



ST.MARY'S UNIVERSITY SCHOOL OF GRADUATE  
STUDIES

DETERMINANTS OF LENDING RATE OF PRIVATE  
COMMERCIAL BANKS IN ETHIOPIA

By  
TADIYOS YIMAM

June, 2018  
ADDIS ABABA, ETHIOPIA

DETERMINANTS OF LENDING RATE OF PRIVATE  
COMMERCIAL BANKS IN ETHIOPIA

By  
TADIYOS YIMAM

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

JUNE, 2018  
ADDIS ABABA, ETHIOPIA

**ST. MARY'S UNIVERSITY**  
**SCHOOL OF GRADUATE STUDIES**  
**FACULTY OF BUSINESS**

**DETERMINANTS OF LENDING RATE OF PRIVATE  
COMMERCIAL BANKS IN ETHIOPIA**

**By**  
**TADIYOS YIMAM**

**APPROVED BY BOARD OF EXAMINERS**

---

**Dean, Graduate Studies Signature**

---

**Advisor Signature**

---

**External Examiner Signature**

---

**Internal Examiner Signature**

## DECLARATION

I, the undersigned, declare that this thesis is my original work, presented under the guidance of Asmamaw Gete (Asst.prof). All sources of materials used for the thesis have been duly acknowledged. I further confirm that the thesis has not been submitted either in part or in full to any other higher institution for the purpose of earning any degree.

\_\_\_\_\_  
Name and Signature

**June, 2018**

**St. Mary's University, Addis Ababa Ethiopia**

## ENDORSEMENT

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

---

Advisor Signature

st. Mary's University, Addis Ababa, June, 2018

## Contents

DECLARATION .....	iv
ENDORSEMENT .....	v
LIST OF TABLES .....	ix
LIST OF FIGURES .....	x
ACKNOWLEDGMENT .....	xi
LIST OF ACRONYMS .....	xii
ABSTRACT.....	xiii
CHAPTER ONE .....	1
INTRODUCTION .....	1
1.1. Background of the study .....	1
1.2. Statement of problem .....	3
1.3. Objectives of the study.....	4
1.3.1. General Objective .....	4
1.3.2. Specific Objectives .....	4
1.4. Significant of e of the Study .....	5
1.5. Scope of the study .....	5
1.7. Organization of the Study .....	6
CHAPTER TWO .....	7
LITERATURE REVIEW .....	7
2.1. Introduction.....	7
2.2. Bank Lending Rates.....	7
2.3. Conceptual Classification of Interest Rate.....	7
2.4. Theoretical Framework .....	8
2.4.1. Loan Pricing Theory .....	8
2.4.2. Theory of Multiple- Lending .....	8
2.5. Theory of interest rate .....	8

2.5.1.	Loan able funds theory.....	8
2.5.2.	The rational expectations theory of interest rate .....	9
2.5.3.	The Classical Theory of Interest Rates .....	9
2.5.4.	Liquidity Preference Theory .....	10
2.5.5.	Credit Market Theory.....	11
2.6.	Empirical Study .....	13
2.6.1.	Bank Specific Variable .....	15
2.6.2.	Industry Specific Variable .....	17
2.6.3.	Macroeconomic Variables .....	18
2.7.	Summary and Knowledge Gap .....	20
2.8.	Conceptual framework of the study .....	21
CHAPTER THREE .....		23
RESEARCH METHODOLOGY .....		23
3.1.	Introduction.....	23
3.2.	Research Design.....	23
3.3.	Research Approach .....	23
3.4.	Source and Methods of data collection .....	24
3.5.	Sample and Sampling technique .....	24
3.6.	Model Specification and Description Variable .....	26
3.6.1.	Model Specification .....	26
3.6.2.	Description Variable .....	27
3.7.	Method of data analysis .....	32
3.8.	Diagnostic tests .....	32
3.8.1.	The errors have zero mean ( $e(\epsilon) = 0$ ) .....	32
3.8.2.	Test for Heteroskedasticity (variance of the errors must be constant) .....	33
3.8.3.	Test for Autocorrelation (covariance between the error terms over time is zero) .....	33
3.8.4.	Test for Normality (Errors are normally distributed).....	33
3.8.5.	Test for Multicollinearity (independent variables are highly correlated) .....	33
CHAPTER FOUR.....		35

DATA ANALYSIS AND PRESENTATION .....	35
4.1. Introduction.....	35
4.2. Descriptive statistics .....	35
4.3. Correlation Analysis .....	38
4.4. Tests for the Classical Linear Regression Model (CLRM) assumptions .....	39
4.4.1. The errors have zero mean ( $E(u_t) = 0$ ).....	39
4.4.2. Heteroscedasticity Test .....	40
4.4.3. Test of Autocorrelation .....	40
4.4.4. Test of normality.....	41
4.4.5. Test of multicollinearity.....	42
4.4.6. Model specification test .....	43
4.5. Results of Regression Analysis and its Interpretation.....	44
4.5.1. Interpretation of R-squared, adjusted R-squared and F-statistic .....	46
4.6. Interpretation Results of the Regression Values .....	46
4.6.1. Bank-Specific factors of lending rate.....	47
4.6.2. Industry specific factors of lending rate.....	49
4.6.3. Macroeconomic-Specific factors of lending rate .....	50
CHAPTER FIVE .....	53
CONCLUSIONS AND RECOMMENDATIONS .....	53
5.1. Summary of the findings.....	53
5.2. Conclusion .....	54
5.3. Recommendations.....	56
5.4. Recommendation for future research.....	57



## **LIST OF TABLES**

Table 1-Variable Classification, measurements and expected sign

Table 2-Descriptive Statistics of dependent and independent Variables

Table 3-Correlation Matrix (With Dependent variable)

Table 4-Heteroskedasticity Test

Table 5-Regression result Durbin-Watson

Table 6-Breusch-Godfrey Serial Correlation LM Test (summary)

Table 7-Correlation Matrix between independent variables

Table 8-Result of model specification Test

Table 9-Regression result

Table 10- Summary of actual and expected signs of explanatory variables on the dependent variables

## **LIST OF FIGURES**

Figure 1-Conceptual models of determinants of lending rate

Figure 2- Test of normality

Figure 3-Relations between lending rate and GDP in Ethiopia

## **ACKNOWLEDGMENT**

My heartfelt thank goes to the Almighty God and his mother St. Marry, who follow me in all aspect of my life.

First, I would like express my deepest gratitude to my advisor ,Asmamaw Gete (Asst.Prof), for his support, encouragement, invaluable comments advice and guidance at various stages of the my study.

I would also like to convey my sincere thanks to my parents, whose unconditional love and silent prayers encouraged and protect me throughout my life.

Finally I would like to thank my entire friend for their immeasurable assistance though outmy study.

## LIST OF ACRONYMS

ARCH	Autoregressive Conditional Heteroscedasticity
BC	Bank concentration
BG	Breush-Godfrey
BS	Bank Size
CIA	Central intelligence Agency
CLRM	Classical Linear Regression Model
CR	Credit Risk
DW	Durbin-Watson
GDP	Gross domestic product
HHI	Herfindahl-hirschman index
INF	Inflation
IR	Interest Rate
MoFED	Ministry of Finance and Economic Development
NBE	National Bank of Ethiopia
Oc	Operating cost
OLS	Ordinary least square
RR	Reserve Requirement

## **ABSTRACT**

*This paper investigates the determinants of lending rate in Ethiopian private commercial banking sector. The study used unbalanced panel data collected from annual reports of eight commercial banks operating in Ethiopia during the period 2002 to 2016. Lending rate is determined by bank, industry and macro-economic related factors. A quantitative research approach and explanatory design were adopted in carrying out this research. Secondary data were collected from selected banks using purposive sampling technique. Model Based mainly on the Seminal Ho and Saunders, 1981 dealership model and extensions theories, the study employed panel data estimation techniques to analyze the influence of bank, industry and macroeconomic factors on lending rate. The analysis conducted using the econometric package Eviews 8. The study results show that bank size, operating cost and deposit rate have a positive and significant impact on bank lending rate. Credit risk, bank concentration and GDP have a negative and significant effect on lending rate. However reserve requirement and inflation is not significant for the determinant of lending rate. The study recommends banks to improve operational efficiency, NBE to instill competition within banks and policy makers to promote favorable economic situation. Further studies were recommended in the areas by considering additional variables and considering newly emerging banks.*

**Keyword: Lending rate, bank, industry and macroeconomic Variables**

# CHAPTER ONE

## INTRODUCTION

### 1.1. Background of the study

Financial institutions play critical role in the efficiency and growth of an economy through optimal allocation of resources. They provide platform for continuous restructuring of the economy through reallocating financial resources to the fastest growing sectors. Financial systems allocate financial resources across sectors and range of projects over time (Mishkin, 2004).

Economic development critically centered on patterns and levels of resource mobilization and allocation in the country. Resources are mobilized through savings which at the level of macro economy for the allocation of resources for the purpose of consumption and investment. Similarly, investment depends critically on banking credit and the underlying lending system which enables investors to borrow for the purpose of investing in real capital to enhance existing businesses or for establishment of a new business entity. In this way banking credit contributes to the generation of economic activity and eventually leads to higher national income and growth. Therefore, all economic players including households, businesses and public sector are sensitive towards the efficient flow of resources from surplus to deficit units (Afzal, 2011).

In order to conduct resource allocation between excess and deficit financing unit banks charge interest rate from borrower. Interest rate is one of the important terms in the lending decision process of commercial banks. Commercial banks are independent business entities that set their own lending rates. 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 (Sheriff & Amoako, 2014).

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 rate. 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 not only for specific banks but also to policy makers, the banking industry and the public at large (Yoga, 2015).

In general, empirical studies that examine the determinant 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, structure of the balance sheet, non-interest income or non-core revenues, bank size, 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 inflation rate. Some studies focus on one category of the factors while others consider two or all the three categories of the factors (Yoga, 2015).

Determinants of lending interest rate in commercial bank have often been a subject of unclear topic through banks executives and other interested users. The main concern of is that the lending rate in Ethiopian commercial banks is relatively high when we compare with average lending rate of other countries in the world(CIA,2018).

