the National Bank of Ethiopia (the central and issuing bank) and the Commercial Bank of Ethiopia were formed. In the period to 1974, several other financial institutions emerged including the state owned: The Agricultural and Industrial Development Bank (established largely to finance state owned enterprises); The Savings and Mortgage Corporation of Ethiopia; The Imperial Savings and Home Ownership Public Association (which provided savings and loan services). Major private commercial institutions, many of which were foreign owned, included the Addis Ababa Bank, the Banco di Napoli and the Banco di Roma.

However, the banking business could not move further because of the nationalization of private investments by the Socialist regime (the Dergue regime) that came into power leaving only three government banks; the National Bank of Ethiopia, the Commercial Bank of Ethiopia and agricultural and Industrial Development Bank. This was reversed when the Socialist regime was overthrown in 1991. Following the overthrown of the Dergue regime in 1991, the EPRDF declared a liberal economic system. In line with this, Monetary and Banking proclamation of 1994 established the National Bank of Ethiopia (NBE) as a judicial entity, separated from the government and outlined its main function. Monetary and Banking proclamation No.83/1994 and the Licensing and Supervision of Banking Business No.84/1994 laid down the legal basis for

investment in the banking sector (www.nbe.gov.com). After the proclamation of 1994, the first private bank, Awash International Bank was established in 1994 by 486 shareholders paving a way to the establishment of related private banks such as Dashen Bank (1995), Abyssinia Bank (1996),Wgegan Bank (1997), United Bank (1998), Nib International Bank (1999), Cooperative Bank of Oromia (2004), Lion International Bank (2006), Oromia International bank (2008),Zemen Bank (2009), Buna International Bank (2009), Birhan International Bank (2010), Abay Bank S.C. (2010), Addis international Bank SC. (2011), Debub Global Bank S.C. (2012), Enat Bank S.C. (2013) establishment.

Currently Ethiopia's banking industry is fast growing as evidenced by the number of banks started up in the last two decades, since liberalization in the country. Ethiopia opened the gates of banking to private natives only in 1994, and the number of banks operating in the country in the fiscal year In 2015/16 the number of banks declined to 18 from 19 due to the merger of Construction & Business Bank with Commercial Bank of Ethiopia. Of the 18 banks 16 were private and 2 public. Banks opened 494 new branches in 2015/16 (of which 363 were private) raising the total branch network to reach 3187 from 2693 last year. As a result, bank branch to population ratio declined from 1:33,448 people to 1:28,932 in 2015/16.However, the high people to bank branch ratio indicated that Ethiopia still remains as one of the under banked economies even by Sub-Saharan African (SSA) countries standards. Both public owned and private banks which are operating currently in the country are listed in the Following table 1.

Table 1.1: List of commercial banks operating in Ethiopia

No.	Name of banks	Year of Establishment	ownership
1	Commercial Bank of Ethiopia (CBE)	1963	Public
2	Development Bank of Ethiopia (DBE)	1909	Public
3	Awash International Bank S.C (AIB)	1994	Private
4	Dashen Bank S.C (DB)	1995	Private
5	Bank of Abyssinia S.C (BOA)	1996	Private
6	Wegagen Bank S.C (WB)	1997	Private
7	United Bank S.C (UB)	1998	Private
8	Nib International Bank S.C (NIB)	1999	Private
9	Cooperative Bank of Oromia S.C (CBO)	2005	Private
10	Lion International Bank S.C (LIB)	2006	Private
11	Oromia International Bank S.C (OIB)	2008	Private
12	Zemen Bank S.C (ZB)	2009	Private
13	Bunna International Bank S.C (BIB)	2009	Private
14	Berhan International Bank S.C (BBI)	2010	Private
15	Abay Bank S.C. (AB)	2010	Private
16	Addis international Bank SC. (AdIB)	2011	Private
17	Debub Global Bank S.C. (DGB)	2012	Private
18	Enat Bank S.C. (EB)	2013	Private

Source: National Bank of Ethiopia 2016/17 annual report

1.3 Statements of the problem

The banking industry is one critical component of the financial system in developing countries capable of facilitating capital accumulation and economic processes. This is possible through efficient financial intermediation (Diamond and Rajan, 2001). The banks mobilize funds from the surplus spending units in order to bring financial costs down. This transformational process of banks activity is at best influenced by a host of factors, namely, macroeconomic, bank level (Peek and Rosen green, 1995) and industry level characteristics (Boot,2011).

Lending interest rate is the cost of borrowing for the peoples who take loan from the banks and deposit rate is the reward or gain for the depositors for lending money. Both rates are determined by banks. Banks do not charge loan rates that are too low because the revenue from the interest income will not be enough to cover the cost of deposits, general expenses and the loss of revenue from non-performing loan portfolio. On the other hand, they cannot charge too high loan rates because they will not be able to keep the banking relationship with the borrowers with high lending interest rate. Thus, determination of the appropriate lending interest rates usually

becomes a major issue in banking industry. Moreover, the factors that determine the level of commercial banks' lending interest rates are important concerns for specific banks, macroeconomic and bank industry to policy makers (Bhattarai, 2015).

Low lending interest rates encourage borrowing for both businesses and households. Low lending interest rates encourage and stimulate economic investments, leading to increased productivity, employment and national income (Baumol and Blinder, 2010).The lending interest rate indicates the cost of borrowing funds from banks for business; this makes it critical for the expansion of economic activity in a country (Ali et al.,2016).

The report of NBE 2017 lending interest rates in Ethiopia is not stable as it fluctuates. While it is evident that the lending interest rate is crucial for the progress and development of all types of entrepreneurial activities, the most important thing is to distinguish the determinants of the lending interest rate in an established and integrated banking sector regulated by a national bank. Lending represents the heart of the banking industry and economic growth of the country (Amano, 2014).In connection with research studies that have been conducted on determinants of lending interest rate, there are exhaustive studies that examined this issue in different level of economies. In developed economies Georgievska et al.,(2010),Gambacorta (2004),Arifi et al., (2014) and Cihak,(2004). In emerging economies Barajaset et al., (1998),Alietal,(2016) Mbao et al., (2014), Yuga,(2015) and Farhan et al.,(2012). In developing and sub Saharan African countries, Adoah (2015),Kinyuru(2011),Mahmud Ahmed(2016),Ngigi (2014),Saba et al.,(2012),Ngumi (2014),Gordon(2018), Richard and Okoye (2014), Samuel(2018), Uzeru (2012) and Olusanya (2012) they conducted their studies on determinants of lending interest rate.

While, we see in Ethiopia there is no any empirical study conducted on this issue to the knowledge of the researcher. Generally the studies conducted in developed, emerging, developing and Sub-Saharan African countries found bank industry, macroeconomic and bank specific factors that affect lending interest rate of commercial banks, but it depict variation in results since, and countries differ each other by their economic, financial regulatory and operating environments.

However, there are no universally accepted findings to the determinants of lending interest rate; Forexample the study conducted by Bhattarai(2015) the determinants of bank lending rates in

Ghana. The findings of this study revealed that bank size, market competition have a positive relationship with lending rate is inconsistent with Georgievska et al.(2010) the determinants of lending interest rates in the commercial banking sector in Greece. The findings of this study, shows that bank size and a market competition have a negative effect with lending interest rate.

Cihak (2004) study sought to investigate the factors influencing lending interest rates in Croatia from 1999 to 2003. The result of the study indicated that deposit rates has a positive effect on lending interest rates is inconsistent with Ali et al., (2016) the study examines potential inner factors of the lending interest rate in the commercial banking sector in Pakistan. The findings of this study revealed that deposit rate has a significant and negatively relationship with lending interest rate.

Bhattarai (2015) investigate the determinants of lending interest rates in the universal banks in Ghana. The result shows that bank size, having a significant and positive on the commercial bank lending interest rates is inconsistent with Georgievska et al., (2010) the determinants of lending interest rates in the commercial banking sector in Greece. The findings of this study revealed that that bank size has a significant and negative impact on the commercial bank lending interest rate.

Cihak (2004) investigated the factors influencing lending interest rates in Croatia from 1999 to 2003. The result of the study indicated that liquidity ratio have a negative effect on lending interest rates is inconsistent with Ali et al.,(2016) the study examines potential inner factors of the lending interest rate in the commercial banking sector in Pakistan. The findings of this study revealed that liquidity ratio have a significant and positively relationship with lending interest rate.

Therefore, further empirical evidence could provide additional insight about the determinants of lending interest rate by using much recent dataset, and it needs further investigation in Ethiopian context. To the knowledge of the researcher there is no empirical studies done regarding determinants of lending interest rate private commercial bank in Ethiopia and the related study in Ethiopia focused on bank performance, profitability and bank lending behavior rather than determinants lending interest rate. Therefore this paper is designed to fill the knowledge gap by investigating bank specific, industry specific and Macroeconomic factors that could possibly affects the variability of lending interest rate of Ethiopian private

commercial Banks.

1.4 Objectives of the Study

In the framework of the problems highlighted above, the study has the following general and specific objectives

1.4.1 General objective

The general objective of the study is to investigate the determinants of lending interest rates of private commercial banks in Ethiopia.

1.4.2. Specific objectives

Having the aforementioned problem and general objective in mind, the researcher addressed the following specific research objectives:

1. To examine the effect of deposit rate on Banks' lending interest rate
2. To examine the effect of bank size on Banks' lending interest rate
3. To examine the effect of liquidity ratio on Banks' lending interest rate
4. To identify and analyze the impact of profitability ratio on Banks' lending interest rate
5. To examine the effect operating cost to total assets ratio on Banks' lending interest rate
6. To identify the impact of market concentration on Banks' lending interest rate
7. To assess the impact of inflation rate on Banks' lending interest rate

1.5 Hypothesis

In order to attain the aforementioned broad objectives, the following seven hypotheses are devised.

H1: deposit rate has positive and significant effect on Banks' lending interest rate.

H2: bank size has negative and significant effect on banks' lending interest rate.

H3: liquidity ratio has negative and significant effect on Banks' lending interest rate.

H4: profitability ratio has negative and significant effect on Banks' lending interest rate.

H5: operating cost to total assets ratio has positive and significant effect on banks' lending rate.

H6: market concentration has positive and significant effect on lending interest rate.

H7**:** inflation rate has positive and significant effect on lending interest rate.

1.6 Scope (delimitation) of the Study

This research mainly concentrated on determinants of private commercial banks lending interest rate in Ethiopian and made the analysis using secondary source of data. The study had taken in to account the performance of banks for the last 10 years that is from 2007/2008 to 2017. As a

result, the research included Ethiopian private commercial banks that started their operation before 2008, which are 8 private commercial banks who operate in Ethiopia. Those banks are awash bank, Dashen bank, Bank of Abyssinia,Wegagen bank, united bank, Nib International Bank, Cooperative Bank of Oromia and Lion International Bank those are fully operated from the year 2008 to 2017. The data required for defining internal & external factors were limited to 10 years (2008-2017).The balance sheet and profit and loss statements of eight Ethiopian private commercial banks data were collected from NBE. In addition, the study used bank sector data and countrywide macroeconomic data that were driven from National Bank of Ethiopia and MoFEC. The study used lending interest rate as dependent variables and deposit rate, bank size, liquidity ratio, profitability ratio, operating cost to total asset ratio, market concentrationand inflation rate were taken as explanatory variables. These variables could explain the topic properly by referring previous empirical works.

1.7 Significance of the Study

As indicated in Kothari (2004) beside used as integral tool to facilitate the decisions of the policymaker 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 work. Banks are one of the contributors of a country's growth through lending money to investors and the business community. Lending also has important function for commercial banks. Its contribution to asset and income portfolio is very high in banking industry. Therefore, understanding the determinants of lending rate will help them enhance bank performance. Moreover, the results of this research used a great benefit to the academia by adding to a body of knowledge, regulatory authorities of commercial banks and policy makers, which constitute the focus of the research. In addition, it will serve as a base for policymakers such as National Bank of Ethiopia. It also enables investors and customers to have information on status of their banks. It also provides basic information for future researchers in the sector.

1.8 Structure of the study

This study will mainly focus on the identification of both the internal (bank-specific factors) and the external factors which includes the industry-specific factors as well as the broader macro-economic factors that can affect the lending rate of privately owned commercial banks in

Ethiopia. This study is organized into five chapters. Introduction of the study with respect to Problem statement and objective of the study are presented in chapter one. Chapter two presents literature review of the study. In this chapter both the theoretical and empirical reviews pertaining to the determinants of lending interest rate are discussed. Research approach and methodology are presented under chapter three. Chapter four describes in detail the descriptive statistics, CLRM assumption and regression analysis found in the study. Finally, chapter five presents the conclusions and recommendations.

CHAPTER TWO

LITERATUREREVIEW

Under this chapter the theoretical and empirical evidences focusing on the determinants of bank lending interest rate are presented. Therefore, the literature review is organized and presented in two sections. The first section discusses determinants of private commercial banks lending rate by taking into account the theoretical and empirical studies conducted in the area. Finally, driven conclusion based on reviewed related literatures and briefly discussed knowledge gap in the relevant literatures.

2.1. Theoretical and Conceptual literature review

Financial institutions, which are composed of banks, micro-finances, and insurances, have comprehensive roles in serving the needs of the society within the economy. The service is rendered through providing three major financial functions namely: intermediation or allocation, operational and payment systems (Berhanu, 2015). Operational and allocation functions are the provisions of financial resources to meet borrowing needs of individuals and other economic agents. The main microeconomic function of banks is the provision of facilities to collect deposits and invest these deposits as credits.

Commercial banks are the most important savings mobilization and financial resource allocation institutions. Consequently, these roles make them an important phenomenon in economic growth and development. Lending practices in the world could be traced to the period of industrial revolution which increases the pace of commercial and production activities thereby bringing about the need for large capital outlays for projects. Many captains of industry at this period were unable to meet up with the sudden upturn in the financial requirements and therefore turn to the banks for assistance. Similarly, in the contemporary period this function constitutes the major share among the functions of commercial banks. Thus, lending which may be on short, medium or long-term basis is one of the services that commercial banks do render to their customers (Folawewo and Tennant, 2008).

Banks play significant role in economic growth, price and financial stability. Banks accept customer deposits and use those funds to loans to other customers or invest in other assets that

will yield a return higher than the amount bank pays the depositor (McCarthy et al., 2010). If banks are effective, efficient and disciplined, it brings about rapid growth in the various sectors of the economy as well as brings economic stability. For the survival of banks, effective lending is crucial. The principal profit-making activity of commercial banks is making loans to its customers. In the allocation of funds to earn the loan portfolio, the primary objective of bank management is to earn income while serving the credit needs of its community. Lending represents the heart of the industry. Loans are the dominant asset and represent 50-75 percent to total amount at most banks, generate the largest share of operating income and represent the banks greater risk exposure (Mac Donald and Koch, 2006). Bank credit contributes to economic growth in several ways. For example, credit is an important link in money transmission; it finances production, consumption, and capital formation, which in turn affect economic activity.

As bank lending is the major source of generating earnings and it involves remarkable amount of risk, banks should be careful in analyzing the various determinants of bank lending behavior. To lend with the objectives of generating appropriate, sustainable profit, maintaining liquidity and ensuring safety, banks require a high degree of practical policy formulation and application. Banks mostly transform liquid assets like deposits into illiquid assets like loans (Diamond and Rajan, 1998). This transformational process of banks activity is at best influenced by a host of factors, namely, macroeconomic, bank level (Peek and Rosengreen,1995) and industry level characteristics (Boot and Thakor,2000).

2.2. Theoretical framework

2.2.1. Loanable Funds Theory

The Loanable Funds theory originated in the 1930s and propounded by Dennis Robertson and Bertil Ohlin, but the theory is also attributed to Stockholm School. Its origin is not solidly known, however its applicability has been accepted by many researchers. The theory explains how real interest rates are determined. It is backed by the notion that individuals decide between consuming now and consuming in the future. The theory stipulates that the rate of interest is determined by the demand and supply of loanable funds in the capital market. According to this theory, savings and investments are responsible for the determination of the rates of interest in the long run while short term interest rates are determined by the financial conditions prevailing in an economy. The determination of interest rates according to loanable funds theory depends

on the availability of loanable amounts. The availability of such loan amounts is based on factors like the net increase in currency deposits, the amount of savings done, willingness to enhance cash balances and opportunities for the formation of fresh capitals.

Bibow (2000), Claeys and Vander (2008) argue that the theory explains factors that influence lending rates in that if individuals do not save in banks due to low interest rates offered on deposits due to poor financial intermediation as a result of inefficiencies in banking, there will be low deposits from which banks will lend from and thus high lending rates. In loanable funds theory, the demand of loanable funds originates from domestic business, consumer, government and foreign borrowers. Banks have to establish the credit worthiness of borrowers to minimize the default risk. Banks will charge a higher premium for business or individuals who are rated to have a high risk supply of funds is generated from savings and money creation in the banking systems and foreign lending. The sectors in which banks concentrate determine the availability of loanable funds (IBM, 2010).

Demand and supply of loanable funds determines the nominal rate of interest. Holding supply of loanable funds constant, an increase in the demand for loanable funds would lead to a rise in the interest rate and a decrease in demand would lead to a fall in interest rates. If the supply of loanable funds increases the result would be a fall in the rate of interest. If both the demand and supply of loanable funds change, the resultant interest rate would be determined much by the magnitude and direction of movement of the demand and supply of loanable funds. The demand of final goods and services creates a demand for loanable funds (Abdul, 2018).