Banking industry in Ethiopia is still growing and it should ensure that effective strategies are put in place to minimize lending interest rate to encourage investments and others individuals. Moreover, the interest rates charged on lending by commercial banks have been a sensitive to the lending unit and policy maker. The objective of this study is to investigate the determinant factors that influence lending interest rates in Ethiopian commercial banks. As a result, this study focuses on the individual bank-specific factors, macroeconomic and industry factors of determinant of lending rates. The results of this study may enable bank executives as well as policy makers to understand the factors affecting lending interest rate. Furthermore the result will valuable to set appropriate and reasonable lending interest rate for borrowers which is valuable for economic development of the countries.

## 1.2. Statement of problem

In order to make efficient flow of resource and economic stability of a given country, lending rate has a great role. Lower lending rates in the economy help businesses to improve and growth. It occurs because firms can easily access funds to expand their business at a cheaper rate; furthermore Individuals also access funds for mortgages and other personal development (Afzal, 2011).

Interest income on loans and advances still remain to be a major source of revenue to the banks income portfolio followed by investments in government securities. Obviously, any major changes in the lending rates consequently influences the interest income earned by a bank hence a shift in the bank's income statement (Ruth, 2014).

In line with the research studies that have been conducted on determinants of lending rate and interest spread , there are different studies examined this issue in different level of economies and different countries. In developed economies (Alidu, 2012; Adoah, 2015; Branko, 2014 and Khushbakht, 2014). In developing countries (Zulfiqar, 2016; Ljupka, et al., 2010; Yuga, 2015; Ruth, 2016; Fridah, 2011 and Mohamed, 2016) conduct the studies on determinant of lending rate. (Ibrahim, 2014; Dorothy, 2013 and Moses, 2014) conducted their studies on determinants of interest rate spread.

Generally the studies conducted in different countries and different economies environment shows that lending rate affected by bank specific, industry specific and macroeconomic specific variable, but it shows deviation on the results due to different economic environment maintained with the countries. For instance the research conducted by Ljupka (2010) shows that Operating cost has no effect on lending rate in Macedonia commercial banking sector, it is different from Yuga(2015) the result shows operating cost has positive and significant impact for the determinant of lending rate in Nepalese commercial banks , furthermore Alidu (2012) found that GDP has positive and significant impact on lending rate in commercial banking sector in Ghana , it was inconsistent with Adoah (2015) the result indicated GDP has negative and insignificant impact on lending rate in Kenya banking sectors . Therefore, further empirical evidence could provide additional insight about the determinants of lending rate by using much recent dataset, Quantitative research approach and it needs further investigation.



In Ethiopian context as per the researcher knowledge there is no study conducted on the determinants of lending rate, rather there were few research conducted surrounding the area by Aregu(2014) and Meshesha (2016)title focused on determinant of Interest spreadand determinant of interest margin in Ethiopian banking sectors respectively .The studies were not address the effect of deposit interest rate and bank size on interest spread and net interest margin.

According to Central Intelligence Agency, CIA (2018) average lending rate of other 191 countries shows that 10.38 % and 10.60% for the year 2016 and 2017 respectively. On the other hand average lending rate of Ethiopia indicated that 12% and 13% for the year 2016 and 2017 respectively, without incorporating the current period lending rate adjustment made on Ethiopian banking sectors as a result of minimum deposit rate rose from 5% to &7%(NBE Directive, 2017).

However, numbers of studies had been investigated on the determinants of lending rate in different countries. There was limited research conducted on the area in commercial banks in Ethiopia. Therefore there is a gap on literature on the different factors that are contributed for the determinant of lending rates among commercial banks in Ethiopia. This study therefore seeks to fill the existing knowledge gap investigating on the determinants of lending rates in commercial banks in Ethiopia.

### **1.3. Objectives of the study**

As per the above mentioned problem the study has the following general and specific objectives

#### **1.3.1. General Objective**

The general objective of this study is to examine the determinants of private commercial banks' lending rate in Ethiopia.

#### **1.3.2. Specific Objectives**

To achieve the above general objective, the researcher has set the following specific objectives;

- To examine the effect of bank specific variable on lending rate.
- To examine the effect industry specific variable on lending rate.

- To examine the effect of macroeconomic variable on lending rate

#### **1.4. Significant of e of the Study**

- ❖ First ,the study create better understanding for investors regarding with industry ,internal and macroeconomic factors that can affect lending rate set by the banking sectors, it create a good opportunity for investors to see in different direction for his better investment decision in line with the source of finance.
- ❖ Second, the study will show the significant level of different dependent variable for the determination of lending rate in commercial banks. Due to such fact it play a great role for the banking sectors at the time of planning to revise lending rates other than depending only industry average lending rate and deposit rate to revise their lending rate.
- ❖ Third, the study makes a contribution to existing literature and future researcher as follows; currently, majority of scholarly works in this field focused on the interest rates spread. Since interest rates spread is just the different between the lending rates and the deposit rates .There has been unclear understanding for the determination of lending rate, as a result it create better understanding to know the major variable that are significant effect for bank lending rate decision.
- ❖ Lastly the policy makers will find this study to know the major factors affecting lending rate and to conduct further research which is relevant for the stabilization of the country economy.

#### **1.5. Scope of the study**

There are eighteen commercial banks in Ethiopia both public and private which are fully engaged in commercial banking activity. But, to make the study becomes more manageable and meaningful furthermore, public bank my not show the clear determinants variable of lending rate ,due to the fact that the lending rate set by governmental banks highly influenced by government policy and objectives to attract or encourage investors .As a result the scope of the

study focused on eight private commercial banks, such as (Awash bank, Dashen bank, Bank of Abyssinia, Wegagen bank, United bank , Nib International Bank, Lion international Bank and Cooperative Bank of Oromia ) which are partially and fully operating from the year 2002-2016 .The major reasons for eight commercial banks were selected based on their experience in the industry and the banks had more than 80 % share in terms of profit as per 2016 annual report. Furthermore, the study focuses on bank specific, industry specific and macroeconomic specific variable that affects lending rate.

### **1.6. Limitation of the study**

The researcher analyzes Bank specific, internal and macroeconomic specific factors of determinant lending rate of eight commercial banks in Ethiopia. The generalization of the results of the broader context from eighteen commercial banks in Ethiopia can be one limitation of the study. Unavailability of relevant and up to date published literatures particularly on Ethiopian context, due to the fact that the study is new for the country .Furthermore absence of consistent and well organized information from each source of data affects the outcome of this paper.

### **1.7. Organization of the Study**

This study is organized in five chapters. The first chapter is deals with background to the study, statement of the problem, research objectives, research hypothesis, significant of the study and scope of the study organization of the study. Chapter 2 provides the literature review which has composed of theoretical and empirical research. Chapter 3, deals about methodology of the research, presents the research design employed, the sampling, data collection methods, and the data analysis method and technique. Chapter 4 presents analysis results and findings of the study. Lastly, Chapter 5 deals about conclusion and recommendation.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1. Introduction**

This chapter presents critical reviews regarding with the determinants of lending rates of commercial banks. The review covers conceptual, theoretical framework, empirical literature and conceptual framework. It concludes with an overview of the literature highlighting the research gap that the study seeks to fill.

#### **2.2. Bank Lending Rates**

Borrowing and lending in the financial market depend to a significant extent on the rate of interest. In economics, interest is a payment for the services of capital. It represents a return on capital. In other words, interest is the price of hiring capital. While the necessity of charging interest on credit has been widely accepted, there seems to be plenty of disagreement over the level of interest rate charged by financial providers because the factors that go into these calculations are not well known. This poses a problem of ascertaining what determines interest rates set by financial. It is widely suggested that cost of funds of financial institutions, operating expense contingency reserves (provision for bad loans) are among some of the determinants of interest rates set by the financial institutions. Others suggest that tax expense, profits earned by banks, inflation rates and competition are some are some of the determine interest rates set by financial institutions (Alidu, 2012).

#### **2.3. Conceptual Classification of Interest Rate**

Interest rate is the price paid on money borrowed within a given period of time (Anyanwu, 1999). Most of the time interest rates vary according to the term of maturity, and this gives rise to the term structure of interest rates. There are different classifications of interest rates. Interest rates can be classified as nominal or real. The nominal interest rate is inclusive of inflation. When the nominal interest rate is adjusted for inflation, it becomes real interest rate (Pandey, 1999). Nominal interest rates are higher than real interest rates.

## **2.4. Theoretical Framework**

### **2.4.1. Loan Pricing Theory**

The loan pricing theory indicates that high lending rates are always set by banks. According to Ruth (2016) commercial bank should consider the moral hazards and adverse selection problems should be considered in the credit market when maximizing interest income given the high credit market information asymmetry. If banks set high lending rates, these triggers adverse selection problems in the market as borrowers who are risky accept high rates willingly. Upon receiving the loans and advances, borrowers may develop moral hazard behavior since they are likely to take projects or investments which are highly risky. From this reasoning, it is usual that in some cases, we may not find that the interest rate set by the bank as commensurate with the risk of the borrowers as Ruth state. Under this theory, the main parameters are the cost of cost both the direct and the indirect cost of bank's activity, the risk involved in lending and the term of the loan. This theory is therefore relevant to this study in that by trying to adjust the interest rates, commercial banks affect the pricing determinants of the loans they lend to the public thus affecting the total cost of the loan able funds. This in turn affects the loan uptake by the borrowers which eventually affect the lending business of the banks.

### **2.4.2. Theory of Multiple- Lending**

The theory of multiple-lending is applied through loan syndication. Loan syndication is an arrangement where banks jointly raise finance to honors loan applications. It is usually beneficial where there the loan amount is higher than and exceeds the lending capacity of the banks considered separately. Loan syndication helps boost the lending capacity of banks (Ngugi, 2001).

## **2.5. Theory of interest rate**

### **2.5.1. Loan able funds theory**

According to this theory, the supply and demand of loan able funds or excess bank reserves is the main determinant of interest rates. In situations where the demands for loan exceed the supply of loans, interest rates will rise in the favor of Banks, and to the disadvantage of borrowers. This theory builds upon the classical theory of interest rate by recognizing the fact that money supply

significantly influences saving and investment. The market interest rate (the cost of credit) is determined at the rate that equates the supply of loans to the demand of loan (Ngugi, 2001).

Loan able funds theory has implication on bankers', savers and borrowers. According to this theory, this group should be well compensated at the equilibrium. Interest rate on loan should be structured in a way that every party feels comfortable (Ngugi, 2001).

### **2.5.2. The rational expectations theory of interest rate**

This is based on the idea that people formulate expectations based on all the information that is available in the market. Rational expectation theory holds 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 or changes in economic factors. The rational expectations theory can be incorporated with the loan able funds theory in order to better consider the available information within the economy. The limiting factors of rational expectation theory are mostly related to the difficulty in gathering information and understanding how the public uses its information to form its expectations (Caplan, 2000) argued. If expectation of the people is that the interest will go up many people will avoid borrowing, this in return will affect bank performance due to reduced earning on the interest rate, but if people expect interest rates to drop people would be willing to borrow and this will improve bank performance due to increase in the interest rate earning (Bekaert, 1998).

### **2.5.3. The Classical Theory of Interest Rates**

Interest, in real terms, is the reward for the productive use of capital, which is equal to the marginal productivity of physical capital. In a money economy, however, as physical capital is purchased with monetary funds, the rate of interest is taken to be the annual rate of return over money capital invested in physical capital assets.

According to Keynes, true classical theory of interest rate is the savings investment theory. Basically, the theory holds the proposition based on the general equilibrium theory that the rate of interest is determined by the intersection of the demand for and supply of capital. (Caplan, 2000) argued that an equilibrium rate of interest is determined at a point at which the demand for

capital equals its supply. Demand for capital stems from investment decisions of the entrepreneur class. Investment demand schedule, thus, reflects the demand for capital, while the supply of capital results from savings in the community. Savings schedule, thus, represents the supply of capital. It follows that savings and investment are the two real factors determining the rate of interest (Friedman & Kuttner, 1991).

The implication of the theory, different banks have different liquidity, if what stated in the theory is true high liquid bank should charge low interest rate on funds lend in order to attract more borrowers and interest rate on savings should be low in order to discourage savings or if it charges the same rate as other banks on money borrowed then interest rate on saving should remain very low. If that is true interest rate spread on highly liquid banks should be comparatively more than low liquid banks. Financial performance on comparatively high liquid bank should be better than low liquid bank (Friedman & Kuttner, 1991).

#### **2.5.4. Liquidity Preference Theory**

According to this theory, investors will always prefer short term securities to long term securities. To encourage them hold long term bonds, long term securities should yield higher interests than short term bonds. Therefore, the yield curve will always be upward sloping. Hypothesis about the term structure of interest rates (the relationship between interest rates and term to maturity) holding that investors demand a premium for bearing interest rate risk. The extent of the premium increases with term to maturity but at a decreasing rate. The two reasons behind the decreasing rate of increase are that duration, a measure of a bond's price sensitivity to interest rate changes, increases at a decreasing rate with term to maturity and that long term interest rates are typically less volatile than short term interest rates. (Fridah, 2011)

Commercial banks determine the interest rate in the credit market by marking up the central bank's base rate, and then supply credit at this rate to those borrowers whom they consider to be creditworthy. Banks are therefore price makers and quantity takers, within the limits given by credit worthiness. Again, the willingness of firms and households to pay the rate of interest set by banks in the credit market is a necessary, but not a sufficient condition to obtain credit, and there will always be some sort of 'credit rationing' for those who are unable to provide required collateral. The commercial banks' mark-up on the base rate is determined by their risk and

liquidity considerations, and also by the degree of competition in the commercial banking sector. In this approach, liquidity preference determines the structure of interest rates, and not the level of interest rates. The commercial banks' liquidity preference is a determinant of the mark-up and hence the spread between the base rate and the market rate of interest. If liquidity preference and risk considerations of private banks and, hence, their markups remain constant, the central bank's interest rate setting in the base money market also determines the market rate of interest in the credit market. Under these conditions, changes in the base rate and in the credit market rate of interest are due to changes in the monetary policy stance. Changes in the central bank's base rate will therefore also shift the credit supply curve and affect credit demand and hence real economic activity financed by credit. However, if commercial banks' liquidity and risk considerations or the degree of competition, and hence their mark-ups, change in the face of a changing base rate of interest, monetary policy may not be able to determine the credit market rate of interest directly. Here an asymmetry may arise: An increasing base rate of interest will always trigger an increasing credit market rate, because commercial banks have to recover costs of refinancing and have to gain (minimum) profits. But a decreasing base rate may not be followed immediately by a falling credit market rate, if commercial banks' liquidity and risk premium increase due to rising uncertainty, or if banks' profit aspirations increase. Note finally, that the horizontality view does not imply that monetary policy is free to set the rate of interest at whatever level, irrespective of economic conditions. On the contrary, modern central banks have used the interest rate tool in order to stabilize inflation – and/or the exchange rate, depending on the exchange rate regime (Fridah, 2011).

### **2.5.5. Credit Market Theory**

This theory argues that the terms of credits clear the credit market. Given that the loan securities remain unchanged, the only price system that can clear the credit market is the interest rate. With the rising demand for credit at a given loan and advances supply by the banks, the interest rate can only rise if the credit market is clear, and vice versa. It is therefore believed that the higher the interest premium of the borrower, the higher the default risks Ewert et al., (2000) to compensate against any possible losses. The increase in demand for credit notably arising from low interest rates as a result may cause depreciation of currency. Central bank therefore must



review the interest rate to contain the high demand for loans thus discouraging borrowing. As a result, commercial banks will respond by increasing interest rates leading to low demand for loans in the long run. Within the credit market theory, the main two parameters are the bank income and loan's interest rate.

The seminal works of Klein (1971), Monti (1972) and Ho and Saunders (1981), have inspired numerous studies to analyze commercial banks' loan pricing decisions. Klein (1971) and Monti(1972) postulated a theory of banking firm and demonstrated how in a static setting demands and supplies of deposits and loans simultaneously clear both markets. The banking firm framework has been further explored by Zarruk (1989) and Wong (1997). Zarruk found that when the deposit supply function becomes more volatile, the bank's spread narrows, which implies a decline in the quality of the bank's assets. Wong pointed out that marginal administrative cost of loan is one the key factor in determining the interest rate spread. Carbó and Rodríguez (2005) developed the theoretical model by including both traditional and non-traditional activities, with the aim of studying the effect of specialization on bank margins in Europe using a multi-output model. For this purpose, they used a dynamic model taking into account the fact that banks needed to match the random supply of deposit with the random demand of lending and non-traditional activities.

Ho and Saunders (1981) developed a dealership model in which banks were assumed to be risk-averse utility maximizing intermediaries for collecting deposits and granting loans over a single-period. Transaction uncertainty arising due to the asymmetry between the supply of deposits and demand for loans and market power were considered two significant factors driving interest margins. Ho and Saunders (1981) also empirically estimated the model for the U.S. banks, using a two-step approach. In the first step, a regression model explained bank interest margin in terms of bank-specific factors such as implicit interest rate, opportunity cost of reserves, default premium, operating costs, and capital-asset ratio. The constant term of this regression represented an estimate of the 'pure spread' component for the banks, i.e. the portion of the margin that cannot be explained by bank-specific characteristics. In the second stage, they estimated a regression of pure spread against variables reflecting macroeconomic factors. The inclusion of a constant term in second step aimed at capturing factors that are neither bank-specific nor macroeconomic in nature but attributable to market structure and risk aversion.

McShane and Sharpe (1985), Allen (1988) and Angbazo (1997) have extended and modified the dealership model to a greater extent. McShane and Sharpe (1985) considered interest uncertainty from loan and deposit returns to money market rates. Allen (1988) extended the model for various types of loans with interdependent demands. Angbazo (1997) introduced credit and interest rate risk and interaction between the two into the theoretical model. The dealership model has been criticized on the grounds that it failed to recognize the bank as a firm having a certain production function associated with provision of the intermediation services (Lerner, 1981). The presence of cost inefficiencies associated with the production process across banks can have a negative effect on the margin. Thus, Maudos and de Guevara (2004) made an interesting contribution while expanding the theoretical model by considering the importance of operating costs, market power (Lerner index) and providing a detailed description of the link between riskiness and the margin. Their model specifically differentiated between market risk and credit risk, as well as their interaction as separate factors affecting the margin. The model was then estimated empirically for the main European banking sectors in the period 1992-2000. The opportunity cost variable is approximated, by the yield on Government securities investment. This variable is included in the profitability equation to reflect the substitution effect among different bank assets, and more specifically to capture the impact of changing remuneration conditions of substitutable assets for the traditional loans granted by banks (the assets for which banks are price-takers). The expected effect of this variable on bank net margin is unknown (Wong, 1997) and depends on the position (net lender or borrower) of the bank in the money market (Angbazo, 1997).

## **2.6. Empirical Study**

Various studies have revealed various determinants of lending rate, according to whether they are bank specific, industry specific or macroeconomic environment. However, other literature related to the identified financial regulation in addition to the other three classifications. In other literature, determinants of lending rate have been categorized into two this are inside (internal) and outside (external) factors. The internal factor related to the variables that affect the banking industry within while the external factors relate to the legal and economic conditions that affect the performance of the banking industry from outside. A number of explanatory variables have been projected for both categories, according to the nature and reason of each study.

From the review of existing literature, it is observed that the key drivers of bank lending rates in especially developing countries are operational costs, the effects of financial control, non-competitive in the banking industry. Similarly, when there are dominant banks with large market power there is a high tendency for them to manipulate industry variables, and for that matter, they could drive lending rate high by their market power (Agu 1992; Barajas et al, 1999; Brock and Rojas Suarez, 2000). Wong (1997), note that interest margin (lending rate) is positively correlated to banks market power, operating cost, credit risk and the degree of interest rate risk.