2.2.2. Rational Theory of Interest Rate

The rational expectation theory of interest rate captures the idea that people make economic decisions based on available information, past experiences and expectations. According to Razzak(1997) the Rational Theory is built on the evidence that capital and money markets function efficiently in assimilating available information that is likely to affect interest rates and prices of assets. Individuals are able to form unbiased and rational expectations about future demand and supply of credit and interest rates. Thus the best predictor of future interest rates is the current interest rate, and changes in interest rates can also be attributed to unexpected information as well as perceived economic factors. Interest rates will be close to equilibrium

levels if the capital and money markets function efficiently. Thus the rate of interest is likely to change only when economic agents are exposed to entirely new and unpredicted information. So if they expect interest rate to rise, demand for funds will fall even when the banks are willing to give loans out. And on the other hand demand for funds could increase if they perceive interest rates to fall (Bekaert, 1998).

2.2.3 Credit Market Theory

A model of the neoclassical credit market postulates that the terms of credits clear the market. The theory postulates that if collateral and other pertinent restrictions remain given, then it is only the lending rate that determines the amount of credit that is dispensed by the banking sector. The model credit market theory postulates that the terms of credits clear the market. In a market where collateral and other restrictions remain unchanged, then lending rate becomes the only price mechanism (Ewert et al, 2000).Given an increasing demand for credit and a given credit supply, the lending rates rises and if the demand lowers thus higher supply of credit, lending rates decline. Any incremental risk in a project being undertaken is reflected through a risk premium. Therefore, there exist a positive correlation between the probability of default and the lending rate charged on a loan. Thus a conclusion is made that the higher the risks failure of the borrower, the higher the interest premium (Ewert et al, 2000).

The theory creates an impression that a borrower who has a high risk will require to provide more collateral so as to be charged the same lending rate as a borrower who has a low risk profile as he will enjoy a low risk premium. This brings the “moral hazard’’ and adverse selection phenomena brought about by information asymmetry existing between the lender and the borrowers (Mason and Roger, 1998). The borrower has a more accurate assessment of the risk profile of his investment that’s not known by the lender and hence may perform secret actions to increase the risk of the investment without the realization of the lender. The adverse selection problem comes forth when lenders raise lending rates to shield themselves from default and on the other hand attract high risk borrowers and eliminate low risk borrowers (Mason and Roger, 1998).This study aims at establishing the effect of credit information sharing on the adverse selection problem thus average lending rate.

2.3. Commercial Banks

Banks are major financial institutions play an important role by transferring fund from surplus unit to deficit unit in the economy. Bank means accompany licensed by the national bank to undertake a banking business or bank owned by the government. Banking business such as: receiving fund form the public via a means that the national bank has declared to be an authorized manner of receiving fund, using the fund received the whole or in part for the account and at the risk of the person undertaking the banking business for loan or in the manner acceptable by the national bank, buying and selling of gold and silver bullion and foreign exchange, transfer fund to other local and foreign person on behalf of the bank themselves or their customers, discounting and negotiation of promissory note, draft, bill of exchange and other evidence of debt, any activities recognized as customer banking business (NBE, 2008). The definition points out those commercial banks are doing a business of finance. It does by collecting deposits on one side and makes the loan using the collected finance in another side. These are two main activities of a commercial bank can be conceptualized as shown below:

Figure 2.1: Commercial Bank Conceptual Framework

Source: researcher compilation from literatures

Where: SU= Surplus unit

DU= Deficit unit

n = is 1, 2, 3....., representing either depositors or lenders Total deposit (TD) is expressed as:

TD=SU1 + SU2 +SU3 +……SUN

Total loan (TL) is expressed as:

TL = DU1 + DU2 + DU3……..DUN

For efficient banking sector, the total loan (TL) demanded by the lenders is equal to the amount of total deposits (TD). This point is called market equilibrium of the banking sector. At equilibrium point, the profit (spread) is zero since the lending rate and deposit rate is very close as explained in the illustration below for Market and Bank Equilibriums and Efficient Bank Intermediation which is assuming two intermediation services that are mobilizing deposit and lending (Tesfaye, 2018).

Generally, interest rate spread is measured by the difference between lending rates and deposits rate. The concept can be expressed mathematically as follows;

Interest Rate Spread = Lending Rate − Deposit Rate…… (Asmare, 2014)

From the equation above, the concept may look simple. However, important to note is that banks offer a variety of financial products, with different rates and different maturity period. There exist personal loans, mortgages, housing loans, staff loans among others. Even if, the type of financial product is the same, lending rates still may differ depending on the credit ratings of the client. This study to be of worthwhile, will concentrate its analysis on those rates offered to a group of creditworthiness clients whose probability of default is lowest. The deposit rate refers to the rate awarded to savings account holders (Arshad, 2011).

The methods used to measure Interest Rate Spread by many studies as;

Interest Rate Spread= Interest earned on loans/Average Loans - Interest paid on loan/Average Deposits

Lending Rate= Interest earned on loans/Average Loans and advance…….. (Asmare, 2014, Wellington, 2016, Bonga, 2016)

Deposit rate = Interest paid on loan/Average Deposits or

Deposit rate is measured as the ratio of interest expense to total deposit

From the above definition Lending Rate is measured by Interest income/Average Loans in this research.

2.4. Commercial bank lending

Gem mill and Thomas (2004) financial institutions offering commercial bank lending primarily service the needs of corporations and large businesses. Also known as business banking, commercial banks are not only banks but intermediate business between banks and other financial institutions unlike retail banking which provides services directly to consumers. These high-end institutions fund corporations, sole proprietorships and partnerships on many levels from large businesses to overseas companies in a variety of nations and include many different services from mortgage lending to supplying international capital to low and middle-income countries.

Commercial loans, often called business or industrial loans, can be used for land, to purchase buildings, or purchase capital and equipment to use for manufacturing, distribution, wholesale, transportation, communication and much more. Although still a form of debt, these loans are not available for items such as investments or personal expenses (Folawewo and Tennant, 2008). Companies often choose a revolving line of credit to purchase materials or merchandise and repay the debt as merchandise sells. Credit is extended as it is paid off, much like a credit card, and can be used for replacing equipment or restructuring buildings. Farmers can also take advantage of commercial bank lending to expand their agricultural farms and purchase much-needed equipment.

Peter (2010), in his study examined the real interest rate decreases with inflation. In other words, the interest rate increases less than the increase in inflation and he shows economic stability. If the production function exhibits decreasing returns to scale, then the marginal productivity of the capital stock decreases with higher capital stock and lowers interest rates. Firstly, as the financial market is expected to be the transmission channel for the framework, a policy rate that is linked to the interbank rate or overnight rate may not have the desired effects on interest rates in the economy, as it will have no bearing on the banks' cost of funds.

2.5. Commercial bank lending interest Rate

Lending interest rate means the cost of borrowing for the peoples who take loan from the banks. Low lending rates encourage and stimulate economic investments, leading to increased productivity, employment and national income. Businesses investments in building, machinery, equipment's, new factories and other assets are stimulated when lending rate decreased. This is

because lending rates that must be paid on borrowing is a key element of the cost of making an investment. Therefore, investors or business executives, Government will find investment prospects more attractive as lending rates decreased (Baumol and Blinder, 2000). Interest rate is a percentage charged for use of borrowed money. It is the opportunity cost of money.

As indicated by Simon (2015), defines the rate of interest as a payment from borrowers (deficit units) to lenders (surplus units) which compensates the savers to lenders for parting with their funds for a definite period of time usually expressed in days, months or years and at some risk. As indicated by Ngugi, (2013), states that the primary role of interest rate is to assist in the mobilization of financial resources and ensure efficient and proper use of resources in the furtherance and elevation of economic growth and development.

Therefore, interest rates include the rates paid for deposits (deposit rate) and the rates applied on loans to deficit units (lending rate) for a given period of time. Deposit rates include savings, call and time deposit rates whereas lending rates comprise of rates charged on overdrafts (overnight borrowings) and term loans otherwise known as long-term borrowing.

The rate of interest plays a big role in the financial system of a country through the allocation of resources in the economy. The rates have the capability to play the intermediary role between potential lenders and borrowers (Kinyua, 2000). A high interest rate on deposits acts as an incentive for savers to part with their money and keep it with deposit taking institutions instead of putting the money in other different investment opportunities. A high rate of interest on lending for borrowers translate to high borrowing costs which discourages potential borrowers due to the fact that it leads to high production costs which have a negative effect on returns (Kinyua, 2000). This means that a balance has to be maintained for purposes of economic development in terms of investment. The rate of deposit has to be high in order to entice deposits which form part of the resources for lending while the lending rate has to be favorably low so as to attract borrowing for investment. As the levels of interest rates increase, the level of loan accessibility by this target group decreases, and vice versa. Financial institutions are working hard to make their presence felt in the rural areas as was evidenced by the high rate of ownership of bank accounts by respondents in the area (Mathea, 2014)

Bankers have experienced numerous frustrations in their attempt to recover loans whose

performance is in arrears through the judicial proceedings. This leads to the incurrence additional expenses by the bank in lengthy litigation procedures. These costs form part of interest rates to be charged. The Study conducted by Kinyuru (2011), states that a substantial increase in government borrowing in order to finance current spending will push up interest rates if there is no parallel increase in savings by private sector. This occurs even with stationary inflation rate.

The real interest rate is an interest rate harmonized with either realized or expected inflation rate is the relative price of consuming now rather than later. As such, it is a key variable in vital theoretical models employed in finance as well as in microeconomics- such as the consumption based asset pricing model (Lucas, 1978). According to Keynes (1936), interest rate represents the cost of borrowing capital for a given period of time. Due to the fact that borrowing is a significant source of finance for many firms, prevailing interest rates are of much concern to the firms due to the indexing of interest rate on borrowing arrangements of the firms ultimately affecting growth.

A study also conducted by Kinyuru(2011) investigates the impact of variations in market interest rates on banking institutions' profitability is ambiguous; it largely depends on the degree of responses of asset and liability rates. In general, since both sides of commercial bank's balance sheets are affected by market interest rates in a Parallel fashion, the net impact on microfinance institutions' profitability can be deduced by tracing the responses of both assets and liabilities as market interest rates change. Commercial banks activities greatly rely on their intermediation services, filling the gap between suppliers and demanders of funds. Their profitability is partly due to the difference in interest rates charged on loans and what is paid to suppliers of funds. The larger the spread between loan and deposit rates, the more likely the necessary condition for intermediation to occur can be met. Earlier explanations that allow positive spread to be maintained rest on the ability of commercial institutions to minimize transaction costs in loans originating through their intermediation services.

2.6. Trend Analysis of Average Lending Rate in Ethiopia 2008-2017

This analysis establishes a pattern for lending rate of commercial banks operating in Ethiopia during the study period consideration from 2008 to 2017 by taking an average lending rate from NBE report. Accordingly, the following figure provides a pictorial presentation of lending rate on which the level of lending rate is presented on Y axis and time is represented on X axis. Average Lending rate was measured by taking of commercial banks maximum and minimum lending rate which is selected in the study for each year and lending interest rates in Ethiopia is not stable as it fluctuates depending on the average bank lending Rate.

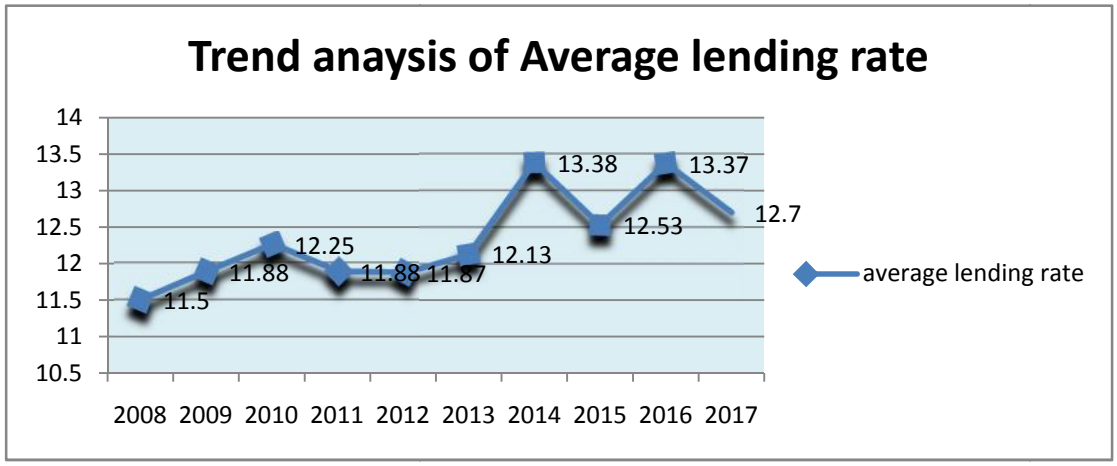


Figure 1.1: Trend Analysis of average lending rate of commercial banks from 2008 to 2017

2.7. Determinants of bank lending interest rate

The review of empirical literatures on bank lending rate show that determinants are organized in two parts namely internal and external determinants. The internal determinants include variables driven from financial statement and variables internal by their verity of nature. External determinants comprise review of industry-specific determinants which has impact on the banking sector performance alone and macroeconomic determinants which affect all business activities of a given country.

According to Mensah and Abor (2014) lending rate of banks is determined by a numbers factors includes, bank specific factors (such as bank specific risk, bank size and efficiency), bank industry characteristics (market structure), regulatory factors (capital adequacy ratio and reserve requirement) and macroeconomic factors (inflation volatility of interest rates and exchange rate). Larger banks as compared to smaller banks are able to offer lower lending rates

because their scale of operation earns them economies of scale, and thus they are more likely to offer lower lending rates. Determinants of lending interest rate used below;

2.7.1. Internal Determinants

The internal (bank-specific factors) are factors that are related to internal efficiencies and managerial decisions. Such factors include determinants such as Deposit interest rate, bank size, Liquidity, Operating cost to total assets ratio, Profitability ratio, etc.

Deposit interest rate; The term Deposit Rate refers to the amount of money paid out in interest by a bank or financial institution on cash deposits. Banks pay deposit rates on savings and other investment accounts. The deposit interest rate is paid by financial institutions to deposit account holders. Deposit accounts include certificates of deposit, savings accounts and self-directed deposit retirement accounts. Charging high deposit rate has multiple impacts on credit risk. First, offering high deposit rate directly influence the lending rate. Landing rate in turn, especially charging high-risk premium for risky borrowers, have multiple effect on borrower's loan repayment capacity. Therefore, it has positive impact on loan quality since charging high interest rate means raising borrowing costs, which increase loan burden. Second, offering high deposit rate encourage depositors or improve the level of deposit mobilization and create an Excess loanable fund. The Deposited money should not be kept idle since the deposit is not free of cost. As a result, it enforces the bank to increase its lending volume and thus credit risk. Growth in deposit creates excessive loanable fund that motivated the bank to take credit risk or extend credit to riskier borrowers (Atakelt, 2015).

Nasrin et al.(2015) the determine factors that mostly affect the lending rates. Short term increases in interest rates to deposit rates increase the banks costs of funds, resulting in the higher interest on loans. For this purpose, a set of macro and bank specific variables are used to examine whether the lending rates move due to changes in deposits rates.

Bank size; is measured by log of total asset of each bank. The negative impact of bank size on credit risk was reported in some literature. It is justified that large banks have ability to deal with credit risk by formulating sound and effective Credit risk management system, introducing modern risk management instrument and technology as well as a better portfolio diversification

opportunity and having Competitive advantage on economies of scale as the result large bank send loan to their customer with small landing rate (Atakelt, 2015).

Bank size was also established to be a great determinant of lending rate of commercial banks as larger banks lacked the ability to offer lower lending rates as the interest spread maintained was lower compared to that of the smaller banks. As indicated by Adoah (2015) the large size bank has the advantage of providing a large menu of financial service to their customers and thereby mobilizes more funds which will lead to serving their customers with low lending rate. Cole et al. (2004) recommend that, smaller banks adopt small business loan underwriting practices that are riskier than those of larger banks.

Liquidity ratios; Liquidity is measured by the ratio of liquid assets to total assets. Liquid assets refer to cash and deposit balances in other banks including the reserve requirement in the National bank (Kuiptui 2014). The excess liquidity is an implicit tax for the banks because of the opportunity cost associated with excess liquidity. The relationship between bank liquidity ratio and lending interest rate is positively related (Adoah, 2015). This show that when bank liquid asset increase, bank lending interest rate moves upwards since they need to be compensated for keeping more liquid assets. Abdul et al. (2011) on their study they explains for this relationship is the low return on highly liquid asset.

Liquidity risk is the risk that a bank is not able to meet up or fulfill its short-term debt obligation or its short-term financial needs effectively and on time (Samad, 2004). Banks are normally faced with this risk when they are unable to convert a security or an illiquid asset to cash without a substantial loss of income or capital. Liquidity is considered to be the life and blood of commercial banks. Examples of liquidity risks banks usually faced are funding and time risk. According to Emeri (2016), banks can measure their liquidity risk using any of the following ratios; a loans/total asset, purchase funds/total assets, loans/core deposits. In this study liquidity ratio measurement used is liquid asset/total assets. Banks' are usually faced with liquidity risk and are unwilling to give out loans when they are unable to convert an illiquid asset to cash without a substantial loss of capital. Emeri (2016) exhibited a negative relationship between liquidity and lending rate. Thus, a negative relationship is expected between liquidity ratio and bank lending rate in this research.

Profitability Ratio; A profitability ratio is a measure of profitability, which is a way to measure a company's performance. Profitability is simply the capacity to make a profit, and a profit is what is left over from income earned after you have deducted all costs and expenses related to earning the income. The formulas you are about to learn can be used to judge a company's performance and to compare its performance against other similarly-situated companies. This is generally considered as a good indicator to evaluate the profitability of the assets of a bank in comparison to other banks in the banking industry. Mbao, et.al (2014) found negative association between lending rates and profitability. They asserted that increases in bank costs tend to be passed on to borrowers in the form of higher lending rates, and that factors that help improve bank income also tend to benefit borrowers by lowering the interest rates. A negative relationship is expected between lending interest rate and profitability. Windmeijer (2005) again found, during an economic expansion demand for lending is high and business profitability is good, resulting in more profitable loans, more bank capital and an expanding credit environment in which banks lend more at lower rates as they compete for business.

Operating cost to total assets ratio; Operating cost to total assets ratio has been considered as one of the independent variable in this study. The ratio of operating expenses to total assets measures the cost required to provide a loan unit, and depends on the productivity of staff and other operating costs are administrative burdens, branch network, transport, depreciation (Bhattarai,2015 and Samuel, 2018). The key indicator of efficiency of commercial bank is the ratio of operating costs to total assets. According to Francis (2014) the ratio of operating costs to total assets is lower the ratio implies, the higher the efficiency of the commercial banks.

Increase in operational costs such as transaction costs, level of projected profits lead to increased lending rates (Karanu and Ireri, 2015).There are a number of loan cost factors that influence the way banks set lending rates. Among these, the costs of debt and equity funding and the losses that banks expect to incur on their lending activities are particularly important. The increase in the cost of debt funding primarily due to higher costs of deposits and long-term wholesale debt has been a key driver of the increase in banks' lending rates relative to the cash rate in recent years. As such, changes in the contribution of equity costs in funding loans are determined solely by changes in the share of equity in funding. Operational costs, especially

staff costs, for most commercial banks are high and this has a bearing on the determination of base lending rates. In particular, staff loans had, on one occasion, been explicitly included in the calculation of the base Lending rate. This, it can be inferred that these loan costs were being passed directly on to clients. The high staff costs may be due to the fact that new banks entering the market have to "poach'' staff from existing banks, therefore resulting in higher salaries which become sticky downwards.

Higher operational efficiency may induce banks to pass the lower costs to their customers in the form of lower loan rates. (Samy, 2003) found a positive relationship between overhead cost and lending interest rate of Tunisia banks. The study made by Mbao et al. (2014) in Zambia founded that high lending rates are primarily a reflection of high costs of doing business.

2.7.2. External Determinants

The External determinants of private commercial bank lending rate are those factors which are external to the commercial banks and hence outside the control of management. As indicated by Athanasoglou et al. (2005) the external determinants are variables that are not related to bank management but reflect the economic and legal environment that affects the operation and performance of financial institutions. Although the commercial banks cannot control these indirect factors but can build flexibility into their operating plans to react to changes in these factor (Rajan, 2003).The following sections discussed about external determinants of commercial bank lending rate such as industry-specific determinants and macroeconomic variables.

2.7.2.1. **Industry specific factor**

Market Concentration

HHI represent the industry characteristic which index of market concentration or competition. Market concentration measures the degree of the competition each bank faces in the market. Theoretically, competitive pressure led to competitive pricing thus leading to higher efficiency of intermediation process and lower lending rate (Adoah, 2015). However, Gambacorta (2004) is of the view that market concentration in the banking industry on lending rate can be ambiguous.

This study also uses the Hirschman-Herfindahl Index (HHI) as an indicator of industry

competition. It is measured as the sum of square of the market shares of all firms in industry j for year t, the market share of each bank is the ratio of total asset (ta) the ith bank to the industry's total asset (TA).

$$HI_t = \sum_{i}^{n} s_{it}^2 = \sum_{i}^{n} \left| \frac{ta_{it}}{TA_t} \right|$$

A concentration that makes banks behave in an oligopolistic manner will lend to higher cost of borrowing and low return to depositors while a concentration that arises because more efficient banks are replacing less efficient banks may lead to lower lending rate and higher deposit rate. The Herfindahl Hirschman index (HHI) is the normally used to compute market concentration. The HHI ranges from 0 to 1 with higher values indicating high concentrated and less competitive banking industry. The two factors for computing Herfindahl Hirschman Index are: The number of firms in industry and each firm's market share. The fewer the number firms in the industry the easier it is for them to co-ordinate high prices. Similarly, the greater the market share that a firm possesses the easier it is for that firm to set higher prices. The index is calculated by squaring the market share of each firm competing in the market and then summing up the resulting numbers. The HHI is expressed as HHI = Σ (Ta it/ta t) 2 Where tea the market share of the firm (ta) and Ta is the total industrial asset. In this particular context, the market share of each bank is calculated as its portion of loan and advance to the total industry loan. The HHI can range from zero to one. According to the international standards and a result of less than 0.1 is considered to be a highly competitive market, a result of 0.1 to 0.8 is considered moderately concentrated and a result that is greater than 0.8 is considered highly concentrated (Kari, 2007).

The major advantage of the HHI over other concentration measures is that it provides a benchmark to identify the type of market and gives more weight to larger firms, since market shares squared prior to being summed, and it also considers the distribution of firms in a market. It approaches zero, when a market consists of a large number of firms of relatively equal size. The HHI increases both as the number of firms in the market decreases and as the disparity in size between those firms increases. In analyzing the HHI for Ethiopian commercial banks, the following concentration indicators are utilized: total assets, total deposits, demand deposits, time and saving deposits, total loans and advances, net interest margins and total

incomes.

2.7.2.2. Macroeconomic Determinants

Macroeconomic variables employed in this study are Inflation. Macroeconomic variables represent factors that influence business performances in the economy and the capacity for a loan payment. Banks has a major role in economic activity of every country through provision of financial services. In addition to banks influence on economic activities, macroeconomic factors also affect the performance of commercial banks in a given country.

Inflation rate: Inflation rate is defined as a loss of purchasing power of a currency which results in a general and sustained increase in prices and it is proxied by the Consumer Price Index (CPI). This variable is an indicator of the cost of doing business in an economy. Inflation is an increase in the general price level and is typically expressed as an annual percentage rate of change. Inflation depreciates the value of money. When inflation increases, banks also increase their cost of credit to keep the space with inflation, which will result in increased lending rate in the country(Banda, 2010).As inflation increases beyond some point, it results in a decrease in bank lending. Quite a few economists have established that countries with high inflation rate have unproductively banking sectors. This adverse suggests that inflation reduces banks' 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 that universal banks lend to their customers reduces as inflation increase. This variable is expected to be positively correlated with lending rate.

2.8. Empirical literature review

Various studies have been conducted relating to this study of significant impact on lending rate. But there is very little 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.

2.8.1. Empirical literatures Review of International Studies

Studies conducted by Georgievska et al. (2010) investigate the determinants of lending rates and interest rate spreads in the commercial banking sector in Greece. In this paper a panel data

of all the listed banks during the year 2001 to the first half of 2009. The main conclusion of this paper is related to the results regarding the size of the bank assets and the market share, which indicate a considerable use of the banks' market power in determining their lending rates and interest rate spreads. The study found that, an increase in the bank size and a decrease in the market share of certain banks (i.e. higher competition) will cause a further fall in the lending rates and a narrowing of the interest rate spreads. So over all conclusions is indicate that lending rates are mostly influenced by bank size and market share and to a lesser extent by deposit rates and non-performing loans.

Siddiqui (2012) conducted a study to estimated lending interest rate in Pakistan using individual bank specific factors based on a panel data of 22 banks. Market share, liquidity risk, administrative expenses as a percentage of total assets, non-performing loans as a percentage of total income and return on assets after tax payment as a percentage of average assets were the variable of the study. The study found that lending rate is significantly affected by administrative costs, non-performing loans and return on assets in all the regressions.

Besides, Aliet al. (2016) conducted a study on the potential inner factors of the lending rate in the commercial banking sector of Pakistan. For this purpose, seven bank-specific explanatory variables (capital adequacy, management efficiency, liquidity, asset quality, investment to asset, loan to asset and deposit to asset ratios) were selected to determine their impact on lending behavior. Panel data techniques were employed on secondary data collected from the annual financial reports from a sample of nineteen major commercial banks over a period of 2007 to 2014. For the purpose of analysis, descriptive statistics, Pearson correlation and panel data techniques for regression analysis such as the fixed effect regression models were considered after conforming to the Housman specification test. The findings of this study revealed that only four out of seven explanatory variables (ratio of investment to total assets, deposit to asset, loan to asset and liquidity ratio) have a significant relationship with lending rate. Two of the significant determinants (liquidity ratio and investment to asset ratio) are positively correlated while the remaining two significant explanatory variables (loan to asset ratio and deposit to asset ratio) are found negatively correlated with lending interest rate.

A study conducted by Ranjan (2003) The study sought to establish "Economic Determinants of Non-Performing Loans: Perception of Pakistani Bankers" the study found as there is a positive

relationship with NPLs and lending rate since an increase in interest rate curtails the paying capacity of the borrowers. Lending rate is expected to have positive association with NPLs in this study. Accordingly, this study considers average lending interest rate (average of Minimum and Maximum Lending Rate) as proxy of lending rate as being commonly used by commercial banks for pricing loans.

Besides, Gambacorta (2004) studied how banks set lending interest rates in the Italian banking system. The study employed a panel regression analysis using quarterly series from the period 1993 to 2001 on 73 banks. The study used variables such as the monetary policy rate and reserve requirements as proxies for monetary policy, loan and deposit demand, the industrial structure, interest rate volatility, operating costs, bank size, inflation, real GDP and credit risk. The study found that interest on short term loans are less sensitive to monetary policy. Also interest rate spread is not influenced by the size of banks. However, inflation and real GDP are positively related to lending rate but inversely related to the deposit rates after controlling for any differences in the banks specific characteristics. Higher credit risk and operating cost increases the cost of financial intermediation which then results into higher lending rates, this is because banks may attempt to recover some of their costs.

A study conducted by Khan (2014) to investigate the impact of interest rates changes on the profitability of commercial banks being operated in Pakistan by examining the financial statements of four major banks during 2008 to 2012. As a result variations in the interest rate depress the savings and investment and on the other hand it increases the efficiency of banks lending. In the study interest rate was an independent variable and bank profitability was a dependent variable. To examine the impact of interest rate changes on the profitability of commercial banks in Pakistan, Pearson correlation method was used in the study. As a result it was found that there was strong and positive correlation between lending interest rate and commercial banks profitability. It means if the value of interest rate is increases/decreases then as result value of banks profitability will also increases/decreases.

A study conducted by Mbaoet al. (2014)the study examined the determinants of bank lending rates in Zambia. The authors have employed panel regression techniques using detailed bank-specific data that reflect a wide range of cost and income determinants for banks.The results indicate that lending rates are to a significant extent influenced by variables relating to banks'

costs. They found that inflation has significant impact on nominal interest rates on an almost one-to-one basis. Apart from inflation, however, elements of banks' balance sheet reveal that lending rates are to a significant extent also positively impacted by variables associated with higher cost structures or lower income.

A study conducted by Nasrinet al.,(2015) the intention of this study is to analyze lending rate behavior in Bangladesh and also to determine the factors that mostly affect the lending rates. For this purpose, a set of macro and bank specific variables are used to examine whether the lending rates move due to changes in these variables. Those variables are deposits rates, inflation, and non-performing loans. In addition, policy variables such as the domestic policy rate and the foreign interest rate also appear to be quite important.

Besides, Cihak (2004) conducted a study on analyses the determinants of lending rates and interest rate spreads in Croatia between 1999 and 2003. Cihak supposes that lending rates and interest rate spread is a function of the deposit rate, total assets, market share, and the share of non-performing loans in total loans, capital adequacy, liquidity, dummy variables for privatized and green-field banks, as well as the Treasury bill rate. The empirical results show the existence of an inverse relation between lending rates and interest rate spreads, on the one hand, and bank size (total assets), liquidity and foreign ownership, on the other. In addition, market share, non-performing loans, deposit rates and money market rates have a positive effect on lending rates and interest rate spreads. Capital adequacy has a negative effect on lending rates.

A study also conducted by Bhattarai (2015) to investigate the "determinants of lending rate "of Nepalese commercial banks. The analysis of data was based on a sample of 6 commercial banks observed over the period 6 years (2010 to 2015). The models used in the study were: pooled OLS model, fixed effects model and random effects model. This study has used 'lending rate' as dependent variable, while the explanatory variables are: operating cost to total assets ratio, deposit interest rate, profitability and default risk. The estimated results of these three regression models reveal that operating costs to total assets ratio, profitability and default risk have significant positive impact on the commercial bank lending rate. However, deposit rate has negligible impact on lending interest rate. Thus, this study concludes that the major determinants of commercial banks' lending rate are: operating costs to total assets ratio, profitability and default risk in Nepalese.

2.8.2. Empirical literatures Review of African studies

A study conducted by Obillo(2015) study sought to determine to what extent lending interest rates affect profitability of commercial banks. The study used descriptive research design using secondary data obtained from Central Bank of Kenya for the period of five years from 2010 to 2014. Data obtained was analyzed using SPSS version 20. The study found that lending interest rates have significant positive effect on financial performance of commercial banks in Kenya at 95% confidence level. The relationship between lending interest rates and profitability of commercial banks was also found to be linear with increase in lending interest rates leading to higher profitability. The study also concluded that bank size, capital adequacy, and operational costs all significantly had effect on profitability of commercial banks

A study conducted by Adoah(2015) sought to investigate the determinants of lending rates in the universal banks in Ghana by answering the, what are the determinants of lending rates of Universal banks in Ghana. The study assessed the determinants of the universal bank lending rate in Ghana over the period 2006 to 2013. The result indicates that exchange rate, Treasury bill rate, inflation, Policy rate, reserved requirement, Non-performing loans ,management efficiency, Bank size, Liquidity rate, market competition, which is a proxy of HHI having a positive relationship with the lending rates while GDP, have a negative relationship with the lending rates.

Besides, Abdul (2018) conducted a study on the “assessing the determinants of average lending rates among selected commercial banks in Kenya”. Based on results from the data analysis, it can be concluded that banks specific factors such as capital adequacy, liquidity risk, bank size, non-performing loans and operational cost determine average lending rates of commercial banks in Kenya. Capital adequacy ensures availability of funds and strength to lend hence ability to give more loans offer at competitive interest rate and thus the regulators should ensure banks are capital adequate. According to the study, High non-performing loans increased credit risk and thus resulting to commercial banks high average lending rates. Operational cost was described to result to high average lending rates as commercial banks tried to recoup the high operational costs through interest income which forms the basis for their profit. Credit information sharing as one of the recent banking developments this study found out it does determine average lending

rates charged by commercial banks in Kenya as credit scores of borrowers on which lending rates to individuals are premised are based on credit information shared among financial institutions. Government domestic borrowing and inflation are some of the macro economic factors that were found to be a determinant of average lending into commercial banks in Kenya.

Asamoah and Adu (2016)An Empirical Analysis of the Determinants of Interest Rates in Ghana, using annual time series data from 1970 to 2013.The study found that a long-run equilibrium relationship between the average lending rate charged by commercial banks and its determining factors. In the long run, bank lending rates in Ghana are positively influenced by nominal exchange rates and Bank of Ghana's monetary policy rate but negatively with fiscal deficit, real GDP and inflation. They also find positive dependence of the bank lending rate on exchange rates, and the monetary policy rate both in the short and long run.

A research by Kinyuru(2011) to investigate determinants of lending rates in commercial banks in Kenya by answering the questions, what are the determinants of lending rates of commercial banks in Kenya. The main objective of the study was to establish factors determining lending rates of commercial banks in Kenya. The study concluded that there existed a positive relationship between lending rate and factor determining lending rate for the commercial banks which included market factors such as competitions and risks, cost of fund such as salary of the staff and management fees and inflation due to economic changes in the country.

A study conducted by Okoye and Ricahrd (2013) examined the impact of bank interest rate on the performance of Nigerian Deposit Money Banks between 2000 and 2010. It specifically determined the effects of interest rate and monetary policy rate on the performance of Nigerian Deposit Money Banks and analyzed how bank interest rate policy affects the performance of Nigerian deposit money banks. The study utilized secondary data econometrics in a regression, where time series and quantitative design were combined and estimated. The result confirmed that the interest rate and monetary policy rate has significant and positive effects on the performance of Nigerian deposit money banks. The empirical results show that bank-specific factors play a significant role in the determination of lending interest rate. These include bank size based on bank assets, credit risk as measured by non-performing loans to total loans ratio, liquidity risk, return on average assets and operating costs.

A thesis paper conducted by Bonga (2016) the study sought to determine the major determinants of interest rate spreads in Zimbabwean commercial banking sector. A panel data regression analysis using Stata 11 software is employed for the multicurrency period (2009-2015), for 5 commercial banks in Zimbabwe. Through panel tests on collected data, the study adopted the Random Effects Model. Interest rate spreads have been found to be determined by bank-specific factors, industry-specific factors and the macroeconomic factors. Specifically, bank size, credit risk, return on assets, bank capacity utilization, market concentration and inflation are the main drivers wide interest rate spreads in the banking sector. The study concluded that, it remains the duty of bank managers, central bank regulating authorities and government policy makers to design and implement ways to narrow down interest rate spreads to match regional and world average magnitudes. Banks should implement effective credit risk management strategies, business growth strategies and earnings growth strategies, while government policy makers should control and stabilize inflation. Competitive policies in the entire banking industries are expected to yield competitive pricing of financial products.

Besides, Ahmed (2016) in the study of examining the macroeconomic determinants of lending rates in the commercial banks in Ghana. The finding of the study shows that monetary policy rate (MPR) and Inflation has positive drivers of the high lending rates in the economy.