According to Mensah and Abor (2014) that determinants of bank lending rate may be caused 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 and higher deposit rates; they also tend to have lower interest margins (Ho and Saunders, 1981). Thomas et al (1981) state that, developed bank interest margin model in which the bank was viewed as a risk –averse dealer. They show that interest margins the result of the transacting uncertainly face of the bank and would always exist. They also found out that margin depends on four factors; the degree of managerial risk aversion, the size of transaction undertaken by the bank, bank market structure and the variance of interest rate. It has also been identified by various studies that macroeconomic factors contribute significantly to the determinants of the bank lending rate. As per the observation from the study conducted by Chirwa and Mlachila (2004) that macroeconomic variables, typically through to be determinants of interest rate include inflation, growth of output, money market and real interest. They further identified that macroeconomic instability and the policy environment have an important impact on the pricing behavior of the universal bank loan. They noted that interest rate uncertainties, exchange rate of universal banks, public sector loan are necessary determinants of interest rate. In different empirical study determinant of lending rate generally categorized in to three industry, macroeconomic and industry specific variable

### **2.6.1. Bank Specific Variable**

There is a considerable degree of consensus that the quality of management makes the difference between sound and unsound bank. As this variable is measured by the Cost Income ratio, an increase of these ratios means a deterioration of management efficiency and will result in a decrease in the net interest rate ( Sarpong Winful and Ntamoah, 2011).

According to Yuga (2015); Ljupka (2010); Alidu (2012); Adoah (2015) & Aregu (2014) ROA and default risk, management efficiency and Liquidity ratio had positive and significant impact on lending interest rate and interest spread. On the other hand operating expense has significant and negative impact for the determinant of lending rate (Yoga, 2015) .which was different from Ljupka (2010) the study result shows that operating expense has insignificant impact on lending rate.

Mensah,(2005) maintain that variation in overhead and operating cost are reflected in the variation in bank interest rate as the bank will pass their operating cost on to deposits and lenders. Bawumia et al (2005), indicates that high operating cost which is mainly due to labor costs and bank's determination to maintain high profit margin are the two bank specific factors which contribute significantly to the wider bank interest rate.

Mensah,(2005) stated that the quality of bank management affects profitability. They again state that an increase in this variable has negative impact on interest rate because an increase in the ratio implies a decrease in efficiency, hence a reduction in net interest rate. Bawumia et al (2005) also found that continual increase in intermediation spreads in developing countries is to a large extent driven by in operational cost. As the bank's cost of operations rise, they pass the burden to consumers through higher lending rates, and lower the deposit rate if prudent. Thus, they make customers bear the burden of the internal inefficiency, and this is not justifiable.

Bawumia et al (2005) state that the incidence of fraud, the ease with which bad credit risk survive due diligence and the state of corporate governance within bank have the potential of increase asset deterioration, operating costs and ultimately interest rate .

Bank size is also considered as an important determinant of banking lending decision. Uchida et al (2008) provide that large and complex bank tends to lend few loans to small scale firm, Stein

(2000) explains that small bank has comparative advantages in producing soft information whereas large bank have comparative advantage in lending based.

Bashiri (2003) also states that, 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. Beck and Hesse (2006) finds some evidence that large banks in Uganda charge lower lending rate (due to scale economies).

Credit risk is critical since the default of a small number of important customers can generate large losses which can lead to insolvency or high lending rate because of this bank will find a way of shifting the cost to their customers thereby increasing the lending rates.

The Professional Associations of Banks in Ghana in a paper state that the judicial systems in deliver judgment to commerce cases are quite laborious and costly. In case of loan default it becomes very costly for banks take legal action to enforce the realization of the security package. Such costs are at times factored into the pricing of the credit to the borrower.

In the works of Bawumia et al (2005) they suggest that adverse selection and adverse incentive (moral hazard) effects which could result in mounting non-performing loans and provision for doubtful debts also affect the way universal banks price their loan. Banks that are financially distressed lost the lending capacity since them less liquid, and prone to insolvency. Similarly, Karim, Azman – Saini A, (2011) also found that the banks' loan supply is dependent on banks' liquidity level, and thus there is a positive relationship between bank liquidity and bank loan supply.

Olusanya et al (2012) examines the determinants of universal banks' lending behavior in Nigeria case found that foreign exchange rate, investments in a portfolio, deposit and liquidity ratio have a positive impact on universal banks' lending volume whiles the coefficient of lending interest rate and minimum cash reserve ratio were negative.

In addition, bank relationship with the customer also plays a greater influence on the price behavior of bank lending rate, Chodechai, (2004) state that bank' lending decisions influenced by the past relationship with the borrowers which enable banks to have more accurate understanding of the borrowers business and financial situation.

In the works of Demirguc-Kunr and Huizinya (1999) identified that better contracted enforcement, the efficiency of the legal system and lack of corruption are associated with lower interest margin. This implies that developing economies will have a wide margin, due to inadequate legal system, weak contract enforcement and high level of corruption. It was also observed by Chirwa, and Mlachila(2004) that high interest spread in developing economies will persist if financial sector returns do not significantly alter the industry and macroeconomic environment within which the banks operate.

A borrower's collateral can have a major impact on the interest rate charged by a lender. Collateral places the lender in a more secure financial position. In the event that the borrower doesn't repay the loan, the lender can force the sale of the collateral in order to recoup any losses incurred. This lessens the risk to the lender, which result in reduced interest rate.

### **2.6.2. Industry Specific Variable**

The industry specific factors variable do not vary over bank, but vary over time. According to Buchs and Mathisen (2005), a competitive banking system is required to ensure that banks are effective for financial intermediation to channel saving into investment to fostering high economic growth. Rose and Hudgin (2008), Das and Ghosh, (2007) and Jimene and Suriani(2006) the study result shows that when the competition are high it tends to reduce the difference between the lending rate and borrowing rate. If the determinants of spread are held constant the rate between borrowing and deposit will reduce as competition increase which will force management to find a new ways of generating revenue to make up for the eroding earning. This has also been collaborated by Ngugi, (2001) who points the empirical results shows that market imperfection have wide bank interest rates. Stigtz & Hleiss (1981) revealed that imperfect competition in the banking industry as a result of asymmetric distribution of information and wealth distortions have significant influence on banking interest rate.

In the work of Berger & Hannah (1989) state that the structure of the market determines the rate that banks charged. In an industry where the market concentration is high and is controlled by few players, those players will exploit the market and charge monopolistic rent. On the other

hand, if the players in the market are much the ability to charge monopolistic rent will reduce resulting in low lending rate.

Several indicators have been used in literature to capture market structure in the banking industry. These indicators include; the Herfindahl index, the Lerner index, the three largest bank concentration ratio and five largest bank ratio. Amidu and Wolfe (2012) view that conventional and funded adjusted Lerner Index (proxy market power) exhibit positive correlation with lending rate in the developing countries. However, according to Bain (1951) state that concentration in the market will result in collusion which enable the player in the industry to pay less on their liabilities and charge high on their assets result in increase in lending rates.

According to Yuga (2015); Alidu (2012); Adoah (2015) & Aregu (2014) reserve requirement, Bank size and Market concentration had positive and significant impact on lending interest rate and interest spread.

### **2.6.3. Macroeconomic Variables**

In addition to the bank specific factors, banks also keep sense on the economic environment when setting their lending rates. Macroeconomic conditions have been observed as one of the most important factors that explain the variation of the banks' lending rate. A study conducted by Aisen and Franken (2010) suggests that macroeconomic condition is the most important determinant source of variation in cost of credit. It was also confirmed by Chirwa and Mlachila (2004) that macroeconomic instability and the policy environment in which banks found them to be having an important impact on the way universal banks set their lending rate. Their findings suggest that most important factors of macroeconomic factors that affect the lending rate are inflation, GDP and the money market real interest rate. Macroeconomic condition also has an impact on the performance of the banking industry by influencing the ability of borrowers to pay their loan. Unstable macroeconomic condition in the country and with poor economic growth affect the return of in the investor's investment and these lead to high rate of lending rate as the level of non-performing loans increase and the banks must factor these non-performing into the lending rate.

Undoubtedly, an unsound macroeconomic and policy situation is perceived as more unsafe and banks may recompense for it by requiring wider margins which lead to high lending rate.

According to Yuga (2015); Ljupka(2010); Adoah (2015) &Aregu (2014) Treasury bill rate, policy interest rate and interest rate volatility had positive and significant impact on lending interest rate and interest spread. However, GDP rate has negative and significant impact on lending rate (Adoah,2015) .The result which was different from the study conducted by Alidu(2012); the study shows that GDP has significant and positive impact on the determinates of lending rate

Gambacorta (2004)according to his view, the rates that banks set on their loan have positive correlation with GDP growth and inflation. In a situation where there is an increase in economic condition in a particular country, Project that appears not to be profitable venture become profitable when discounted at the present time. This means that an increase in economic conditions will result in an increase in demand for loan which will lead to high rate on the loan. On the other hand, if the economic condition leads to low demand for credit because many people now have money with them will result in low demand for credit will lead to low leading rate. When the economy is flourishing, it pushes up demand for deposit and therefore the banks have no incentive to increase deposit rates. Economic cycles significantly influence the operation and performance of banks. Talavera, Tsapin and Zholid (2006) observed that during periods of economic boom, banks make out supplementary loans than during periods of economic recession. In further support of this observation, De Young, Gron and Wnton, (2005) explained that banks make more loans during periods of economic boom because during such periods, businesses make huge profits, more investment opportunities open, and thus demand for lending (additional funding) increases.

It was also found in the work of Mansor (2006), that there is a positive relationship between GDP and bank credit for an increase in GDP growth will result in an increase in the demand for loan.

Looney and Frederiken (1997), Suggest that two main effects occur with government borrowing, which are the crowding out or the complementary effect. Crowding out is a situation where government participation in the economy is active such that the government out-competes the private sector.



Exchange rate fluctuations, specifically, currency depreciation in a home country result in bank asset being valued less in foreign currencies as against their liabilities. In the works of Lindgren et al. (1996), found that the fluctuation in the exchange rate is a prime cause of poor performance of bank borrowers which subsequently affect bank profitability. This situation is more certain in developing economies which are exposed to foreign trade. Excessive exchange rate variation weakens economic and financial growth in a country and is seen to be the most significant cause of the banking crises in a lot of counties. In the developing and open economy like Ghana one expects that exchange rate depreciation will negatively affect the bank lending rate. According to Aboagye et al. (2005) and Bawumia et al (2005) found a positive relation between inflation and the net interest rate, suggesting that the improvement in the macroeconomic environment in term lower inflation rate translates to lower net interest rate.

Treasury bill rate is also another variable which affects the bank lending rate. Treasury bill rate is the instrument, in which government uses to borrow, and such financial investment option is risky free and such liquid investment instrument influence the determination of interest rate and as such, a risk premium is added to the Treasury bill rate to compensate for the risks interest in credit.

Ngugi (2001) identifies asymmetric response to the Treasury bill rate where lending rates increase with the Treasury bill rate and become sticky downward when the Treasury bill rate declines. The professional Association of banks in Ghana indicate in a that the decision for banks to set their lending rate is influenced by the following factors; Central bank reserve requirement, Earnings on reserves, Policy rate, Projected turn over on a customer account, duration of deposit, Treasury' bill rate and Macroeconomic condition like inflation exchange rate (Mensah, 2005).

## **2.7. Summary and Knowledge Gap**

In general, empirical studies that examine the determinants of bank lending rate variables use basically fall in to three major categories: those are (1) individual bank-specific factors such as operating or administrative costs, non-performing loans, return on assets, capital of the banks, bank size, bank liquidity, among others; (2) factors specific to the banking sector/industry such as the degree of competition or market concentration, regulatory requirements such as

reserve requirements and market share ,(3) macroeconomic indicators which include real gross domestic product (GDP) growth rate and inflation.

However, there is no universally accepted findings for the determinants of lending rate, since, countries differ each other by their economic, financial, regulatory and operating environments. For instance the research conducted by Ljupka (2010) shows that Operating cost has no impact for the determinant of lending rate in Macedonia commercial banking sector, it is different from Yuga (2015) the result shows that operating cost has positive and significant impact for the determinant of lending rate in Nepalese commercial banks , furthermore Alidu (2012) found that GDP has positive and significant impact on lending rate in commercial banking sector in Ghana , it was inconsistency with (Adoah, 2015 ) the result indicated on the study GDP has negative and insignificant impact on lending rate in Kenya banking sectors . Therefore, further empirical evidence could provide additional insight about the determinants of lending rate by using much recent dataset, Quantitative research approach and it needs further investigation.

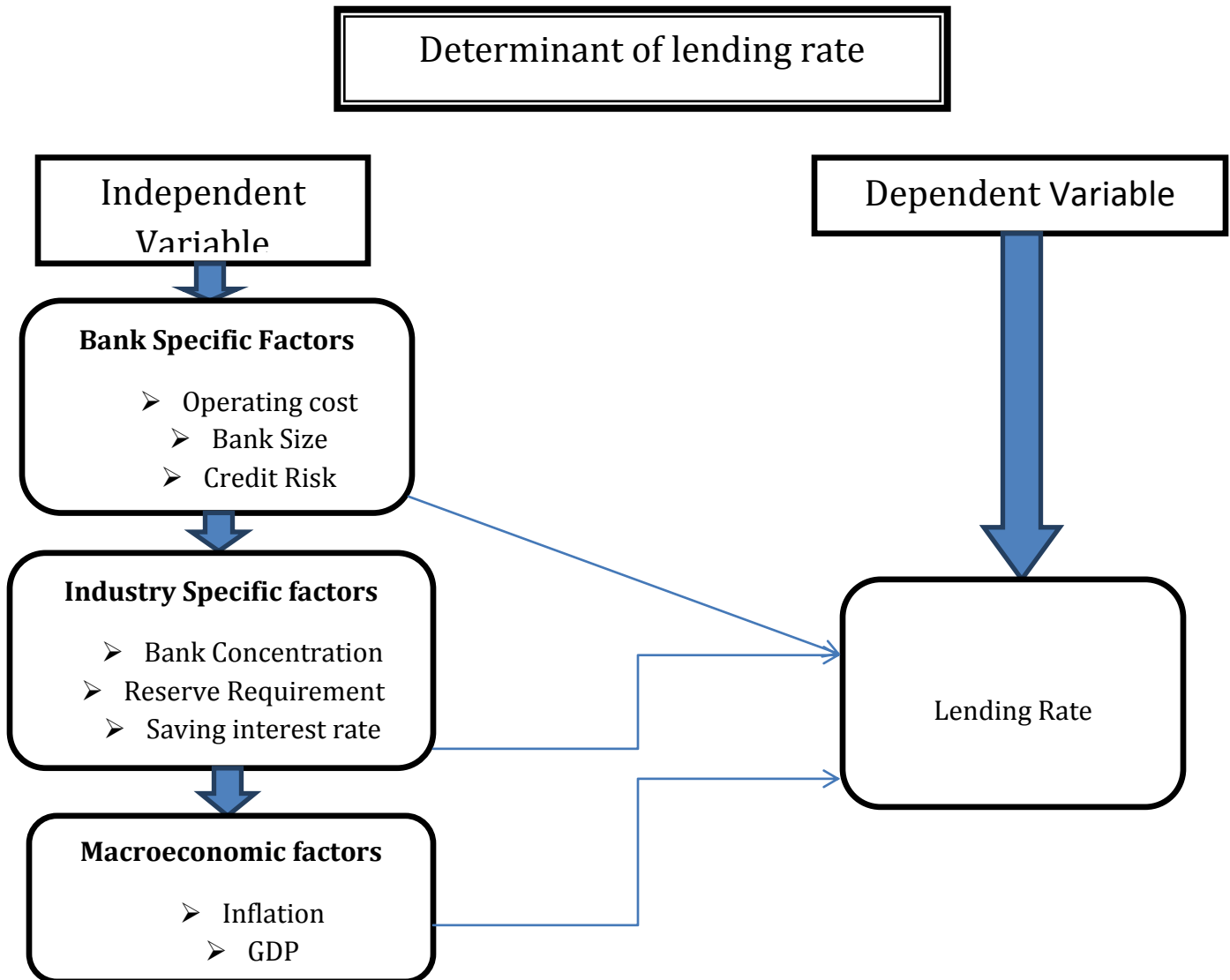
In Ethiopia there were limited researches conducted on the area of lending rate those studies the result of the studies depicted below.

Furthermore in Ethiopian context as per the researcher knowledge there is no study conducted on the determinants of lending rate, rather there were few research conducted surrounding the area by Aregu (2014) and Meshesha (2016) title focused on determinant of Interest spread and determinant of interest margin in Ethiopian banking sectors respectively .The study were not address the effect of deposit interest rate and bank size on interest spread and net interest margin Therefore, this study incorporated some of significant variable which are valuable effect for the determinant of lending rate such as bank size and deposit interest rate

## **2.8. Conceptual framework of the study**

In this section a simplified conceptual framework figures3shows the relationship between lending rate, itsexplanatory variable such as various banks, industry and macroeconomic determinants.

**Figure 3. Conceptual framework**



## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1. Introduction**

In the previous chapter presented literature and the existing empirical evidence on the Bank specific, Industry specific and Macroeconomic determinants of lending rate and identified knowledge gaps. Consequently, this chapter gives a detailed description of the methodology used to carry out the study. The chapter discusses about model specification, the variables used and diagnostic tests to be conducted. The chapter also presents the data presentation and analysis plan. A summary of the main points is also provided at the end of the chapter. The chapter is arranged as follows. Section 3.2 and 3.3 presents research design and research approach. Then, section 3.4 and 3.5 present's source and method of data collection and sample and sampling techniques respectively. Finally, section 3.6, 3.7 and 3.8 presents model specification and description of variables, method of data analysis and diagnosis testing respectively.

#### **3.2. Research Design**

Research design is a master plan specifying the methods and procedures for collecting and analyzing the required data. The choice of research design depends on objectives that the researchers want to achieve (Kothari, 2004).

This study used explanatory research design. As noted by (Kothari, 2004) explanatory research design examines the cause and effect relationships between dependent and independent variables. Therefore, since this study examined the cause and effect relationships between lending rates and its determinant, the study deploy explanatory research design.

#### **3.3. Research Approach**

This study used Quantitative approach; it is the best approach to test hypotheses and to identify factors that influence on outcome (Creswell 2013). Quantitative approach specifies how and why the variables are interrelated and why independent variable, influence or affect a dependent

.Therefore quantitative approach better provides and explain cause and effect relation. Quantitative approach can be expressed in terms of quantity and attempts to avoid bias in measurement by using standardized measurement tools in interpretation by using defined data categories. It measures what happens (objective) rather than how someone feels about what happens (subjective).It tests a sample and generalize a population often reduces and restructures a complex problem to a limited number of variables (Creswell 2013). In short the quantitative approach tends to avoid subjectivity.

### **3.4. Source and Methods of data collection**

This study used secondary panel data from Ethiopian commercial banks between 2002 and 2016, for fifteen years. Eight banks operating in Ethiopia during the period under the study were included in the panel data set. The researcher prefers to use panel data since panel data can take heterogeneity among different units into account over time by allowing for individual-specific variables. Besides, by combining time series and cross-section observations, it gives more informative data. Furthermore, panel data can better detect and measure effects that simply cannot be observed in pure cross-section or pure time series data (Gujarati, 2004) and panel data models provide much more insights because it is theoretically possible to isolate the effects of specific effects and actions (Hsiao, 2003).

The researcher used secondary data that are panel in nature. A secondary source of data was preferred by the researcher since it is less expensive in terms of time and money. And also, it gives an opportunity to collect high quality data (Saunders et al., 2007) cited in (Belay, 2015).The data collected helps to address the relation between dependent variable of lending rate and independent variables such as operating cost, Bank size ,Credit Risk, Bank Concentration, Reserve Requirement, Deposit interest rate, inflation rate and Gross domestic.

Accordingly, secondary data was obtained from annual reports and statement of accounts of the selected banks and other macroeconomic date acquired from MoFED.