Ngata&Njeru (2015) studied the impression of Basel Liquidity accords in the banking system of Kenya on lending rates. In this study data was collected from CBK and World Bank. All commercial banks in Kenya were designated as the target population. The relationship of the dependent variable and independent variables; core capital requirement, liquidity ratio, reserve requirement and loan to deposit ratio requirement was measured by regression and correlation techniques. The conclusion of the study showed that there was an insignificant relationship between the core capital requirement and reserve ratio requirement on interbank lending interest rates but significant relationship between the liquidity ratio requirement and interbank lending rates. Finally, the findings demonstrate a significant relationship between the loans to deposits.

Besides, Wanjiru (2015) investigated determinants of interest rate spread among commercial banks in Kenya. The study found that inflation and operation cost has no effect on interest rate spreads among commercial banks in Kenya but found that market structure has a significant influence on interest rate spread.

A study conducted by Ngumi(2014) to Investigate the effect of real lending rate on the level of non-performing loans in commercial banks in Kenya. The study findings indicated that real lending rate affect the level of non- performing loans. Results indicate nominal lending rate and a change in the nominal lending rates affects the level of nonperforming loans. The finding of the study shows that real lending rate sharing has an effect on level of non-performing loans. A change in the effective lending rate affects level of nonperforming loans. Real lending rate is the rate of interest charged on loans by the bank after adjustment to take into consideration the inflation rate. It is found that a bank charging high interest rates will have a higher level of NPLs than the one with lower interest rates.

A study conducted by Omondi (2014) conducted a study on the relationship between annual inflation rate and Kenya Commercial Bank base lending rate, new lending volumes and loans defaulting. The finding of the study shows that inflation has a significant effect on Kenya Commercial Bank base lending rate.

A study conducted by Okoye and Ricahrd(2013)in order to analyze the impact of bank lending rate on the performance of Nigerian Deposit Money Banks between 2000 and 2010. It specifically determined the effects of lending rate and monetary policy rate on the performance of Nigerian Deposit Money Banks and analyzed how bank lending rate policy affects the performance of Nigerian deposit money banks. The study utilized secondary data econometrics in a regression, where time-series and quantitative design were combined and estimated. The finding of the study shows that lending rate and monetary policy rate has significant and positive effects on the performance of Nigerian deposit money banks. The implication of these is that lending rate and monetary policy rate are true parameter of measuring bank performance.

A thesis paper conducted by Mwangi (2014) to examines the relationship between interest rates and the financial performance of Deposit Taking Microfinance Institutions in Kenya. The study involved collecting secondary data from Central Bank of Kenya for five years (2009-2013) using multivariate regression model. The finding of the study shows that a strong relationship exists between lending interest rates and financial performance of Deposit Taking Microfinance Institutions.

A thesis paper conducted by Karanu and Ireri (2015) to investigate the effects of operational costs on lending rates of commercial banks in Kenya. The finding of the study shows that increase in operational costs such as transaction costs, level of projected profits lead to increased lending rates. The study established that there existed a strong positive relationship between lending rate and operational cost.

Besides, Samuel and Peters (2014) conducted a study on how interest rates affect the profitability of deposit money banks in Nigeria. The study was based on country aggregate level annual data that covered a period of thirteen years 1999 to 2012 and made use of multivariate regression analysis under an econometric framework. The finding of the study shows that Maximum lending rate, Real Interest rate and Savings deposit rate have negative and significant effects on the profitability of Nigerian deposit money banks.

2.8.3. **Previous Related Studies in Ethiopia**

A thesis paper conducted by Malede (2014) to investigates the main determinants of commercial bank lending in Ethiopia by using panel data of eight commercial banks in the period from 2005 to 2011. It tested the relationship between commercial bank lending and its some determinants (bank size, credit risk, gross domestic product, investment, deposit, interest rate, liquidity ratio and cash required reserve). Seven years financial data of eight purposively chosen commercial banks were used for analysis purpose. Ordinary least square (OLS) was applied to determine the impact of those predictor variables on commercial bank lending. The finding of the study shows that, there is significant relationship between commercial bank lending and its size, credit risk, gross domestic product and liquidity ratio. But deposit, investment, cash required reserve and interest rate does not affect Ethiopian commercial bank lending for the study period. A positive regression coefficient of bank size, credit risk, gross domestic product and liquidity ratio implies that, they are tend to be move in the same direction with banks' lending.

A thesis paper conducted by Gezu (2014)to investigate the determinants of nonperforming loans (NPLs) of commercial banks in Ethiopia based on panel data analysis on the time period from 2002 to 2013. The data was analyzed by using Fixed Effect Model. The finding of the trend analysis of NPLs shows a downward sloping of NPLs of commercial banks in Ethiopia over the time of study. The finding of the study shows that negative and statistically significant impact of

lending rate on the level of NPLs. This implies due to other extraneous factors, increase in lending rate reduces the levels of NPLs for commercial banks in Ethiopia.

A thesis paper conducted by Engida (2015) Determinates of Ethiopian commercial banks liquidity and its impact on profitability. In order to achieve the objective a secondary sources of data were collected from eight commercial banks in the sample covering the period from 2002/03 to 2013/14 and analyzed them with panel data regression analysis. The results of regression analysis showed that Bank size and Loan growth had negative and statistically significant impact on banks liquidity measured by Liquid asset to total Asset. Real growth rate of gross domestic product on the basis price level, Interest rate on lending ,Non-performing loans in the total volume of loans, Bank size, Actual reserve ration and short term interest rate had positive and statistically.

A thesis paper conducted by Getahun (2014), Determinants of lending behavior of banks: a case study on commercial banks of Ethiopia. The results of panel data regression analysis showed that volume of deposit and bank size had positive and significant impact on loan and advance. Liquidity ratio and interest rate had negative and significant impact on loan and advance. Cash reserve requirement, and inflation rate had positive and significant impact on loan and advance. Real GDP growth rate had statistically insignificant impact on bank's loan and advance.

Kanna and sudalaimuthu (2016) commercial bank lending in Ethiopia. Major findings of the study include: mixed trends are found in total advances by public and private sector commercial banks with public banks dominating the lending scenario in the recent years; lending by private banks showed downward trend since 2010; very high positive correlation existing between deposits mobilized and advances disbursed by the Ethiopian banking industry; and a compounded annual growth rate of 22.7% is registered by all commercial banks in the recent decade. The study is highly significant as it is a pioneer work on the commercial bank lending in Ethiopia.

Negera (2012) also in his thesis paper on the title of "Determinants of Nonperforming Loans of Banking sector in Ethiopia" The finding of the study shows that interest rate has no impact on the levels of NPLs via OLS regression model.

Aregu (2014) examines the bank industry and macro-economic specific factors affecting banks interest rate spread for a total of eight commercial banks in Ethiopia, covering the period of

2004-2013 The findings of the study show that credit risk, liquidity risk, , operating cost, concentration, reserve requirement, gross domestic product , interest rate volatility and exchange rate volatility have statistically significant and positive relationship with banks interest rate spread. Conversely return on asset, non-interest income and financial development indicator has a negative and statistically significant relationship with banks' interest rate spread. However, the relationship between management quality and inflation is found to be statistically insignificant.

2.9. Conclusions on the literature review and knowledge gaps

As per the review of the literature, there are a number of empirical studies conducted on the determinants of lending interest rate in developed, emerging, developing and Sub-Saharan African countries focusing on different sets of factors (bank specific, industry-related and macroeconomic factors) and methodologies (time series and panel data methods) depending on the type of data, frequency and coverage.

The empirical studies also suggest that lending interest rate determinants vary across countries and regions. For instance, some of those studies argued that the main determinants of lending interest rate are bank specific factors; whereas others claim that the macroeconomic factors are the most important factors that explain the level of lending interest rate particularly in developing countries. Therefore, there is a continuous debate on the key determinants of lending interest rate in different countries.

In developing countries like Ethiopia, banks act as the main players in channeling funds from surplus units to deficit units, and for this reason it is important that their intermediary role is carried out with the lowest possible costs in order to achieve social welfare. After financial sector reform, National Bank of Ethiopia imposed control over deposit rates in order to keep the lending rates low. The NBE had set the minimum saving interest rate and leaving lending rate to commercial banks with the aim of improving efficiency in the intermediation process. However, interest rates in Ethiopia are not yet set based on demand and supply forces (Malkiel, 2013).

However, there is no universally accepted findings to the determinants of lending interest rate, since, countries differ each other by their economic, financial, regulatory and operating environments.

For example Adoah (2015) the determinants of lending rates in Ghana. The result of the study shows that inflation policy rate, Non-performing loans, management efficiency, bank size, liquidity ratio, have a positive relationship with lending rate and a negative relationship between GDP and lending rates is Inconsistent with Georgievska et al. (2010) the determinants of lending rates in the commercial banking sector in Greece. The results, shows that an increase in the bank size will cause fall in the lending rates.

Cihak (2004) study sought to investigate the factors influencing lending rates in Croatia from 1999 to 2003. The result of the study indicated that market share, deposit rates, Treasury bill rate and nonperforming loans have a positive effect on lending rates is inconsistent with Ali et al.(2011)the study examines potential inner factors of the lending rate in the commercial banking sector in Pakistan. The findings of this study revealed that deposit rate has a significant and negatively relationship with lending rate.

Adoah (2015) this study sought to investigate the determinants of lending rates in the universal banks in Ghana the result indicates that bank size, Non-performing loans, management efficiency, market competition, having a significant and positive relationship with the lending rates is Inconsistent with Georgievska et al.(2010) the determinants of lending rates in the commercial banking sector in Greece. The findings of this study revealed that that bank size has a significant and negative impact on the commercial bank lending rate.

Cihak (2004) investigated the factors influencing lending rates in Croatia from 1999 to 2003. The result of the study indicated that liquidity ratio have a negative effect on lending rates is inconsistent with Ali et al.(2011)the study examines potential inner factors of the lending rate in the commercial banking sector in Pakistan. The findings of this study revealed that liquidity ratio have a significant and positively relationship with lending rate.

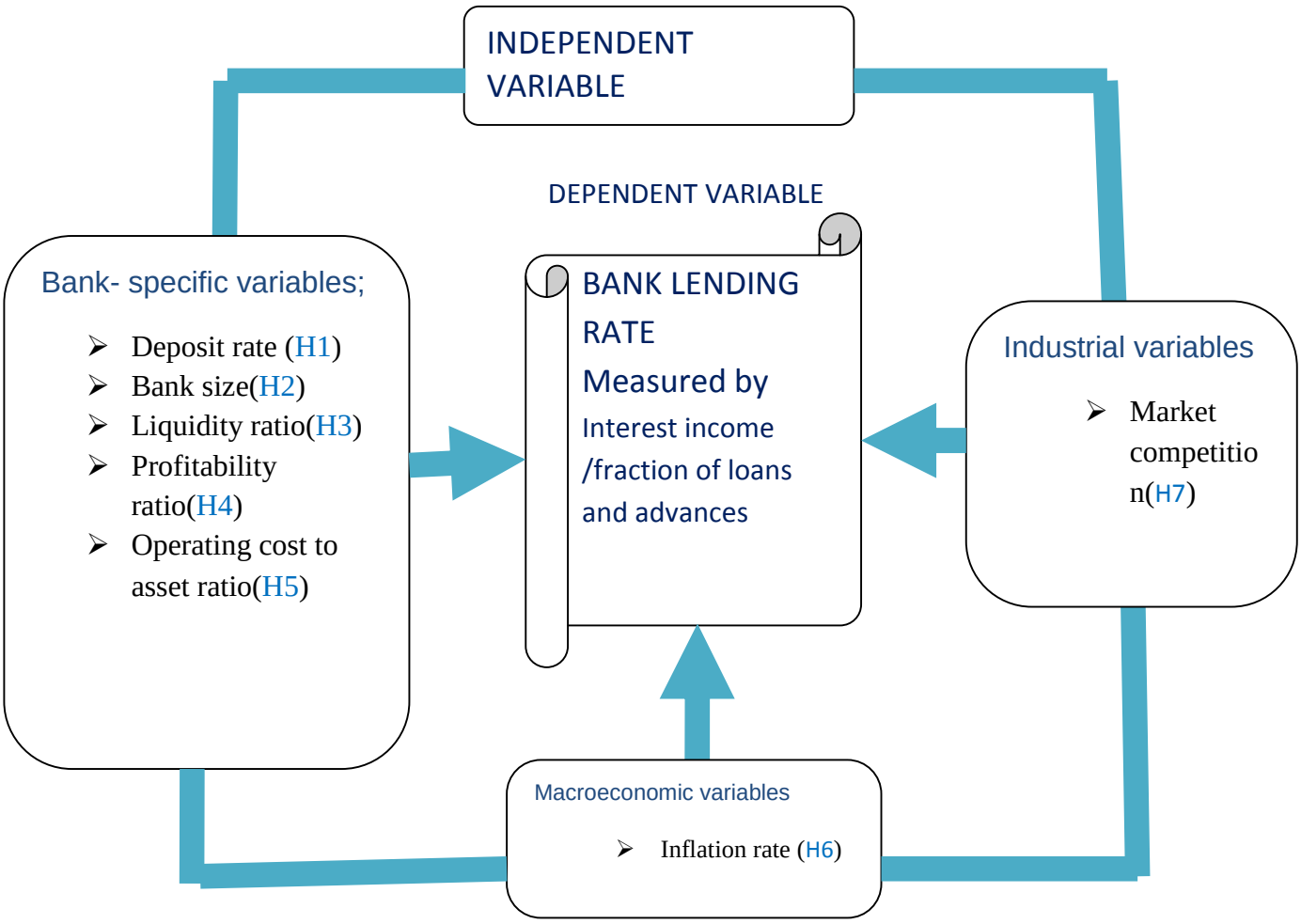
Above studies to test determinant factors individually to test but not both factors such factors are bank specific factors, industry-related factor and macroeconomic factors but this study to test both factors together in Ethiopian context. Those studies also were conducted by undertaking different assumptions, which fit into the Particular situation. Various empirical studies reviewed in this chapter have further revealed the opposing views of researchers on the issue of Banks' lending interest rate.

In Ethiopia, as far as the knowledge of the researcher is concerned, there are a few types of related researches conducted in this area but those researchers have entirely focused only on determinants bank performance, determinants of banks' profitability and determinants bank lending behavior rather than determinants lending interest rate. Hence there is no empirical study in Ethiopia concerning the effect of bank specific factors, industry-specific factors and macro-economic factors variables (deposit rate, bank size, , liquidity ratio, ,operating cost to total asset ratio, profitability, market concentration, inflation rate) on lending interest rates that are not tested by prior Ethiopian researchers. Therefore, this study was addressing the knowledge gap of determinants of Banks lending interest rate on private commercial banks' in Ethiopia.

2.10. Conceptual Framework for the Study

From the literature review, discussed above, the researcher constructed the following conceptual framework to summarize the main focus and scope of this study in terms of dependent and independent variables included.

Figure 1: Conceptual Framework



Source: Researcher compilation from different literature

CHAPTER THREE

RESEARCH METHODOLOGY

This study aims to examine the determinants of lending interest rate of private commercial banks of Ethiopia. Accordingly, this chapter discussed the research procedure that is used to carry out this study. Increase, it starts by discussing research design followed by the nature and instruments of data collection and sampling design. The subsequent section presents and discusses method of data process and analysis. Finally, definition of study variables with their measurement and model specifications are presented.

3.1 Research Design and Approach

As noted in 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 is an explanatory research. Besides, there are three types of research approach namely qualitative, quantitative and mixed approach. Even though, each approach has its own objective and application time, in the selection process one should take into account the nature of research problem or issues being addressed, the researchers personal experience and the audience for whom the report presented. Therefore, in this study the quantitative research approach was used, since, quantitative nature of the data used.

3.2 Population of the Study

The study populations are all private commercial banks in Ethiopia. As stated in NBE 2016/17 annual report there are sixteen private commercial banks in Ethiopia those are; 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 OromiaS.C, Lion International Bank S.C, Berehan 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 Sampling Design

Sample design deals with sample frame, sample size and sampling technique. 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, 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 2016/17 annual report from these 18 banks, only 17 banks are Commercial Banks (16 private and 1 public). This is excluding the Development Bank of Ethiopia which provides banking service to the selected priority sectors. The sample included in this study is those private commercial banks having at least ten years working experience (from 2008 to 2017).The selection criteria set by the researcher was first, the required banks are only private Commercial banks in Ethiopia. Second, those private commercial banks should have started operation before 2017 so that they can have financial statements for consecutive ten years. The rationale for ten year data is to increase the number of observation. Thus, private banks that operate less than ten years were excluded from the sample. Because of this, from 16 private commercial banks operating in the country this study takes sample of eight private commercial banks of which audited financial statements are available within the study period namely,: 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).Therefore, the matrix for the frame is 10*8 that includes 80 observations. As noted by 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 select the required sample of banks from the above listed banks since it is viable in line with time and funds available for this study.

3.4 Types and Source of Data

As noted in Gujarati (2009) there are three types of data available for empirical analysis namely: 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 enables the researcher used panel data type.

Hence, in this study balanced panel data (companies have the same number of observations) were used. Since panel data has the combination of both cross-sectional and time-series it is more useful data 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 collinearity among variables (Gujarati, 2009). As stated in Wooldridge (2012) the main advantage of using panel data is that it allows overcoming of the unobservable, constant, and heterogeneous characteristics of each bank included in the study. Even though each has its own strength and limitation there are two sources of data namely: primary and secondary source (Johnand Clark, 2006). The reliability and validity of the secondary data highly depend on the source of the information. Source data from large well known organization and survey data's from government organizations are highly likely to be reliable (Sunders et al, 2012).In order to gather the required information which attains the research objectives, only secondary data (annual audited financial statements) were collected.