### **3.5. Sample and Sampling technique**

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 (Hafiz, et al., 2007). A sample is drawn to overcome the constraints of covering the entire population with the intent of generalizing the findings to the entire population. As of March 2018, there are eighteen banks in Ethiopia. From those two of them are state owned banks, such as commercial bank of Ethiopia (CBE) and Development bank of Ethiopia, the remaining sixteen banks are private banks, those are Awash international bank (AIB), Bank of Abyssinia (BOA), Wegagen bank (WB), United bank (UB), Nib international bank (NIB), Dashen bank (DB) , Cooperative bank of Oromia, Lion international bank, Zemen bank, Oromia international bank, Buna international bank, Berhan international bank, Abay bank S.C, Addis international bank S.C, Dehub global bank S.C and Enat banks ([www.nbe.et](http://www.nbe.et)).

As noted by Kothari (2004), good sample design must be viable in the context of time and funds available for the study. Besides this, the researcher used purposive sampling technique. The samples are selected based on the date of establishments which are much more experienced in the industries as well as the sample banks had more than 80% of market share interims of profit from the total private banks assets. However, the two state owned banks are disregarded from the sample, due to the fact that government banks are established to meet the government and the public objectives as a result they may not show the clear determinants of lending rate, due to such fact that the two state owned banks are excluded from sample. As a result eight commercial banks are selected as a sample from the total number of eighteen Commercial banks. Such as Awash bank, Dashen bank, Bank of Abyssinia, Wegagen bank, United bank Nib International Bank, Lion international Bank and Cooperative Bank of Oromia. The study employed fifteen years unbalanced panel data from 2002-2016 consecutive periods. The researcher selection criteria for the starting period was as of 2002 there was an adjustment on minimum saving rate from 6% to 3%, as a result average lending rate reduce from 12% to 10%, furthermore within 2002 to 2016 saving rate adjusted for three times, accordingly average lending rate also adjusted in three time with in a period .Based on that the periods incorporated critical economic situation as a result its relevant to conduct a study.

## 3.6. Model Specification and Description Variable

### 3.6.1. Model Specification

Ho and Saunders (1981) developed a dealership model in which banks were assumed to be risk-averse utility maximizing intermediaries for collecting deposits and granting loans over a single-period. Taking inspiration from the theoretical literature, empirical studies have applied a variety of econometric models. Broadly, the factors concerning the loan pricing can be summarized under four broad categories: (i) bank specific factors (ii) institutional, policy and regulatory factors (iii) market structure, and (iv) Macroeconomic factors

The researcher used the multiple linear regression and ordinary least square (OLS) estimation method. Modeling is based on panel data techniques. Panel data 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 (2002-2016).

$$\text{Lrate}_{it} = \alpha + \beta_1 \text{OC}_{it} + \beta_2 \text{BS}_{it} + \beta_3 \text{CR}_{it} + \beta_4 \text{HHI}_{it} + \beta_5 \text{RR}_{it} + \beta_6 \text{IR}_{it} + \beta_7 \text{INF}_{it} + \beta_8 \text{GDP}_{it} + \varepsilon_{it}$$

Where:

$\beta_1, \beta_2, \beta_3, \dots, \beta_8$  = Represent coefficient of variables

$\alpha$  = Constant Term

$i$  = Represent Bank

$t$  = Represent Time

$\varepsilon_{it}$  = Represent remaining disturbance term (Error Term).

Oc = Operating cost

BS = Bank Size

CR = Credit Risk

HHI = Market Concentration

RR = Reserve Requirement

IR = Interest Rate

INF = Inflation

GDP = Gross Domestic Product

## 3.6.2. Description Variable

### 3.6.2.1. Dependent Variable

The dependent variable used in this study was the lending rate. Lending rates are the price that a borrower paid when taking loans from banks (Alidu, 2015).

These have an impact on the borrower and the lender separately. Literature has shown that high lending rate have implication on both borrower and the lender. On the part of borrower high lending rate scare them because borrowing at a high rate will be difficult for them to settle their obligation. The bank is also view that operation cost and the cost of providing efficient service is high, for example, with the current situation the operating cost is increased due to the current market fluctuation, in order to compensate and to get profit they have to pass on to the customers in form high lending rate (Alidu, 2015). Van de Heuve (2000) state that for banks to continue in trade, their total income must be more than the total cost of their operation which implies that banks must charge to cover their high cost. Average Lending rate can be measured by the following formula.

$$\text{Lending rate (Average)} = \frac{\text{Total interest income}}{\text{Aggregate debt outstanding}}$$

### 3.6.2.2. Independent Variable

#### Bank Specific Variables

Bank specific variables include: operating cost, Bank size bank and credit risk

#### Operating Cost (OC)

Operating cost is measured by the ratio of overhead costs to total assets. Overhead costs include salaries and other administrative expense including wages, other staff costs, motor vehicles, premises, depreciation on fixed assets and other noninterest expenses. If a bank incurs high overhead costs in the process of providing services then it is likely to charge a higher lending rate to sustain its overall profitability (Brock and Suarez, 2000; Ramful, 2001; Maudos and Guevara, 2004; Khan and Khan, 2010; Afzal, 2011; Were and Wambua, 2013).



## **Bank size (BS)**

Bank size is also considered as an important determinant of banking lending decision. Uchida et al (2008), Berger & Udell (2006) provide that large and complex bank tends to lend few loans to small scale firm, Stein (2000) explains that small bank has comparative advantages in producing soft information whereas large bank have comparative advantage in lending based. In addition, large and complex banks are able through technical expertise to process soft information about small scale firms, which lend to a positive relationship between bank size and lending rate. Large size bank has the advantage of providing a large menu of financial service to their customers and thereby mobilize more funds which will lead to serving their customers with low lending rate. Beck and Hesse (2006) finds some evidence that large banks in Uganda charge lower lending rate (due to economies scale).

## **Credit risk (CR)**

Non-performing loans to total loans ratio is used as an indicator of credit risk or quality of loans. Credit risk belongs to the group of factors with the highest impact on banks 'interest margins. An increase in provision for loan losses implies a higher cost to compensate bad debt write offs. Given the risk-averse behavior, banks facing higher credit risk are likely to pass the risk premium to the borrowers. Hence the higher the risk, the higher the pricing of loans and advances to compensate for likely loss (Maudos and de Guevara, 2004; Maudos and Solis, 2009; Khan and Khan 2010; Were and Wambua, 2013; Ahokposi, 2013).

## **Industry specific variable**

Industry specific variables are Market Concentration and Reserve requirement.

### **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. However, Gambacorta (2004) is of the view that market concentration in the banking industry on lending rate can be ambiguous. A concentration

that makes banks behave in an oligopolistic manner will lead 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. The HHI is expressed as  $HHI = \sum (Id/Td)^2$  Where, Id individual banks deposit and Td is the total industrial deposit. In this particular context, 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).

### **Reserve requirement (RR)**

Prescribed reserve requirement is measured by the deposit reserve requirement ratio required by the National Bank of Ethiopia and it included as a market determinant of banking sector interest margin; as such reserves reflect a burden associated with operating in the banking sector. A positive correlation between such reserves and interest is expected, as high liquidity reserve requirements act as an implicit financial tax by keeping interest rates high. Chirwa and Mlachila (2004) explain by noting that, the opportunity cost of holding reserves at the central bank, where they earn no or little interest, increases the economic cost of funds above the recorded interest expenses that banks tend to shift to customers. They further argue that the large pool of resources created by high reserve requirements allow for the financing of high fiscal deficits, and thereby creates an environment of high inflation and persistently high intermediation margins ( Tennant, 2008). Therefore, a positive relationship between reserve requirement and interest rate is expected.

### **Saving interest rate**

Deposit interest rate is one of monetary policy instrument set by the given country central bank.

It serves as to collect money from the market to reduce inflation. On the other hand when deposit rate is raised lending rate also increase, due to the fact that banks serve as intermediaries between excess and deficit financing units. Banks' increase lending rate in order to compensate interest payment made to depositor which is valuable to keep the interest margin between lending interest rate and deposit rate (Uchidaetal, 2008).

## **Macroeconomic variables**

Macroeconomic variables employed in this study are GDP, Deposit rate and Inflation; Macroeconomic variables represent factors that influence business performances in the economy and the capacity for a loan payment. These variables are taken into account when pricing a loan. An unsound macroeconomic condition is perceived as more unsafe and banks may compensate for it by setting high lending rate (Uchidaetal, 2008).

## **Inflation**

According to (Alidu, 2015) inflation is expressed 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. Inflation affects banks because they typically deal in nominal financial instruments which make up the bulk of bank assets and liabilities. In smooth operating credit market, banks can easily adjust the nominal interest rate when they need to but frictions create obstacles that make this adjustment difficult. Since empirical studies have shown that credit market frictions are more severe in developing countries than developed countries, these frictions may play an important role in explaining the impact inflation has on economic growth in these countries(Alidu, 2015).

An adverse effect on economic growth through the banking industry as a result of high inflation is to reduce the level of funding available for businesses. High inflation can reduce the real rate of return on assets. Lower real rates of return discourage saving, but encourage borrowing. Wheninflation 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 and equity markets. 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 banks lend to their customers reduces as inflation increase. This variable is expected to be positively correlated with lending rate (Boyd & Champ, 2006).

## GDP Growth

GDP growth represents the total economic activities in the economy and it is commonly used as an economic indicator. This variable is calculated as an annual average percentage of growth of GDP and it is expected to have a positive / negative impact on bank lending rate. An increase in this variable means an increase in the purchasing power of the individual in the country and this will result or enable the borrowers to settle their obligation. That is payment of their loan. It will also result in the ability of the individual to increase their savings. If an decrease in GDP result in low demand for loan and increase in the saving it will lead to low level of interest rate in the banking industry, but if the increase in GDP lead to higher demand for loan because investors or individual have more fund and can afford huge amount of loan this will result in an increase in the rate that banks charge. This is because the demand for loan is high and banks will take advantage by increasing their lending rate (Alidu, 2015).