3.5 Data collection method

Once the research design including sampling plan formalized the coming phase is collect data. In this study, secondary data were used to meet the stated objectives. The audited financial statements (balance sheet and income statement)for this study were gathered from national bank of Ethiopia and MOFEC for sampled private commercial banks within ten years period from 2007/2008 up to 2017.

3.6 Method of Data analysis

After the data is collected, the next step is to analyze the collected data to achieve the stated objective. In this study two types of analysis were used; these are descriptive statistics and multiple regression analysis. The descriptive analysis part deals with a simple description of variables. It includes mean, maximum, minimum and standard deviation of each variable. On the other hand, regression analysis, the most important part of the analysis, helps to identify the determining variables effect and draw relationship between dependent and independent variables. According to Brooks (2014) regression is concerned with describing and evaluating the relationship between a given variable (usually called the dependent variable) and one or more other variables (usually known as the independent variables). Thus, the researcher adopted panel

data regression model to examine the effect of determinant factors on bank lending rate. For this purpose, E-views 8 econometric software package was used.

Besides this, as noted in Brooks (2014) there are assumptions required to confirm that the ordinary least square (OLS) estimation technique and also 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). Therefore, diagnostic tests were performed to ensure whether the assumptions of the CLRM are violated or not in the model. Diagnostic checking is done to test whether the sample is consistent with the following assumptions.

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

I. The errors have zero mean ($E(u_t) = 0$)
II. Variance of the errors is constant ($Var(u_t) = \sigma^2 < \infty$)
III. Covariance between the error terms over time is zero ($cov(u_i, u_j) = 0$ for $i \neq j$
IV. Test for Normality ($u_t, N(0, \sigma^2)$)
V. Multicollinearity Test

If all the above assumptions are consistent with the sample, E-view result will be accurate and reliable. Consequently, the results for the model assumptions test are presented as follows:

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

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

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

According to Brooks (2014), the variance of the errors is constant. This is known as the assumption of homoscedasticity. Heteroscedasticity means that error terms do not have a constant variance. If heteroscedasticity occur, the estimators of the ordinary least square method are inefficient and hypothesis testing is no longer reliable or valid as it will underestimate the variances and standard errors. To test for the presence of heteroscedasticity, the popular white

test is employed in this study.

To test for the presence of heteroscedasticity, the popular white test is employed in this study.
The hypothesis for the Heteroscedasticity test was formulated as follow:
H0: There is Homoscedasticity in the model.
H1: There is Heteroscedasticity problem in the model.
$\alpha = 0.05$
Decision Rule: Reject H0 if p-value is less than significance level. Otherwise, do not reject H0.

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

According to Brooks (2014), this assumption is made of the CLRM‟s disturbance terms is that the covariance between the error terms over time (or cross-sectionally, for that type of data) is zero i.e. the errors are uncorrelated with one another. If the errors are not uncorrelated with one another, it would be stated that they are "autocorrelated" or that they are "serially correlated''. In this study to test for the existence of Autocorrelation, the popular Breusch-Godfrey Serial Correlation LM Test was employed.
The hypothesis for the autocorrelation test was formulated as follow:
H0: There is no autocorrelation problem in the model.
H1: There is autocorrelation problem in the model.
$\alpha = 0.05$
Decision Rule: Reject H0 if p-value less than significance level. Otherwise, do not reject H0.

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

According to Brooks (2014) a normal distribution is not skewed and is defined to have a coefficient of kurtosis of 3. One of the most commonly applied tests for normality; the Bera-Jarque formalizes these ideas by testing whether the coefficient of skewness and the coefficient of kurtosis are zero and three respectively. Brooks (2014) also states that, if the residuals are normally distributed, the histogram should be bell-shaped and the Bera-Jarque statistic would not be significant at 5% significant level. The hypothesis for the normality test was formulated as follow:

The hypothesis for the normality test was formulated as follow:

H0: Error term is normally distributed

H1: Error term is not normally distributed

$\alpha = 0.05$

Decision Rule: Reject H0 if p-value of JB less than significance level. Otherwise, do notreject H0.

3.6.5 Test for Absence of Series Multicollinearity Assumption

This assumption is concerned with the relationship between explanatory variables. If an independent variable is an exact linear combination of the other independent variables, then we say the model suffers from perfect Collinearity, and it cannot be estimated by OLS (Brooks, 2014).According to Brooks (2014), multicollinearity will occur if some or all of the independent variables are highly correlated with one another. It shows the regression model has difficulty in explaining which independent variables are affecting the dependent variable. If multi-collinearity problem is too serious in a model, either additional important variable should be added or unimportant independent variable should be dropped. How much correlation causes Multicollinearity however, is not clearly defined. Hair et al.(2006) argue that correlation coefficient below 0.9 may not cause serious Multicollinearity problem. Malhotra(2007) stated that Multicollinearity problem exists when the correlation coefficient among variables is greater than 0.75.Kennedy (2008)also suggests that any correlation coefficient above 0.7 could cause a serious Multicollinearity problem leading to inefficient estimation and less reliable results. This indicates that there is no a single agreed upon measure of Multicollinearity.

3.7 Model Selection (Random Effect versus Fixed Effect Models)

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

convenience. On this score, FEM may be preferable. Since the number of time series (i.e. 10 year) is greater than the number of cross-sectional units (i.e. 8 commercial banks), FEM is preferable in this case. According to Brooks (2014) and Wooldridge (2013), it is often said that the REM is more appropriate when the entities in the sample can be thought of as having been randomly selected from the population, but a FEM is more plausible when the entities in the sample effectively constitute the entire population/sample frame. Hence, the sample for this study was not selected randomly and equals to the sample frame FEM is appropriate.

3.8 Model Specification

Thus in respect of the hypotheses stated above, the main issue is an investigation of relationship that exists between the lending rate of commercial banks and each of explanatory variables that had been identified through literature and theories i.e. Deposit rate operating cost total asset , liquidity ratio, profitability ratio, Asset size of banks, market concentration and inflation. Other factors that are not explicitly included in the model were captured by the error term in the model.

The nature of data that was used in this study enabled to use panel/longitudinal data model which comprises of both cross-sectional elements and time-series elements; the cross-sectional element is reflected by the different Ethiopian commercial banks and the time-series element is reflected in the period of study (2008-2017). The advantage of panel data in question is because it contains more information; it incorporates variability among cross section units and across time (Gujarati, 2004).

According to Brooks (2014), a panel of 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).

According to Brooks (2014), it is very easy to generalize the simple model to one with k repressors‟ (independent variables). $Yi = \beta0 + \beta1x1i + \beta2x2i + \cdots + \beta kxki + \varepsilon i$, $i = (1, 2 \ldots i)$. So, Where Yi is the ith observation of the dependent variable, X1i,…,Xki are the ith observation

of the independent variables, β0 is the constant term , β1….βk are the coefficient of the independent variables of the study, εi is the ith observation of the stochastic error term.

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

LIR=B0 + B1DRit + B2LOG-SIZEit + B3LRit+ B4PRit + B5OCTARit+ B6MCR

B7IFLit+ε……. (Model 1)

Source: Developed by researcher

Where:

LIRit=Lending interest rate of ith bank in year t

DRit=Deposit rate of ith bank in year t

LOG-Sizet=Bank size of ith bank in year t

LRit= liquidity ratio of ith bank in year t

PRit=Profitability ratio of ith bank in year t

MCR= Market concentration of ith bank in year t

OCTARit= Operating cost to total asset ratio of ith bank in year t

IFL= Inflation rate

ε = is the error component for company b at time t assumed to have mean zero E [Є it] = 0

B0= Constant

β= 1, 2, 3…8 are parameters to be estimate; t = the index of time periods and t = 1. . . 10

ith bank in year t

According to Brooks (2014), Specification error occurs when omitting a relevant independent variable, 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 regressing.

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

H0: the model is correctly specified

H1: the model is not correctly specified

α = 0.05

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

reject H0

3.9 Variable description, measurements and Hypothesis development

This study has attempted to see the relationship between the dependent and independent variables through testing the hypotheses regarding to the relationships between lending interest rate of banks and firm specific and macroeconomic factors affecting it in the case of private commercial banks in Ethiopia. It is apparent that the most significant task is to select the appropriate explanatory variables. The selection of variables was based on previous relevant studies likes Gambacorta (2008) & Ali et al. (2016).Commercial bank lending rate is dependent variables used in this study. It is measured in terms of interest income to average loan and advance. Besides, explanatory variables included in this study are deposit rate, liquidity ratio, profitability, Operating cost to total assets ratio, bank size, concentration, and Inflation rate.

As noted by Brooks (20014) including more than one explanatory variable in the model never indicates the absence of missed variables from the model. Thus, to minimize the effect of missed variables from the model, the researcher was included disturbance term in this study.

3.9.1 Dependent Variable

Bank Lending Interest Rate: The dependent variable used in this study is the lending rate. Lending rate is measured by interest income from loans and advances as a fraction of total loans and advances (Asmare, 2014).Lending rates are the prices that borrowers paid when taking loans from the lenders. The lending interest rate on banks may vary depending on the tenure of the loan, the type and value of collateral, the economic sector of loan, etc. As result, it is advisable to take the average. Thus, lending rate is calculated by taking interest income from income statement and loans and advances from balance sheet of commercial banks.

As shown by onyango,(2013)and Mwanga, (2014), lending interest rate as independent variable and measured it asthe ratio of the total interest income on loans over loan balances in Kenya. Lending interest rate is also measured by interest income/outstanding loan (Siddiqui,2012). Lending Rateas measured by ratio Interest earned on loans/Average Loan (Asmare, 2014, Wellington, 2016, Mettle, 2013). Mbao et al. (2014) in their study “determinants of bank lending rates in Zambia” have measured lending rate by using data obtained from commercial banks

income statement and balance sheets as the ratio of the total interest income on loans over loans and advances as reported to the Bank of Zambia.

Lending Rate= Interest income/Average Loans and advance…….(Asmare,2014;Bonga,2016; Wellington, 2016;Mbao et al.,2014)

As indicated by Samuel and Peters(2014)lending interest rates influence the overall economic activity including the flow of goods, services and financial assets within the economy and as well as the whole world. They points out that interest rates relates to the present value to the future value of money. The factors affecting lending rates are initially examined by defining asset of variables which are directly related to bank balance sheets and bank characteristics and are expected to have a strong influence on lending rates.

Bank Lending Rate = Interest income /Average Loans and advance

3.9.2. Independent Variables

This subsection describes the independent variables that are used in the econometric model to estimate the dependent variables. Following prior researches towards the determinants of banks lending rate, the independent variables are classified into bank specific, industry-specific and macroeconomic variables. Moreover, these subsection present hypotheses, by proposing the expected sign of the coefficients, based on academic literature.

3.9.2.1.Bank Specific Determinants

The internal (bank-specific factors) are factors that are related to internal efficiencies and managerial decisions. From the previously factors in literature review the following were selected and used in this research.

Deposit interest rate (DR)

Deposit interest rate is measured as the Average interest rate on deposits on retail deposits at each bank (in percent) (Bhattarai, 2015).Deposit interest Rate refers to the amount of money paid out in interest by a bank or financial institution on cash deposits. The deposit interest rate is paid by bank to deposit account holders. The interest paid on customer deposits depends on deposit

interest rates. Deposit interest rate can increase with increasing Lending interest rate. As indicated by Kaymaz and Kaymaz (2011) have obtained strong evidence of one-way causality between loan interest rates and deposit interest rates. They found significant positive correlation between loan interest rates and deposit interest rates. And also they found investigated that the positive relationship is expected between lending rates and deposit interest rate. High deposit rate directly influence the lending rate. Landing rate in turn, especially charging high-risk premium for risky borrowers, have multiple effect on borrower's loan repayment capacity. Therefore, it has positive impact on loan quality since charging high interest rate means raising borrowing costs, which increase loan burden. In other way high deposit rate encourage depositors or improve the level of deposit mobilization and create an Excess loanable fund. The Deposited money should not be kept idle since the deposit is not free of cost. As a result, it enforces the bank to increase its lending rate (Atakelt, 2015).

DR=Average interest rate on deposits

Hypothesis H1: Deposit rate has positive and significant effect on lending interest rate.

Bank size (SIZE)

Bank Size is measured by the natural log level of total assets of the bank. Bank size was also established to be a great determinant of lending rate of commercial banks as larger banks lacked the ability to offer lower lending rates as the interest spread maintained was lower compared to that of the smaller banks(Uchida et al.,2007)and(Obamuyi,2013). This shows that larger banks have the ability to attract less expensive deposits and also free interest deposits thus favorable lending rates. The large size bank has the advantage of providing a large menu of financial service to their customers and thereby mobilizes more funds which will lead to serving their customers with low lending rate. While small banks are forced to offer higher interest rates to attract fixed deposits thus resulting to high lending rates on advances (Berger &Udell, 1992Bashiri, 2003and Back et al., 2009).

Bank size= Natural logarithms of total assets

Hypothesis H2; Bank size has negative and significant effect on lending interest rate.

Bank liquidity Ratio (LR)

Liquidity ratio is measured as a ratio of liquid assets to total assets. Liquid assets refer to cash and deposit balances in banks including the reserve requirement in the National bank(Kuiptui

2014). Liquidity risk is the risk that a bank is not able to meet up or fulfill its short-term debt obligation or its short-term financial needs effectively and on time (Samad, 2004). Banks are normally faced with this risk when they are unable to convert a security or an illiquid asset to cash without a substantial loss of income or capital. Liquidity is considered to be the life and blood of commercial banks. Examples of liquidity risks banks usually faced are funding and time risk. According to Emeri, (2016), banks can measure their liquidity risk using any of the following ratios; a loans/total asset, purchase funds/total assets, loans/core deposits. In this study liquidity measurement used is liquid asset/total assets. Banks' are usually faced with liquidity risk and are unwilling to give out loans when they are unable to convert an illiquid asset to cash without a substantial loss of capital. Loutskina (2011) and Emeri (2016) exhibited a negative relationship between liquidity and lending and it was significant. Thus, a negative relationship is expected between liquidity and bank lending rate decision or behavior

LR= Total liquid Asset/Total asset of banks

Hypothesis H3: Liquidity ratio has negative and significant effect on lending interest rate.

Profitability Ratio (PR):

Profitability ratio is measured as net income divided by total assets. Bank Profitability indicator profitable banks have the capacity to implement modern Credit risk management system, technology and hiring trained man power/experts as well as having credit information access so that it contributes for low lending rate (Atakelt, 2015). Mbao, et al.(2014),found that negative association between lending rates and profitability (return on assets).They asserted that increases in bank costs tend to be passed on to borrowers in the form of higher lending rates, and that factors that help improve bank income also tend to benefit borrowers by lowering the interest rates they pay. A negative relationship is expected between lending interest rate and profitability ratio this research. It is hypothesized that return on average assets influences banks' lending rates and also banks with high return on average assets offer lower interest rates on loans. Bhattarai (2015) found significantly and positively associated with lending rate using pooled OLS model in Nepalese commercial banks.

PR=Net income/Total asset of banks*100

Hypothesis H4: Profitability Ratio has negative and significant effect on lending interest rate.

Operating cost to total assets ratio (OCTAR):

The key indicator of efficiency of commercial bank is the ratio of operating costs to total assets. The lower the ratio is, the higher the efficiency of the commercial banks. Moreover, high operating costs are likely to include costs due to inefficiency leading to higher lending interest rate. The ratio of operating expenses to total assets measures the cost required to provide a loan unit and depends on the productivity of staff and other operating costs (administrative burdens, branch network, transport, depreciation, etc.)

Thus, operating expense to total assets ratios is the determinant factor in lending rates(Bawumia et al.2005),(Bhattarai,2015),and(Mbao et al.2014).They found that operating costs has positive effect on lending interest rates. Operating inefficiency had positive influence on lending rates. It implies that increasing the level of inefficiency tends to increase cost. In line with theory and past empirical evidence, an increase in operating costs is expected to have positive influence on lending interest rate.

OCTAR= operating cost/Total asset

Hypothesis H5: Operating cost to total assets ratio has positive and significant effect on lending interest rate.

3.9.2.2 Industry Specific Determinant

Market competition (MCR); could measures the degree of competition each bank faces in the market. HHI represent the industry characteristic which index of market concentration or competition. Theoretically, competitive pressure led to competitive pricing thus leading to higher efficiency of intermediation process and lower lending rate. However, Gambacorta (2008) is of the view that market concentration in the banking industry on lending rate can be ambiguous. The primary industry specific variable that is vital to spreads is the bank concentration and competition structure. In this study the researcher uses the most popular measure of industry concentration level namely, Herfindahl-Hirschman index2 (HHI) to measure industry concentration similar to (Ahokpossi, 2013) among others. This indicator is often used in the context of According to the Structure Conduct Performance (SCP) Hypothesis, concentration and bank margins are positively related. A higher Index is reflective of less competition and increasing market power for few banks this ultimately leads to high margin. A

positive association between concentration and interest rate margins is an indication of greater market power and less competition in banking system. Banks in highly concentrated market tend to collude and as a result higher interest rates are charged on loans and lesser rate of return is paid to depositors (Afzal, 2011 and Ahokpossi, 2013).Therefore, a positive relationship between concentration and interest rate is expected. Furthermore some empirical evidence in Ethiopia indicates that banking industry is found to be concentrated (Zerayehu et.al, 2013).

This study also uses the Hirschman-Herfindahl Index (HHI) as an indicator of industry competition. It is measured as the sum of square of the market shares of all firms in industry j for year t, the market share of each bank is the ratio of total asset (ta) the ith bank to the industry's total asset (TA). Thus:

$$HI_t = \sum_{i=1}^{n_{jt}} s_{it}^2 = \sum_{i=1}^{n_{jt}} \left(\frac{ta_{it}}{TA} \right)$$

Hypothesis H6: There is a significant and positive relationship between Market concentration and banks lending interest rate.

3.9.2.3 Macroeconomic Determinants

Inflation rate (IFL); Inflation rate is proxy by the Consumer Price Index (CPI). This variable is an indicator of the cost of doing business in an economy. Inflation is an increase in the general price level and is typically expressed as an annual percentage rate of change. Inflation depreciates the value of money (Adoah, 2015). When inflation increases, banks also increase their cost of credit to keep the space with inflation, which will result in increased lending rate in the country. Gupta, (2010) who carried out a study on the impact of inflation on homes loans, notes that inflation is a major cause of fluctuating interest rates and increase in homes loans interest rates. This means that a rising inflation rate tends to increase the rates on loans and therefore the cost to the bank go up which eventually results to an increase in home loan interest rates, among other loans rates. In work of Adoah(2015), Boyd and Champ (2004), Aboagye et al. (2005) and Bawumia et al (2005) on determinant factors of lending rate. They found a positive relation between inflation and the lending interest rate, suggesting that the improvement in the macroeconomic environment in term lower inflation rate translates to lower net interest rate.

Hypothesis H7: inflation rate has positive and significant effect on lending interest rat

3.10 Operationalization of the Study Variables

This section presents the measurements that were employed to operationalize the study variables. For this study, lending rate was used as dependent variable which is determined by many factors. And this factor was chosen by taking into account the availability of data and its influence on bank lending rate as measured in the literature.

Table; 3.1 Description of the variables and their expected relationship

Variables	Symbol	Measurement	Expected sign	sources
❖ Dependent Variable				
• Lending interest rate	LIR	Interest income on loans/Average Loans and advance	NA	**(Bonga, 2016;Obillo,2015;Wellington,2016; Mwanga, 2014;Onyango, 2013).**
❖ Independent Variables				
• Deposit interest rate	DR	Average interest rate on deposits(in percent)	+	**Cihak(2004),Bhattarai,(2015)and Kaymaz and Kaymaz (2011)**
• Bank size	LOG-BS	Natural log of total assets	-	**Uchida et al., 2007, Obamuyi, (2013), Bashiri (2003)**
• Liquidity Ratio	LR	Liquid asset / total asset	-	**Ngata & Njeru (2015)**
• Profitability ratio	PR	Net income/ total asset*100	-	**Windmeijer (2005)**
• Operating cost to total assets ratio	OCTAR	Operating cost / Total Assets	+	**Samuel (2018),Gambacorta (2008) ,Obillo (2015),Mbao et al. (2014),**
• Market Concentration	MCR	sum of square of the market shares of all firms in industry for year, the market share of each bank is the ratio of total asset(ta) the ith bank to the industry's total asset (TA)	+	**Afzal,(2011),Zerayehu et.al,(2013),Gambacorta (2008)**
• Inflation rate	**IFL**	Average annual rate of inflation	**+**	**Adoah(2015),BoydandChamp(2004),Aboagye et al.(2005)**

Source: Developed by the researcher

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

To address the broad research objectives and to answer the research questions the results of the study as well as enough understanding about the topic and used to identify knowledge gap on the area. The research design used for this study was also discussed in the preceding chapter. In this chapter, the data and its analysis results such as correlation and regression analysis findings were discussed. The chapter has five sections. The first section (section 4.1.) presents the descriptive statistics of the dependent and independent variables. This was followed by section 4.2 that presents results of the correlation analysis. Section 4.3 presents the test for the validity of assumptions for classical linear regression model/CLRM. Section 4.4 discussions for model specification section 4.5 discussions for model selection then, the results of the regression analysis were presented under section 4.6. Finally, discussions of the results of the regression Analyses were made under section 4.7.

4.1. Descriptive Statistics

As clearly mentioned in the earlier chapter, in this study descriptive statistic used to determine minimum, maximum, mean and standard deviation. The following table 4.1 provides a summary of the descriptive statistics of the dependent and independent variables for eight Ethiopian private commercial banks for the period of 10 years from year 2007/08-2017 with a total of 80 observations. This was generated to give an overall description of data used in the model.

Table 4.1: Summary of descriptive statistics for dependent and independent variables

	LIR	DR	LOG-BS	LR	PR	OCTAR	MC	IFL
Mean	0.1149	0.047	1.0431	0.3342	0.1372	0.0119	0.1247	0.1622
Mediam	0.1150	0.050	0.8960	0.3298	0.1296	0.0133	0.1202	0.1164
Maximum	0.1510	0.050	4.2030	0.6350	0.2971	0.0186	0.2685	0.3648
Minimum	0.0700	0.0 40	0.0574	0.1360	0.0850	0.0039	0.0190	0.0288
Std.dev	0.0170	0.046	0.8171	0.1342	0.0361	0.0048	0.0614	0.113
Obsern	80	80	80	80	80	80	80	80

Source: NBE, Banks annual report and computed through E-view 8

The descriptive statistics from Table 4.1 is based on 80 annual observations from 2008 to 2017. Over the study period, Lending interest rate (LIR) which is the dependent variable ranged between maximum values of 15.10% and a minimum value of 7%, with the mean of 11.49%. This indicates that, from the sampled Ethiopian private commercial banks, on average lending rate is 11.49% meaning that Ethiopian private commercial banks charge, on average, 11.49% annual interests on their loans. The most profitable large bank lending rate 11.49% of charged from loan. On the other hand, the least profitable smaller bank of the sampled bank lending rate 15.10% of charged from lending loan. The standard deviation statistics for lending interest rate was (0.0170) which indicates that the lending rate variation between the selected banks during sample period was 1.7%.

Among the bank specific independent variables bank Size was highly dispersed from its mean value of 1.1043 with the standard deviation of 0.817. The maximum and minimum values were 4.197 and 0.574 respectively. This shows that large size bank has the advantage of providing a large menu of financial service to their customers and thereby mobilizes more funds which will lead to serving their customers with low lending rate. The maximum value indicating the large private commercial bank in Ethiopia and the minimum value was some of small privately commercial banks in Ethiopia.

The key indicator of efficiency is operating costs to total assets ratio and the results of operating costs to total assets mean value 0.0119 with the standard deviation of 0.0048. The maximum and minimum values were 0.0186 and 0.0039 respectively. The average operating cost to total assets ratio is 0.0119 and the standard deviation of the same variable is 0.0048. The result shows that Ethiopia private commercial banks are incurring moderate operating costs which are leading to increase lending interest rate. Liquidity ratio has an average of 0.3342 and minimum and maximum rate 0.1360 and 0.6350 respectively. Bank total asset increase, bank lending rate moves upwards and low return of highly liquid asset.

The mean of profitability (PR) is 0.1372, which shows the high profitability position of Ethiopia private commercial banks. However, the standard deviation of the profitability is 0.0361.The standard deviation looks in this study and it indicates the substantial variation of profitability between selected Private Banks' during sample periods.

The mean of deposit rate is 0.047, with the standard deviation of 0.046. The maximum and minimum values were 0.050 and 0.040 respectively. Meaning that on average Ethiopian private commercial banks offers about one half of the lending rate on the customers' deposits, which looks low. The prevailing deposit interest rates are not attractive to customer deposits.

The market concentration indicates that the minimum market concentration is 0.019 while the maximum is 0.268. The mean value of market concentration banking industry has 0.124 it indicate that moderate market concentration over selected banks during sample period.

The general inflation rate 0.1622 of the country on average over the past ten years was more. The maximum inflation was recorded in the year 0.364which is greater than average lending rate of 11.49 and the minimum was recorded in the year 0.028. This indicates that inflation rate increase lead to lending interest rate increase. The rate of inflation was highly over the periods under study towards its mean with standard deviation of 0.1130which indicating highly variation between the selected banks during sample period.

4.2. Correlation Analysis among Dependent and Independent Variables

Table 4.2: Correlation Analysis

	LIR	DR	LOG-BS	LR	PR	0CTAR	MC	IFL
LIR	1.000							
DR	0.668	1.000						
BS	(0.325)	0.504	1.000					
LR	(0.424)	(0.610)	(0.659)	1.000				
PR	(0.099)	0.224	0.052	0.061	1.000			
OCTAR	0.282	0.240	0.173	(0.474)	(0.464)	1.000		
MCR	0.159	0.073	0.559	(0.115)	0.305	(0.391)	1.000	
IFL	0.121	(0.303)	0.418	0.390	0.030	0.304	0.012	1.000

Source: NBE, Banks annual report and computed through E-view 8

Correlation measures the degree of linear association between variables. Values of the correlation coefficient are always ranged between +1 and -1. A correlation coefficient of +1 indicates that the existence of a perfect positive association between the two variables, while a correlation coefficient of -1 indicates perfect negative association. A correlation coefficient of zero, on the other hand, indicates the absence of relationship (association) between two

variables (Brook, 2014). The sample size is the key element to determine whether or not the correlation coefficient is different from zero/statistically significant. As a sample size approaches to 100, the correlation coefficient of about or above 0.20 is significant at 5% level of significance (Meyers et al. 2006). The sample size of the study was 8*10 matrixes of 80 observations which was around 100 hence the study used the above justification for significance of the correlation coefficient. Table 4.2 below shows the correlation coefficient between the dependent variables and independent variables.

The correlation between the dependent and independent variables are discussed below.

Above table 4.2, the bank size, liquidity ratio and profitability ratio was negatively correlated variable with lending rate. This correlation clearly shows that, as the bank size, liquidity ratio and profitability increases, lending rate moves to the opposite direction. This result was the same to the expectation of the study and bank size and liquidity ratio statistically different from zero/statistically significant but profitability ratio is statistically insignificant. On the other hand; bank lending rate is positively correlated with inflation rate and market concentration meaning that these variables are positively affect lending rate of Ethiopia private commercial banks. Moreover, this implies that the bank lending rate tends to move in the same direction with inflation rate and market concentration. And operating costs to total assets ratio and deposit rate was positively correlated with lending rate. This result was the same to the expectation of the study and deposit rate and operating costs to total assets ratio statistically different from zero/statistically significant.

The correlation coefficients of (0.668), (-0.325), (0.424), and (0.282) deposit rate, bank size, liquidity ratio, and operating costs to total assets ratio between lending rate the correlation coefficient of about or above 0.20 is significant at 5% level of significance these variable is statistically different from zero or greater than 0.2 and we conclude that correlation coefficient between deposit rate, bank size, liquidity ratio, and operating costs to total assets ratio with lending rate statistically significant. But the correlation coefficients of (0.121), (0.159) and (-0.099) between lending rate and inflation rate, market concentration and profitability ratio the is statistically not different from zero/statistically insignificant, because correlation coefficient of between lending rate and inflation rate, market concentration and profitability ratio the is less than 0.20.

The deposit rate was positively correlated with lending rate, indicated by the correlation of (0.668) between deposit rate and lending rate. This indicates that, when the deposit rate increases, lending rate moves to the same direction. But the effect of deposit rate on lending rate statistically significant and positive. This was same with the expectation.

Continuing to the correlations of the industry level variable market concentration has positively correlated with lending rate. The correlation for this variable was (0.159). Indicating that, when the bank concentration increases, lending rate moves to the same direction and the result was statistically insignificant. This result was opposite to the expectation. Similarly, the macro-economic variables used in this study, inflation rate had positively significant correlation with lending rate with a correlation of (0.121) respectively. As indicating that, when the inflation rate increases, lending rate moves in the same direction. The result of the variable is statistically insignificant. This was in opposite with the expectation.

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

In this study as mentioned 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 model assumptions test are presented as follows:

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

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

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

The classical assumption required for the OLS estimator to be an effective state that, the variance of error term has to be constant and the same for all observers. This is referred to as a homoskedastic error term. When that assumption is violated and the variance is different for different observation we refer to this as Heteroskedasticity, if the assumption of constant variance is violated, the standard errors could be wrong and hence any inferences made could be misleading. In general, the OLS standard errors will be too large for the intercept when the

errors are heteroscedastic. In order to test the following hypothesis White's (1980) general test for heteroscedasticity was applied.

The hypothesis for the Heteroskedasticity test was formulated as follow;

H0: The variance of the error is homoscedasticity

H1: The variance of the error is heteroscedasticity

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

$\alpha = 0.05$

Table 4.3Heteroskedasticity Test: White summary

Heteroskedasticity Test: White

F-statistic	1.919931	Prob. F(7,72)	0.0787
Obs*R-squared	12.58389	Prob. Chi-Square(7)	0.0829
Scaled explained SS	7.769592	Prob. Chi-Square(7)	0.3533

Source: E-views 8 output

As shown in table 4.3, all versions of the white test statistic (F-statistic, Chi-Square and Scaled explained SS) gave the same conclusion that there was no evidence for the presence of heteroscedasticity, since the p-values of 7.87%, 8.29% and 35.33%, for F-statistic, Chi-Square and Scaled explained SS respectively (see Appendix I for detail) were in excess of 5 percent level of significant, so the null hypothesis does not be rejected. This implies that there is no significant evidence for the presence of heteroskedasticity at 5%, in this research model.

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

It is assumed that the error terms are uncorrelated with one another. If the errors are not uncorrelated (correlated) with one another, it would be stated that they are "autocorrelated" or that they are "serially correlated". The consequences of ignoring autocorrelation when it is present are similar to those of ignoring heteroskedasticity. The coefficient estimates derived by using OLS are still unbiased, but they are inefficient, meaning that the standard errors are biased. Furthermore, the R square is likely to be inflated (Brooks C., 2014). Breusch– Godfrey tests allow examination of the relationship between error term and several of its lagged values at the same time. Therefore, to check the presence of autocorrelation in this study, the

researcher used the popular Breusch–Godfrey test.

The hypothesis for the autocorrelation test was formulated as follow:

H0: There is no autocorrelation problem in the model.

H1: There is autocorrelation problem in the model.

$\alpha = 0.05$

Decision Rule: Reject H0 if P value is less than significant level 0.05. Otherwise, do not rejectH0.

Table 4.4Breusch-Godfrey Serial Correlation LM Test summary

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.117572	Prob. F(2,70)	0.1280
Obs*R-squared	4.564031	Prob. Chi-Square(2)	0.1021

Source: E-views 8 output

On the above table 4.4, autocorrelation test, E-views offer an F-version and a $\chi 2$-version, while the second table presents the estimates from the auxiliary regression (see Appendix II for detail).the result enables to conclude from both versions of the test result in this case is do not reject the null hypothesis of no autocorrelation. Since the p-values of both F-version and a $\chi 2$ version 0.1280 and 0.1021 respectively were greater than significance level of 0.05. Thus, it can be concluded that there is no autocorrelation problem in the model.

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

According to Brooks (2014), if the residuals are normally distributed, the histogram should be bell-shaped, and also a normal distribution will thus have a coefficient of excess kurtosis of zero. One of the most commonly applied tests for normality is the Bera-Jarque (BJ) test.When the p-value given at the bottom of the normality test screen greater than 5 percent do not reject the null hypothesis that the data is normally distributed.

The hypothesis for the normality test was formulated as follow:

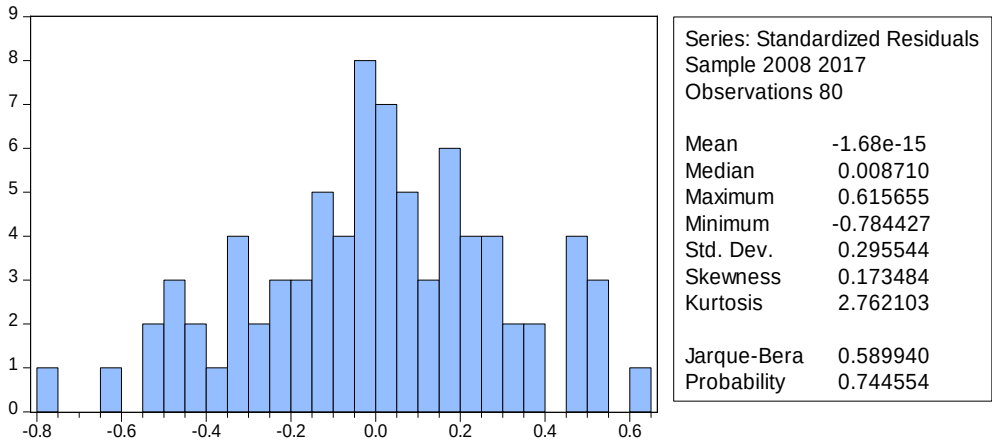
H0: the data is normally distributed

H1: the data is not normally distributed

$\alpha = 0.05$

Figure 4.1Normality test

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



Source: E-views 8 output

Figure 4.1 Indicated that distribution of the panel observation is symmetric about its mean.

As shown in the above figure 4.1 the Bera-Jarque statistic has a P-value of 0.7445 which implies that it is greater than 0.05.Which indicates that there was no evidence for the presence of an abnormality in the data. 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. It can conclude that there is no problem of normality. Furthermore, it indicates that the inferences made about the population parameters from the sample parameters tend to be valid.

4.3.5. Multi-collinearity Test result

Brooks C. (2014), states that when using the OLS estimation method the explanatory variables are not correlated with one another. If there is no relationship between the explanatory variables, they would be said to be orthogonal to one another. If the explanatory variables were orthogonal to one another, adding or removing a variable from a regression equation would not cause the values of the coefficients on the other variables to change. However, in any practical context, the correlation between explanatory variables will be non-zero, although this will generally be relatively benign in the sense that a small degree of association between explanatory variables will almost always occur but will not cause too much loss of precision. There are two classes of multicollinearity: perfect multicollinearity and near multicollinearity. Perfect multicollinearity occurs when there is an exact relationship between two or more variables. It shows the regression

model has difficulty in explaining which independent variables are affecting the dependent variable. If multicollinearity problem is too serious in a model, either additional important variable should be added or unimportant independent variable should be dropped. Hair (2006) concluded that correlation coefficient below 0.9 may not cause serious multicollinearity problem.