**Table 1 Variable Classification, measurements and expected sign**

Classification	Variables	Measurement	Expected sign
Dependent Variable	Lending Rate	Interest income/Loan Amount	NA
Bank Factor	operating cost (OC)	Non-Interest Expense /Total asset	positive
	Bank size	Natural Log of Bank total asset	positive
	Credit Risk(CR)	Provision on Loan/Average Total loan	positive
Industry specific variables	Bank Concentration (HHI)	Bank Deposit/Total banks deposit	positive
	Reserve Requirement(RR)	Required reserves at central /Total assets	positive
	Annual saving interest rate	Annual NBE Min saving interest rate	positive
Macroeconomic variables	Annual inflation growth rate(INF)	inflation growth rate(CPI)	Negative
	Annual Real GDP growth rate (RGDP)	Annual Real GDP growth	positive

Source own source

### **3.7. Method of data analysis**

As noted by (Kothari, 2004), data has to be analyzed in line with the purpose of the research plan after collection. A multiple linear regression model was used to determine the relative importance of each independent variable in influencing lending rate. The multiple linear regressions model were conducted and thus Ordinary Least Square (OLS) is applied by using Eviews 8 econometric software package, to test the casual relationship between the banks' lending rate and their potential determinants and to verify the most significant and influential explanatory variables affecting the lending rate of Ethiopian banks.

As it mentioned above, for this study OLS were used. Therefore, before the regression was run tests for fulfillment of the basic Classical Linear Regression Model (CLRM) assumptions were tested. As noted by Brooks (2008) there are basic assumptions required to show that the estimation technique, OLS, had a number of desirable properties, and also hypothesis tests regarding the coefficient estimates could validly 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. Therefore, for the purpose of this study, diagnostic tests are performed to ensure whether the assumptions of the CLRM are violated or not in the model. Therefore, the basic CLRM assumptions tested in this study were the errors have zero mean, hetroskedasity, autocorrelation, normality and multicollinearity.

### **3.8. Diagnostic tests**

Diagnostic tests was undertaken in order to check the validity of the model and fulfill the assumption of the Classical Linear Regression Model

#### **3.8.1. The errors have zero mean( $e(\epsilon) = 0$ )**

As long as a regression model has a constant term, this assumption will never violate. Thus models we estimated are in line with this assumption (Brooks, 2008).

### **3.8.2. Test for Heteroskedasticity (variance of the errors must be constant)**

According to Brooks (2008) the variance of the errors must be constant (Homoscedasticity). If the error terms do not have a constant variance, said to be Heteroscedasticity. Heteroscedasticity test is very important because if the model consists of heteroskedasticity problem, the OLS estimators are no longer BEST and error variances are incorrect, therefore the hypothesis testing, standard error and confident level will be invalid. The Study used Autoregressive Conditional Heteroscedasticity (ARCH) to test the presence of heteroscedasticity.

### **3.8.3. Test for Autocorrelation (covariance between the error terms over time is zero)**

This is an assumption that is made of the CLRM's disturbance terms is that the covariance between the error terms over time (or cross-sectional, for that type of data) is zero. In other words, it is assumed that the errors are uncorrelated with one another. If the errors are not uncorrelated with one another, it would be stated that they are auto correlated 'or that they are serially correlated'. A test of this assumption is therefore required. This test can be made through Breusch-Godfrey (BG) Serial Correlation LM Test, which is a more general test for autocorrelation up to the  $r^{\text{th}}$  order. In this case the researcher tried to make fourth order autocorrelation test (Woolridge ,2004).

### **3.8.4. Test for Normality (Errors are normally distributed)**

One assumption of classical linear regression model (CLRM) is the normal distribution of the residual part of the model. As noted by Woolridge (2004), OLS estimators are BLUE regardless of whether the  $u_i$  are normally distributed or not. If the disturbances ( $u_i$ ) are independently and identically distributed with zero mean and constant variance and if the explanatory variables are Constant in repeated samples, the OLS coefficient estimators are asymptotically normally distributed with means equal to the corresponding  $\beta$ 's.

### **3.8.5. Test for Multicollinearity (independent variables are highly correlated)**

The term multicollinearity refers to the existence of a "perfect," or exact, linear relationship among some or all explanatory variables of a regression model (Gujarati, 2004). If it exists the

remedy is to drop a variable with a high R-square or do nothing. The correlation matrix was used to detect the presence of severe multicollinearity. A correlation coefficient is high if it is in excess of 0.8.

## CHAPTER FOUR

### DATA ANALYSIS AND PRESENTATION

#### 4.1. Introduction

The preceding chapter presented the research methods implemented in the study. The purpose of this chapter deals with the results and analysis of the findings and it contains three sections. The first section presented descriptive and correlation analysis on variables of the study; the second section presented fulfillment of the classical linear regression model (CLRM) assumptions; the third section laid down the results of regression that constitute the main findings of this study.

#### 4.2. Descriptive statistics

Table 2 provides a summary of the descriptive statistics of the dependent and independent variables for eight commercial banks for a period of fifteen years from year 2002-2016 with a total of 112 observations. The table includes the mean, standard deviation minimum, maximum, and number of observations for the dependent variable (Lending rate) and independent variables (operating cost, Credit Risk, Bank size, Bank Concentration, Reserve Requirement, inflation rate, Gross domestic, and Deposit interest rate).

**Table 2-Descriptive Statistics of dependent and independent Variables**

	Mean	Median	Maximum	Minimum	Std. Dev.	Observations
<b>LR</b>	0.100853	0.099705	0.151897	0.039370	0.023850	112
<b>BC</b>	0.025947	0.012566	0.154369	0.000000	0.031465	112
<b>BS</b>	3.571988	3.622917	4.471433	2.110590	0.517418	112
<b>CR</b>	0.029838	0.026116	0.098273	0.000000	0.020638	112
<b>DR</b>	0.040714	0.040000	0.050000	0.030000	0.008875	112
<b>GDP</b>	0.105547	0.105671	0.135341	0.074000	0.015933	112
<b>INF</b>	0.147215	0.104464	0.552413	-0.012219	0.145179	112
<b>OC</b>	0.031643	0.030515	0.076023	0.010620	0.008781	112
<b>RR</b>	0.142254	0.108958	0.891473	0.009363	0.107412	112



**Source: - Annual report of sample banks computed using E-views 8**

As per the above table all variables comprised 112 observations and the bank lending rate measured by the ratio of interest income on loan to total loan. In this study lending rate indicate that the Ethiopian banks earn, on average 10.08%, with a minimum of 3.94 % and a maximum of 15.18 %. This means the lower lending rate charges by the banks were 3.94 % the major reasons for this rate was new entrance banks lend their loan to staff in the form of either overdraft or emergency loan with zero interest rate, due to the fact that external customers were low until introducing themselves and raise their market share in the form of deposit. On the other hand the maximum lending rate charges by the banks were 15.19%.standard deviation of 3.15% it indicates that the lending rate variation from the mean.

Regarding with OCit was measured by non-interest expense to total asset ratio. The average bank operating cost spent by the sampled banks were 3.16%, with the minimum of 1.06% and maximum of 7.6%. This implies most banks from the sample on average incurred 3.16 percent operating expenses to provide their financial services. In other words the bank incurred 0.0316 cents as operating expenses to deliver their financial service. Standard deviation of .87 % it indicates that the operating cost ratio variation from the mean was low it was below one percent.

Credit risk it was measured by the ratio of non-performing loans to total loans ratio. The average credit risk faced by the sampled banks was 2.98%. This indicates that, from the total loan granted to customer on average, 2.98% are non-performing loan. The highest credit risk faced by the commercial banks was 9.83%, this implies there were low asset quality due to the fact that the rate above the standard level set by NBE, on the other hand the minimum credit risk faced by banks was 0% this percent indicate that the new banks might be give low lending as a result of low saving volume, due to such fact the credit risk approach to zero percent. The standard deviation was 2.06% which indicates low variation from the mean value.

Furthermore, bank size which was measured by logarithm of total bank asset .Bank size has an average of 3.57, maximum of 4.47 and the minimum of 2.11.Bank size variation from the mean was .52 .Which implies that the largest bank size has the value of 4.47 and the smallest size indicate that 2.11 the size variation from the mean was under one which was 0.52 it indicates that there was very low variation from the mean.

Regarding with descriptive statistics of industry specific explanatory variables the following were observed.

Bank concentration which was measured by Herfindahl - Hirschman index (bank deposit to total banks deposit from the sample banks and square of the result). Descriptive result indicate that average industry concentration was 2.59%, meaning that the industrial concentration level of the Ethiopian banking sector during the analyzed period was low concentrated, the most concentrated bank in the sector has the maximum value of 15.44% share and the least concentrated bank in the sector has the minimum value of 0.00% percent share. The implications for minimum deposit concentration ratio which is around zero percent, it occurs due to the fact that the new entrant banks share was insignificant .The statistical result also shows 3.15% deviation of from the mean.

Another important variable for industry specific factors were reserve retirement. Reserve requirement was measured by required reserve balance maintained at central bank to total asset ratio. The descriptive data shows that mean value for the last fifteen years 14.22%.on the other hand the minimum and maximum reserve requirement was of .94% and 89.15% respectively. The statistical result also shows higher deviation of 10.94 % implies high variation from the mean.

Regarding the macroeconomic variable also shows that the mean real GDP growth in Ethiopia for the last fifteen years was 10.55%, with a maximum of 13.53% and a minimum of 7.4 %. Also the standard deviation was 1.59 % this implies that economic growth in Ethiopia during the period of 2002 to 2016 remains reasonable stable and the result was more or less in agreed with the government's report regarding economic growth.

Other macro-economic variable employed in this study was inflation; it had the mean CPI growth in Ethiopia for the last fifteen years was 14.72, with a maximum of 55.24% and a minimum of (1.22) %. Also the standard deviation was indicates somewhat a higher standard deviation 14.52% compared to GDP; this implies that inflation rate in Ethiopia during the study period remains somewhat unstable. That the most efficient bank has a quite substantial cost advantage compared to inefficient banks.

Furthermore interest rate on saving was one of the descriptive variables. The results shows on the above table indicate that average saving rate during the period depicted 4.07%.Maximum and minimum saving interest rate was shown 5 % and 3% respectively ,on the other hand standard deviation or variation from the mean indicates that .88% which is insignificant when we compare with inflation and GDP variance.

### 4.3. Correlation Analysis

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 (Brooks, 2008).The table below shows the correlation matrix among dependent and independent variables.