In addition Malhotra (2007) stated that multicollinearity problem exists when the correlation coefficient among variables is greater than 0.75 and Kennedy (2008) also suggests that any correlation coefficient above 0.7 could cause a serious Multicollinearity problem leading to inefficient estimation and less reliable results. The correlation matrix between independent variables was used in this study to test the existence of multicollinearity problem.

Table4.5: Result of Multicollinearity

	DR	LOG-BS	LR	PR	0CTAR	MC	IFL
DR	1.000						
BS	(0.504)	1.000					
LR	(0.610)	(0.659)	1.000				
PR	0.224	0.051	0.063	1.000			
0CTAR	0.240	0.173	(0.474)	(0.464)	1.000		
MCR	0.007	0.559	(0.115)	0.305	(0.391)	1.000	
IFL	0.303	(0.418)	0.390	(0.030)	(0.304)	(0.001)	1.000

Source: E-views 8 output

As it is indicated in table 4.5 the result shows that there is no strong correlation between the explanatory variables. In this result, the highest correlation coefficient is 0.659 between the liquidity ratio (LR) and bank size (log-size). Thus, it can be concluded that almost all variables correlation coefficient is less than 0.7, have low correlation power which implies no multi-collinearity problem in the model.

4.4. Model Specification test

Model specification error occurs when omitting a relevant independent variable, including unnecessary variable or choosing the wrong functional form. When the omitted variable is correlated with the variable which included, the estimators will be biased and inconsistent and model specification error will tends to occur. If the omitted variable is not correlated with the included variable, the estimators are unbiased and consistent and model specification error will not occur. Therefore, in order to select a correct estimated model, the researcher had carry out the Ramsey-RESET Test to check on the model specification.

The hypothesis for the model specification test was formulated as follow;

H0: The model specification is correct.

H1: The model specification is incorrect.

$\alpha = 0.05$

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

Table 4.6: Result of Model Specification Test

Ramsey RESET Test

Equation: UNTITLED

Specification: LIR C DR LOGBS LR PR OCTAR MCR IFL
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	1.304436	71	0.1963
F-statistic	1.701553	(1, 71)	0.1963
Likelihood ratio	1.894630	1	0.1687

Source: E-views 8 output

From table 4.6, it can be concluded that this research do not reject null hypothesis (H0),Since the p-value is 0.1963, 0.1963and 0.1687for t-statistic, f-statistic and Likelihood Ratio which is greater than significance level of 0.05. Thus, it can be concluded that the model specification is correct from year 2008 to 2017.

4.5. Model Selection (Random Effect versus Fixed Effect Models)

According to Brooks (2008), there are broadly two classes of panel estimator approaches model that can be employed in financial research: fixed effects models and random effects models. The choice between both approaches is done by running a Hausman test.

According to Gujarati (2009) if T (the number of time series data) is large and N (the number of cross-sectional units) is small, there is likely to be little difference in the values of the parameters estimated by fixed effect model/FEM/ and random effect model/REM/. Hence the choice here is based on computational convenience. On this score, FEM is preferable. Since the number of time series (i.e. 10 year) is greater than the number of cross-sectional units (i.e.8 commercial banks), FEM is preferable in this case.

4.6. Regression analysis Results and Discussions

Regression Results analysis

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

LIRi,t=B0+ B1(DRit) + B2(BSit)+ B3(LRit)+ B4(PRit)+ B5(OCTARit) + B6(MCit) + B 7(IFLt)+ Ui,t

Where;

- **β0** is an intercept,
- **β1, *β2, β3, β4, β5, β6, and β7***represent estimated coefficient for specific bank *i* at time *t* ,
- **DR it:** the average deposit rate for bank i at time t.
- **BS**$_{it}$**:**the natural logarithm of total assets for bank i at time t
- **LR**$_{it}$**:**the ratio of liquidity to total asset for bank i at time.
- **PR**$_{it}$**:** profitability ratio for bank i at time t
- **OCTAR**$_{it}$**:** operating cost to total asset ratio for bank i at time t.
- ***MCit;*** Market concentration

- **IFL**$_{it}$: inflation rate of Ethiopia at time t.
- **t:** Time (2008-2017).
- ε_{it}: Represents error terms for intentionally/unintentionally omitted or added variables.

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-value

Table 4.7 Fixed Effect panel Model Regression output

Dependent Variable: LIR
Method: Panel Least Squares
Date: 02/23/19 Time: 10:10
Sample: 2008 2017
Periods included: 10
Cross-sections included: 8
Total panel (balanced) observations: 80

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.294013	0.888408	10.46142	0.0000***
DR	0.442665	0.104319	4.243374	0.0001***
LOG_BS	-4.64E-05	5.05E-06	-9.197217	0.0000***
LR	-0.045156	0.004562	-9.898825	0.0000***
PR	-0.212525	0.093928	-2.262634	0.0270**
OCTAR	48.45923	12.24067	3.958872	0.0002***
MCR	11.72238	3.402284	3.445445	0.0010***
IFL	0.001903	0.002830	0.672499	0.5037

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.875771	Mean dependent var	0.114986
Adjusted R squared	0.849014	S.D. dependent var	0.017082
S.E. of regression	0.150987	Akaike info criterion	-0.775889
Sum squared resid	1.481805	Schwarz criterion	-0.329259
Log likelihood	46.03555	Hannan-Quinn criter.	-0.596822
F-statistic	32.73049	Durbin-Watson stat	3.194894
Prob(F-statistic)	0.000000		

***, ** and * denote significance at 1%, 5%, and 10% levels respectively.

Source: computed from E-views 8 result

Multiple regression analysis was conducted to establish the relationship between average lending rate and the independent variable.

The multiple regression equation is stated below

LIR=9.2940+0.442DR-4.64BS-0.0451LR-0.2125PR+48.45OCTAR+11.72MC+0.0019IFL+ε

The panel random effect estimation regression result in the above table 4.7 shows coefficient intercept (α) is 9.2940. This means, when all explanatory variables took a value of zero, the average value LIR would take 9.2940 unit and statistically significant at 1% of significance level.

Interpretation of R-squared

R-squared coefficient of (0.875771) obtained from the estimated model means that 87.57% of the Independent variables used to estimate the model were able to explain the dependent variable.

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

Interpretation of adjusted-R squared

The result indicates that the changes in the independent variables explain 84.90% of the changes in the dependent variable. That is deposit rate; bank size, liquidity ratio, profitability, operational efficiency, market concentration and inflation rate collectively explain 84.90% of the changes in lending interest rate. The remaining 13.10% of changes was explained by other factors which are not included in the model. Thus these variables collectively, are good explanatory variables of the loan lending rate 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 32.73which is greater than 5 hence the model

was fit for estimation (Brooks, 2014).

The regression F-statistic (32.73) 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 independent variables in the model were able to explain variations in the dependent variable. P-value of 0.000000 indicates strong statistical significance, which enhanced the reliability and validity of the model.

Interpretation of regression results

The coefficient of BS, LR and PR is -4.64, -0.0451and-0.2125, respectively. This indicates that there is negative relationship between dependent variable of lending interest Rate and independent variables of BS, LR and PR; Meaning that as banks size, liquidity ratio and profitability ratio increases, the lending interest rate of private commercial banks in Ethiopia decrease and vice versa.

However, the relationship between lending rate and deposit rate operating cost to total asset ratio, market concentration and inflation rate is positive; meaning that the increase in deposit rate operating cost to total asset ratio, market concentration and inflation rate could also increases the position of lending interest rate of private commercial banks in Ethiopia and vice versa. Accordingly, the coefficient of DR, OCTAR, MCR and IFL is 0.442665, 48.45923, 11.72238, and 0.001903, respectively. On the other hand, those independent variables coefficient sign is positive and significant effect on dependent variable except IFL is insignificant effect on dependent variable. It means that one percent changes in DR, OCTAR, MCR and IFL leads to percent change in the LIR by 0.442665, 48.45923, 11.72238, and 0.001903in the same direction, respectively.

Contrary, one percent changes in BS, LR and PR leads to percent change in the LIR -4.64, -0.0451and-0.2125in the opposite direction respectively. In terms of significance level (corresponding p-value), all explanatory variables had p-values of less than the selected significance levels (1%, 5% and 10%) except IFL.

As shown in Table 4.7 BS, LR, PR, DR, OCTAR and MCR were the statistically significant factors affecting LIR of private commercial banks in Ethiopia but IFL is do not rejected even at

10% significance level. I.e. there is statistically insignificant effect on LIR of Ethiopia private commercial banks. And BS, LR, DR, OCTAR and MCR had statistically significant effect on LIR at 1% significant level. PR had statistically significant effect on LIR at 5% significant level. As stated on introduction section of this research, the main purpose of the study was to identify the determinants of lending interest rate of Ethiopian private commercial banks and those identified variables affect lending interest rate in Ethiopian private commercial banks except inflation rate.

4.7. Hypotheses Testing

A. Deposit rate (DR)

H1: Deposit rate has positive and significant effect on lending interest rate on Private commercial banks in Ethiopia.

Table 4.7 the regression result shows that coefficient of deposit rate (DR) has positive and statistically significant effect on lending rate of private commercial bank by a coefficient estimate of 0.442665and its P-value is 0.0001.This means that holding other independent variables constant, when deposit interest rate increased by one percent, as the result the lending rate will increases by 4.42% on average, the effect is statistically significant even at 1% significant level. Accordingly, the result supported the working hypotheses that deposit interest rate has positive and statistically significant effect on lending interest rate of private commercial banks in Ethiopia for the period of 2008 to 2017. It was in line with the hypotheses (1). This result is consistent with Cihak (2004),Bhattarai, (2015) and Kaymaz and Kaymaz (2011), they found significant positive relationship with lending interest rates. But inconsistent with Samuel and Peters (2014)and Ali et al. (2016). They found that deposit rate has a significant and negatively relationship with lending rate. The deposit rate, as a cost of the basic sources of financing of bank activities, is found statistically significant in models used in the study. Moreover, the sign of deposit rate conform to the expectation and this showed that as the Commercial bank deposit rate increases definitely increase their lending rate in the bank. The

result is inline with economic theory of Loanable Funds Theory which premises a positive relationship between the bank lending interest rate and deposit interest rate as creditors pass out their input cost of funds to borrowers. loanable funds theory explains factors that influence lending rates in that if individuals do not save in banks due to low interest rates offered on deposits due to poor financial intermediation as a result of inefficiencies in banking, there will be low deposits from which banks will lend from and thus high lending rates.

B. Bank Size (BS)

H2: bank size has negative and significant effect on lending interest rate of Private commercial banks in Ethiopia.

The regression result table 4.7shows bank size (BS) is negative and statistically significant effect on lending interest rate of private commercial banks in Ethiopia since its P-value is 0.0000 and coefficient is (-4.64E-05). This means that holding other independent variables constant, when bank size increased by one percent in log of bank size, as the result the lending rate will decreases by 0.046%on average, the relationship is statistically significant even at 1% significant level. Accordingly, the result supported the working hypothesis that bank size has negative and statistically significant effect on lending interest rate of private commercial banks in Ethiopia for the period of 2008 to 2017.Meaning that bank size has statistically significant effect on lending rates of private commercial banks in Ethiopia. This result is consistent with Uchida et al., 2007, Obamuyi, 2013,Bashiri (2003),Back et al. (2009) and Georgievska et al.(2010),They found that that bank size have a significant and negative impact on the commercial bank lending rate but inconsistent with Cihak (2004),Obillo(2015),Adoa (2015). The result shows that, Bank size was a great determinant of lending rate of commercial banks as larger banks lacked the ability to offer lower lending rates as the interest spread maintained was lower compared to that of the smaller banks. Due to increased economies of scale, banks that maintain sufficient asset should benefit from their size and have lower lending rates.

C. Bank Liquidity Ratio (LR)

H3: Bank Liquidity Ratio has negative and significant effect on lending interest rate of Private commercial banks in Ethiopia.

According to Table 4.7 the regression result shows bank liquidity ratio (LR) is negative and statistically significant impact on lending rate of private commercial banks in Ethiopia since its P-value is 0.0000 and coefficient is (-0.045156). This means that holding other independent variables constant, when liquidity ratio increased by one percent, the lending interest rate will decreases by 0.45% on average, the relationship is statistically significant at 1% significant level. Accordingly, the result supported the working hypothesis that bank liquidity ratio has negative and statistically significant effect on lending interest rate of private commercial banks in Ethiopia for the period of 2008 to 2017. This result is consistent with that of Ngata &Njeru (2015). The results show that when bank total asset increase, bank lending rate moves upwards but inconsistent with Ali et al. (2016), Cihak (2004),Adoa (2015)and Okoye and Ricahrd (2013),they found that liquidity ratio have a significant and positively relationship with lending rate since they need to be compensated for keeping more liquid assets i.e. when bank total asset increase, bank lending rate moves upwards.

D. Bank Profitability (PR)

H4: Bank Profitability ratio has negative and significant effect on lending interest rate of Private commercial banks in Ethiopia.

According to Table 4.7 the regression result shows bank Profitability ratio (PR) is negatively and statistically significant impact on lending interest rate of private commercial banks in Ethiopia since its P-value is 0.0270 and coefficient is (-0.212525). This means that holding other independent variables constant, when bank Profitability ratio increased by one percent, the lending rate will decreases by 2.12% on average, the relationship is statistically significant at 5% significant level. Accordingly, the result supported the working hypothesis that bank Profitability ratio has negative and statistically significant effect on lending interest rate of private commercial banks in Ethiopia for the period of 2008 to 2017. Meaning that bank Profitability ratio has statistically significant effect on lending rates of private commercial banks in Ethiopia. The result indicates that profitable private commercial banks have low lending rate in Ethiopia context. The result is inconsistent to Bhattarai(2015),Siddiqui

(2012),Khan (2014),Obillo(2015).the result is inline with credit market theory postulates that the borrowers willing to pay high interest rates may on average be worse risks; thus as the interest rate increases, the riskiness of those who borrow also increases, reducing the bank's profitability.

E. Operating cost to total asset ratio (OCTAR)

H5: Operating cost to total asset ratio has positive and significant effect on lending interest rate of Private commercial banks in Ethiopia

The empirical finding the regression result of operating costs to total assets ratio is positive and statistically significant relationship between private commercial bank lending interest rate in Ethiopia. Since, its P-value is 0.0002and coefficient is (48.45923). This means that holding other independent variables constant, when operating costs to total assets ratio increased by one percent, the lending interest rate will increases by 48.45% on average, the relationship is statistically significant even at 1% significant level and the result is supported the working hypothesis that operating costs to total assets ratio has positive and statistically significant effect on lending interest rate of private commercial banks in Ethiopia for the period of 2008 to 2017.Meaning that operating costs to total assets ratio has statistically significant effect on lending rates of private commercial banks in Ethiopia. The result is consistent with Samuel (2018),Gambacorta (2008) ,Obillo (2015),Mbao et al. (2014), Siddiqui (2012), Okoye and Ricahrd (2013) and Karanu and Ireri (2015)they found that operating costs to total assets ratio have a positive relationship with lending rate. Operating cost increases the cost of financial intermediation which then results into higher lending rates, this is because banks may attempt to recover some of their costs. Moreover, the result is shows that high operating cost is inefficiency of the banks internal control that leading to higher lending interest rate. The result also supported by loanable funds theory, Claeys and Vander (2008) argues that the theory explains factors that influence lending rates in that if individuals do not save in banks due to low interest rates offered on deposits due to poor financial intermediation as a result of inefficiencies in banking, there will be low deposits from which banks will lend from and thus high lending rates.

F. Market Concentration (MCR)

H6: Market concentration has positive and significant effect on lending interest rate of Private commercial banks in Ethiopia.

Concerning the coefficient of the only industry specific variable the regression result shows bank market concentration (MC) has positive and statistically significant impact on lending interest rate of private commercial banks in Ethiopia since its P-value is 0.0010 and coefficient is(11.72238).Accordingly, the result supported the working hypothesis that market concentration has positive and statistically significant effect on lending interest rate of private commercial banks in Ethiopia for the period of 2008 to 2017.Meaning that bank market concentration has statistically significant effect on lending interest rates of private commercial banks in Ethiopia. Under the industry level specific characteristic, the findings show that bank concentration tends to affect private bank lending rates in Ethiopia. The Herfindahl index (HHI) which is a proxy of concentration, suggests a significant positive relationship with lending rate in models. When the level of an index is highest in the banking industry, it implies that the banking industry is highly concentrated while with low level of the index means less concentration. Therefore, the significant positive effect of the HHI on the lending rate, suggesting that as banking industry becomes more concentrated the tendency to lead higher lending rate. The result is consistent with Kinyuru(2011), Adoa (2015),Kinyuru(2011) and Cihak (2004)they found that a positive relationship with lending rate but inconsistent with Georgievska et al.(2010) the determinants of lending rates in the commercial banking sector in Greece.

G. Inflation (Ifl)

H7: Inflation rate has positive and significant effect on lending interest rate of Private commercial banks in Ethiopia.

Inflation rate has positive and statistically insignificant effect on lending interest rate of private commercial banks in Ethiopia since its P-value is 0.5037 and coefficient is (0.001903). This means that holding other independent variables constant, when Inflation rate increased by one percent, the lending interest rate will increases by 0.5037%on average, the relationship is statistically insignificant even at 10% significant level. Accordingly, the result not supported the working hypothesis that Inflation rate has positive and statistically insignificant effect on lending interest rate of private commercial banks in Ethiopia for the period of 2008 to 2017.Meaning that Inflation rate has statistically insignificant effect on lending interest rates of private commercial banks in Ethiopia. The results indicate a positive relationship between lending rates and inflation rate and it is statistically insignificant even at 10%. The result suggests that the lending rate of private banks is not sensitive to inflationary pressure but to move in same direction. This implies

that a 1% increase in inflation rate will result in 0.5037% increase in the value of the dependent variable to keep the space with the inflation and vice visa. This can be seen from the economic indicators table that, when inflation rate was 12.5,lending interest rate was 11.5 in 2008 but when in 2009 when inflation rate increase to23.8 and lending rate also increase to 12.25.

This implies that inflation rate and lending rate move in same direction. The result is consistent with Adoa (2015),Mbaoetal.(2014),Asamoah and Adu (2016),Kinyuru (2011),Ahmed (2016), Omondi (2014) and Gambacorta (2008) they found that inflation is positively related to lending rate. As inflation rate increases by one percent, the rate of lending interest rate increases by that percent. This suggests that lending interest rates change in proportion to the changing expected inflation.

Table4.8. Summary of actual and expected signs of explanatory variables on the dependent variables

Explanatory variables	Expected impact on lending interest rate	Actual impacts
Deposit interest rate	positive& Significant	Positive & Significant
Bank size	Negative & Significant	Negative & Significant
Liquidity ratio	Negative & Significant	Negative & Significant
Profitability	Negative & Significant	Negative & Significant
Operating cost to total asset ratio	Positive & Significant	Positive &significant
Market concentration	Positive & Significant	Positive &significant
Inflation rate	Positive & Significant	Positive &insignificant

Note: Sig- statistically significant; Ins- statistically insignificant

CHAPTER FIVE

5. SUMMARY OF FINDING, CONCLUSION AND RECOMMENDATION

5.1. SUMMARY OF FINDING OF THE STUDY

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

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lending rate. In doing so, previous studies on lending interest rate have been reviewed and it is summarized that the lending interest rate of bank is usually expressed as a function of internal and external determinants. The internal determinants refers to the factors originate from bank accounts (balance sheets and/or profit and loss accounts) and external determinants are variables that are not related to bank management but reflect the economic and legal environment that affects the operation and performance of financial institutions.

The literatures differ about the category of factors that had the greatest influence on lending interest rate. Some of the studies argue that the main determinants of lending rate are bank-specific factors; whereas others claim that the industry specific factor and macroeconomic factors are the most important variables that explain the level of lending interest rate. Therefore, there is a continuous debate on the key determinants of lending rate in different countries. Cognizant of the need for further research in the area, the current study had proposed a model based on literatures to analyze the effects of bank specific, industry specific factor and macroeconomic factors on lending interest rate of Ethiopian private Commercial Banks.

A number of explanatory variables have been proposed for both categories, according to the nature and purpose of each study. Studies dealing with internal determinants employ variables such as deposit rate, bank size, liquidity ratio, profitability ratio, operating cost to total asset ratio while for external determinants, market concentration and inflation rate.

To comply with the objective of this research, the paper used quantitative research method. The quantitative data were mainly obtained from the banks themselves, from NBE and MoFEC through documentary analysis in order to identify and measure the determinants of banks lending interest rate. In specific, multiple regression analysis is adopted to measure the effect of determinants on banks' lending interest rate quantitatively. This study has identified a number of variables that have important bearing on lending interest rates in Ethiopia. Both the internal (i.e. bank-specific variables) and external factors used in this study have found joint influence on lending rate. Overall results from the regression analysis estimated by random effect regression model revealed that deposit rate; operating cost to total asset ratio and market concentration had positive and significant effect on lending rate. On the other hand, bank size, liquidity ratio, profitability ratio affect lending rate of Ethiopian private commercial banks negatively. Inflation rate has positive and insignificant effect on lending rate

Generally, most of the findings were in line with postulates that bank specific variables, industry specific factor and macroeconomic variables have an impact on bank lending interest rate.

5.2. Conclusion

The empirical result of this study showed that bank size, liquidity ratio and profitability ratio had significant and negative effect on lending interest rate of private commercial banks in Ethiopia and Deposit rate and operating cost to total asset ratio had significant and positive impact on lending interest rate of private commercial banks in Ethiopia. Industry specific factor market concentration has significant and positive effect on lending interest rate of Ethiopian private commercial banks. Inflation rate is also positive and insignificant impact on lending interest rate of private commercial banks in Ethiopia.

The study specifically examines the effect of bank determinants factors on lending interest rate of Ethiopia private commercial banks based on the following conclusions.

- Deposit rate revealed positive and statistically significant impact on lending interest rate of private commercial bank in Ethiopian. In other word, Deposit rate had the direct relationship with the lending interest rate of private commercial banks in Ethiopia. The sign of deposit rate conform to expectation and this showed that as the Commercial bank deposit rate increases will definitely increases their lending rate in the bank.
- Bank size revealed negative and statistically significant impact on lending interest rate of private commercial banks in Ethiopia. The large size bank has the advantage of providing a large menu of financial service to their customers and there by mobilize more funds which will lead to serving their customers with low lending rate. Bank size was a great determinant of lending rate of commercial banks as larger banks lacked the ability to offer lower lending rates as the interest spread maintained was lower compared to that of the smaller banks. Due to increased economies of scale, banks that maintain sufficient asset should benefit from their size and have lower lending rates

- Bank liquidity ratio revealed negative and statistically significant impact on lending interest rate of private commercial banks in Ethiopia. When liquidity ratio increased by one percent, the lending interest rate will decrease by 0.45% on average, the relationship

is statistically significant at 1% significant level. When bank total asset increase, bank lending rate moves upwards and low return of highly liquid asset.

- Bank Profitability ratio revealed negatively and statistically significant impact on lending interest rate of private commercial banks in Ethiopia. Bank Profitability ratio indicator profitable banks have the capacity to implement modern Credit risk management system, technology and hiring trained man power/experts as well as having credit information access so that it contributes for low lending rate.

- Operating costs to total assets ratio is positive and statistically significant relationship between private commercial bank lending interest rate. This implies that Operating cost increases the cost of banking institution which then results into higher lending rates, this is because banks may attempt to recover some of their costs. Implies that increasing the level of inefficiency tends to increase cost. The reason is high operating costs are likely to include costs due to inefficiency leading to higher lending interest rate.

- Market concentration has positive and statistically significant impact on lending interest rate of private commercial banks in Ethiopia. This implies that significant positive effect of the HHI on the lending rate, suggesting that as banking industry becomes more concentrated the tendency to lead higher lending rate.

- Inflation rate the coefficient of inflation was positive as anticipated, but it was not statistically significant, thus, the effect of inflation on Ethiopian private banks lending rate is not significant. The findings also suggested that as inflation is not a determinant of banks lending rate in Ethiopia as far as the parameter for this variable is insignificant as illustrated by the large p-values of 0.5037. In terms of inflation impact on lending rate, previous studies of Adoa (2015),Mbaoetal.(2014),Asamoah and Adu (2016), Kinyuru(2011),Ahmed (2016),Omondi (2014) and Gambacorta (2008) showed appositive result and this implies that during the period of the study, inflations was anticipated which gave banks the opportunity to adjust the interest rates accordingly, resulting in revenuesthat increased faster than costs, with a positive impact on lending rate. Referring to previous studies, the results they found that inflation is positively related to lending rate. As inflation rate increases by one percent, the lending interest

rate increases by 0.019%. This suggests that lending interest rates change in proportion to the changing expected inflation.

Therefore, the study reached on conclusion that variables deposit rate, bank size, liquidity ratio, profitability, Market concentration and Operating costs to total assets ratio significant effect on lending interest rate of private commercial banks in Ethiopia.

5.3. Recommendations

Based on the findings of this study, the following recommendation is hereby proffered:

- The study recommends, that the selected variables are determinant factors of private commercial bank' son lending interest rate such as bank specific factors deposit rate, bank size, liquidity ratio, profitability ratio and Operating costs to total assets ratio, Industry specific factors, market concentration and macroeconomic factors inflation rate to determine lending interest rate in private commercial bank at an acceptable level except inflation rate. Based on the findings and conclusions above, the study recommends that commercial banks evaluate their lending rates properly to ensure that they have adequate loan disbursement but also high returns that would improve the financial performance. This therefore means that commercial banks need to clearly evaluate their lending rates and the costs attached to the finances so as to come up with optimal returns.

- Private commercial banks should manage their internal inefficiencies; from the regression result operating cost to total asset ratio and lending interest rate positive relationship in private commercial banks of Ethiopia. This implies that high operating costs are likely to include costs due to inefficiency leading to higher lending interest rate. The private commercial banks should give more attention in Improving cost efficiency by reducing controllable operating expenses using appropriate cost reduction strategies will help to bring bank loan price down. This can be done by moving towards multi-channel banking products such as mobile banking, internet banking, agent banking and effective utilization of Automatic Teller Machine by using those advanced technologies.

- Competition in the banking sector should be further enhanced and supported by policies that encourage and foster competition in the banking sector. Measures to promote the growth and image of small and medium sized banks, in an effort to increase their ability to penetrate markets and break dominance by few large banks.

- The study also recommends, large size bank has the advantage of providing a large menu of financial services to their customers as result Banks should try as much as possible to a balance which will help them to cover cost associated with lending and at the same time, maintain good banking relationship with their borrowers. Bank management should maintain lending rate at carefully which is essential to the safety and soundness of banking institution. Moreover, bank management should ensure that appropriate policies procedures, management information systems and internal controls to maintain lending rate at practical levels with consistency and continuity. This is Competitive advantage on economies of scale as the result large bank send loan to their customer with small landing rate

- As over all the researcher recommended to private commercial banks to incorporate fully the credit information they gather on their lending policies so as to ensure consumers with good credit ratings get competitive lending rate and don't suffer the effect of branded risky borrowers thus lacking credit or being charged high lending rates.
- Interest paid on deposits by individual banks is a major factor in private banks. The higher the interest paid on these deposit the more the lending rate will be and the smaller the interest paid the lower the lending rate will be. When banks mobilize deposit from customers, they pay interest on these deposits (i.e. saving and fixed time deposits) to ensure that deposits do not lose value over the period that the money is kept with the bank. The interest on deposits which is termed as borrowing rate is expensive for time deposits than saving deposits. Thus, commercial banks should strategize on how to attract and retain more saving deposits rather than focusing on mobilization of fixed time deposits so as to reduce interest expense thereby further improve their lending rates.

Further Research

This study concentrated on the determinants of lending interest rates on private Commercial Banks in Ethiopia. The study did not consider other factors affecting lending interest rate of private commercial banks like management efficiency, policy rate; exchange rate and Treasury bill rate and use primary data as this would help capture qualitative information that cannot be quantitatively captured in financial statements. Therefore, future studies conducted on these areas to expand the level of knowledge.

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APPENDIX

Appendix I Heteroskedasticity Test: White

Heteroskedasticity Test: White

F-statistic	1.919931	Prob. F(7,72)	0.0787
Obs*R-squared	12.58389	Prob. Chi-Square(7)	0.0829
Scaled explained SS	7.769592	Prob. Chi-Square(7)	0.3533

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 02/24/19 Time: 10:23
Sample: 2008 2017
Included observations: 80

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.278705	0.089827	3.102703	0.0027
DR^2	-0.005747	0.004128	-1.392161	0.1682
LOG-BS^2	3.37E-07	4.31E-07	0.782500	0.4365
LR^2	-4.07E-05	1.49E-05	-2.724936	0.0081
PR^2	0.586640	0.892841	0.657049	0.5132
OCTAR^2	-0.023513	0.017927	-1.311572	0.1938
MCR^2	-0.297576	0.674860	-0.440945	0.6606
IFL^2	-1.00E-05	2.27E-05	-0.442229	0.6596

R-squared	0.157299	Mean dependent var	0.068618
Adjusted R-squared	0.075369	S.D. dependent var	0.085258
S.E. of regression	0.081982	Akaike info criterion	-2.069989
Sum squared resid	0.483918	Schwarz criterion	-1.831787
Log likelihood	90.79957	Hannan-Quinn criter.	-1.974487
F-statistic	1.919931	Durbin-Watson stat	2.291673
Prob(F-statistic)	0.078710		

Appendix II : Breusch-Godfrey Serial Correlation LM Test:

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.117572	Prob. F(2,70)	0.1280
Obs*R-squared	4.564031	Prob. Chi-Square(2)	0.1021

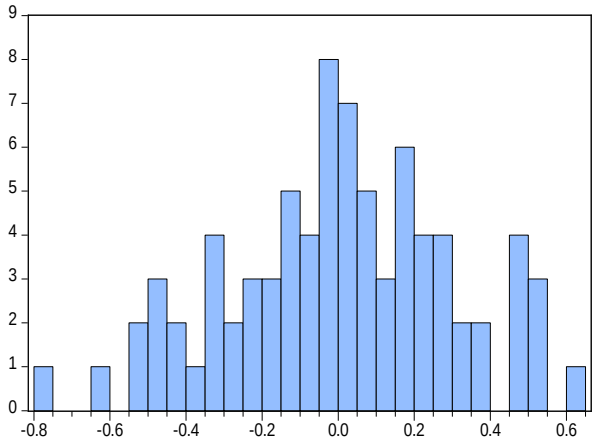
Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 02/24/19 Time: 10:52
Sample: 2008 2017
Included observations: 80
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.043580	0.550626	0.079147	0.9371
DR	-0.003985	0.092520	-0.043076	0.9658
LOG_BS	-0.000138	0.000675	-0.204029	0.8389

LR	7.49E-05	0.003554	0.021065	0.9833
PR	-0.004826	0.034728	-0.138966	0.8899
OCTAR	-0.062510	4.242618	-0.014734	0.9883
MCR	0.142965	0.767272	0.186330	0.8527
IFL	-0.000867	0.002981	-0.290961	0.7719
RESID(-1)	0.099446	0.122506	0.811763	0.4197
RESID(-2)	-0.229984	0.118507	-1.940682	0.0563

R-squared	0.057050	Mean dependent var	1.24E-16
Adjusted R-squared	-0.064186	S.D. dependent var	0.235106
S.E. of regression	0.242534	Akaike info criterion	0.121116
Sum squared resid	4.117580	Schwarz criterion	0.418869
Log likelihood	5.155362	Hannan-Quinn criter.	0.240494
F-statistic	0.470572	Durbin-Watson stat	2.006393
Prob(F-statistic)	0.889558		

Appendix III: Normality Test



Series: Standardized Residuals
Sample 2008 2017
Observations 80

Mean	-1.68e-15
Median	0.008710
Maximum	0.615655
Minimum	-0.784427
Std. Dev.	0.295544
Skewness	0.173484
Kurtosis	2.762103
Jarque-Bera	0.589940
Probability	0.744554

Appendix IV: Ramsey RESET Test

Ramsey RESET Test
Equation: UNTITLED
Specification: LIR C DR LOG-BS LR PR OCTAR MCR IFL
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	1.541976	71	0.1275
F-statistic	2.377689	(1, 71)	0.1275
Likelihood ratio	2.635204	1	0.1045

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.177877	1	0.177877
Restricted SSR	5.489464	72	0.076243
Unrestricted SSR	5.311586	71	0.074811
Unrestricted SSR	5.311586	71	0.074811

LR test summary:

	Value	df
Restricted LogL	-6.347242	72
Unrestricted LogL	-5.029640	71

Unrestricted Test Equation:
Dependent Variable: LIR
Method: Least Squares
Date: 02/24/19 Time: 11:08
Sample: 2008 2017
Included observations: 80

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	92.41273	51.31493	1.800893	0.0760
DR	-1.379619	0.836013	-1.650237	0.1033
LOG-BS	0.060076	0.035758	1.680059	0.0973
LR	0.012788	0.008644	1.479408	0.1435
PR	-35.27684	20.98219	-1.681276	0.0971
OCTAR	-2.758186	1.647433	-1.674232	0.0985
MCR	-55.29616	32.88698	-1.681400	0.0971
IFL	0.003494	0.003840	0.910045	0.3659
FITTED^2	-0.450729	0.292306	-1.541976	0.1275

R-squared	0.554696	Mean dependent var	0.114986
Adjusted R-squared	0.504521	S.D. dependent var	0.017082
S.E. of regression	0.273516	Akaike info criterion	0.350741
Sum squared resid	5.311586	Schwarz criterion	0.618719
Log likelihood	-5.029640	Hannan-Quinn criter.	0.458181
F-statistic	11.05520	Durbin-Watson stat	1.929012
Prob(F-statistic)	0.000000		

Appendix V Regression Results

Dependent Variable: LIR
Method: Panel Least Squares
Date: 02/23/19 Time: 10:10
Sample: 2008 2017
Periods included: 10
Cross-sections included: 8
Total panel (balanced) observations: 80

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.294013	0.888408	10.46142	0.0000***
DR	0.442665	0.104319	4.243374	0.0001***
LOG_BS	-4.64E-05	5.05E-06	-9.197217	0.0000***

LR	-0.045156	0.004562	-9.898825	0.0000***
PR	-0.212525	0.093928	-2.262634	0.0270**
OCTAR	48.45923	12.24067	3.958872	0.0002***
MCR	11.72238	3.402284	3.445445	0.0010***
IFL	0.001903	0.002830	0.672499	0.5037

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.875771	Mean dependent var	0.114986
Adjusted R squared	0.849014	S.D. dependent var	0.017082
S.E. of regression	0.150987	Akaike info criterion	-0.775889
Sum squared resid	1.481805	Schwarz criterion	-0.329259
Log likelihood	46.03555	Hannan-Quinn criter.	-0.596822
F-statistic	32.73049	Durbin-Watson stat	3.194894
Prob(F-statistic)	0.000000		