**Table 3- Correlation Matrix**

	<b>LR</b>	<b>BC</b>	<b>BS</b>	<b>CR</b>	<b>DR</b>	<b>GDP</b>	<b>INF</b>	<b>OC</b>	<b>RR</b>
<b>LR</b>	1								
<b>BC</b>	0.219832	1							
<b>BS</b>	0.696497	0.520231	1						
<b>CR</b>	-0.49736	-0.1331	-0.23529	1					
<b>DR</b>	0.819043	0.212108	0.700101	-0.51892	1				
<b>GDP</b>	-0.42598	-0.29261	-0.18355	0.284124	-0.25714	1			
<b>INF</b>	-0.00626	-0.19004	0.021275	0.057533	0.166473	0.410756	1		
<b>OC</b>	0.220211	-0.09054	-0.02567	-0.16085	0.175349	-0.32841	-0.05786	1	
<b>RR</b>	-0.15324	-0.29076	-0.2587	0.067664	-0.02942	0.281040	0.231754	-0.3403	1

Source: - Annual report of banks computed using E-views 8

As we have seen from the above correlation table 3, bank concentration, bank size, deposit rate, and operating cost have the most positively correlated variable with lending rate. This correlation clearly shows that, as those variables increases, lending rate also moves in to the same direction. On the other hand, credit risk, GDP, inflation and reserve requirement indicator seems to be negatively correlated with the lending rate. Which indicate that, when the aforementioned variables increase, lending rate moves in to the opposite direction.

As number of observation approaches to 100, the correlation coefficient of about or above 0.20 is significant at 5% level of significance (Meyerset al. 2006). The sample size of the study was 112 observations which was little bit approaches to 100 hence the study used the above justification for significance of the correlation coefficient. As per correlation result of the above table 3, deposit rate and bank size were positive and significant correlation with lending rate. On the other hand, credit risk was negative and significant correlation with lending rate.

#### **4.4. Tests for the Classical Linear Regression Model (CLRM) assumptions**

To maintain the data validity and robustness of the regressed result of the research, the basic classical linear regression model (CLRM) assumptions must be tested for identifying any misspecification and correcting them so as to augment the research quality (Brooks,2008). There are different CLRM assumptions that need to be satisfied and that are tested in this study, which are: errors equal zero mean test, heteroscedasticity, autocorrelation, normality, multicollinearity and model specification test depicted as follows (Brooks,2008).

##### **4.4.1. The errors have zero mean ( $E(u_t) = 0$ )**

This part shows the test for the assumptions of classical linear regression model (CLRM) namely the error have zero mean, heteroscedasticity, autocorrelation, normality and multicollinearity.

Relay on Brooks (2008), the first assumption required is that the average value of the errors is zero. In fact, if a constant term is included in the regression equation, this assumption will never be violated. Hence, study's regression model has included a constant term, so that this assumption was not violated (Brooks ,2008).

### 4.4.2. Heteroscedasticity Test

According to Brooks (2008) the variance of the errors must be constant (homoscedasticity). If the error terms do not have a constant variance, said to be Heteroscedasticity. Heteroscedasticity test is very important because if the model consists of heteroskedasticity problem, the OLS estimators are no longer BEST and error variances are incorrect, therefore the hypothesis testing, standard error and confident level will be invalid. The study used Autoregressive Conditional Heteroscedasticity (ARCH) to test the presence of heteroscedasticity.

**Table 4-Heteroskedasticity Test**

Heteroskedasticity Test: White Summary

F-statistic	2.017109	Prob. F(8,103)	0.0515
Obs*R-squared	15.17020	Prob. Chi-Square(8)	0.0559
Scaled explained SS	14.97663	Prob. Chi-Square(8)	0.0596

**Source: - Annual report of sample banks computed using EViews 8**

In this case, both the F- statistic and R-squared versions of the test statistic give the same conclusion that there is no evidence for the presence of heteroscedasticity, since the p-values are considerably in excess of 0.05 and also the third version of the test statistic, ‘Scaled explained SS’, which as the name suggests is based on a normalized version of the explained sum of squares from the auxiliary regression, suggests also that there is no evidence of heteroscedasticity. Thus, the conclusion of the test has shown that no evidence of heteroscedasticity and the null hypothesis is accepted.

### 4.4.3. Test of Autocorrelation

This assumption stated that the covariance between the error terms over time (or cross sectionals, for that type of data) is zero. In other words, it is assumed that the errors are uncorrelated with one another. If the errors are not uncorrelated with one another, it would be stated that they are auto correlate or that they are serially correlated” Brooks (2008). Brooks (2008) noted that the test for the existence of autocorrelation is made using the Durbin-Watson (DW) test and

Breusch-Godfrey test. The lagged value of a variable is used in this research in order to adjust the autocorrelation. Legged the value is simply the value that the variable took during a previous period Brooks(2008). So from the regression result DW is 1.99 it is closed to two.

**Table 5- Regression result Durbin-Watson**

R-squared	0.135448	Mean dependent var	-10.43487
Adjusted R-squared	0.068299	S.D. dependentvar	2.217144
S.E. of regression	2.140091	Akaike info criterion	4.436518
Sum squared resid	471.7389	Schwarz criterion	4.654969
Log likelihood	-239.445	Hannan-Quinn criter.	4.525151
F-statistic	2.017109	Durbin-Watsonstat	1.999316
Prob(F-statistic)	0.051493		

**Source: - annual report of sample bank computed using EViews 8**

Additional test for the existence of autocorrelation is thought Breusch-Godfrey test.

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

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.299227	Prob. F(1,102)	0.5856
Obs*R-squared	0.327601	Prob. Chi-Square(1)	0.5671

**Source. Annual report of sample banks computed using E-views 8**

The above table show test of autocorrelation after inclusion of lagged variable and p value is greater than 0.05and it indicates the absence of autocorrelation. The conclusion from both versions of the test in this case errors are uncorrelated.

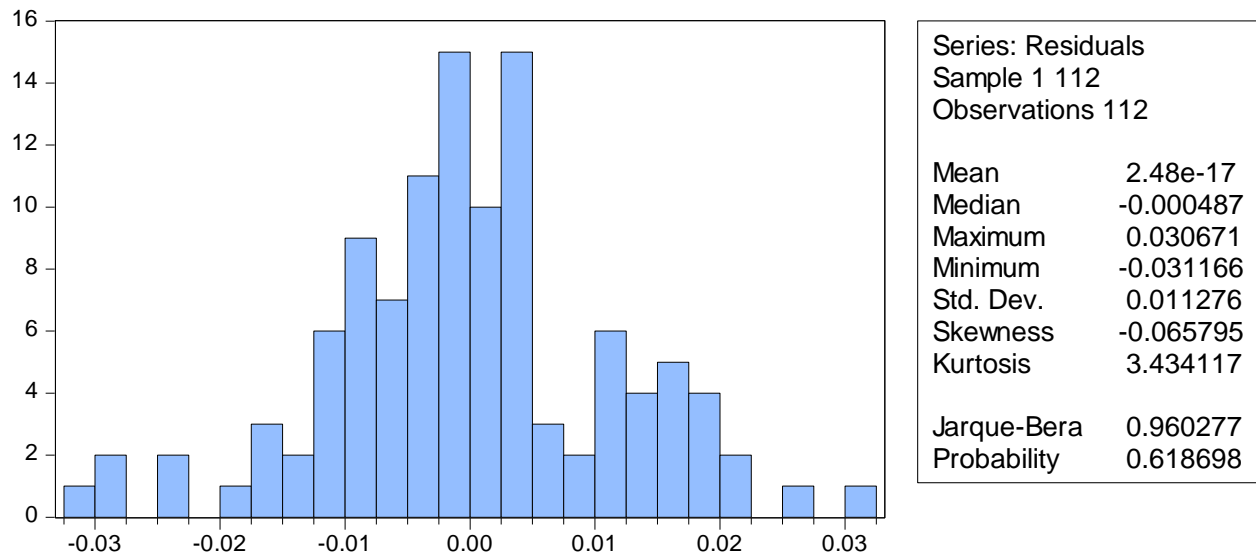
#### **4.4.4. Test of normality**

As stated by Brooks (2008), if the residuals are normally distributed, the histogram should be bell-shaped and the Bera-Jarque statistic would be significant. This means that Jarque Bera

formalizes this by testing the residuals for normality and testing whether the coefficient of skewness and kurtosis are  $\approx 0$  and  $\approx 3$  respectively. Normality assumption of the regression model can be tested with the Jarque- Bera measure. Skewness measures the extent to which a distribution is not symmetric about its mean value and kurtosis measures how it is fat the tails of the distribution. If the JarqueBera value is greater than 0.05, it's an indicator for the presence of normality (Brooks, 2008).

As shown in the histogram in the skewness and kurtosis approaches to zero (i.e. -0.065795) and Three (i.e. 3.434117) and the Jarque-Bera statistics (i.e. 0.960277) was not significant even at 10% level of significance as per the P-values shown in the histogram it was (0.618698). Hence, the null hypothesis that the error term is normally distributed should not be rejected.

**Figure 2. Test of normality**



**Source: - annual report of sample bank computed using EViews 8**

#### 4.4.5. Test of multicollinearity

An implicit assumption that is made when using the OLS estimation method is that the explanatory variables are not correlated with one another According to Brooks (2008) Multicollinearity occur when the independent variables are highly correlated with one another.

If the multicollinearity occurs, the regression model is unable to tell which independent variables

are influencing the dependent variable. To test the presence of multicollinearity problem the study used a correlation matrix

**Table 7. Correlation Matrix between independent variables**

	BC	BS	CR	DR	GDP	INF	OC	RR
BC	1							
BS	0.520231	1						
CR	-0.1331	-0.23529	1					
DR	0.212108	0.700101	-0.51892	1				
GDP	-0.29261	-0.18355	0.284124	-0.25714	1			
INF	-0.19004	0.021275	0.057533	0.166473	0.410756	1		
OC	-0.09054	-0.02567	-0.16085	0.175349	-0.32841	-0.05786	1	
RR	-0.29076	-0.2587	0.067664	-0.02942	0.281040	0.231754	-0.3403	1

**Source: - annual report of banks computed using E-views 8**

The method used in this study to test the existence of multicollinearity was by checking the Pearson correlation between the independent variables. The correlations between the independent variables are shown in the above table 7. All correlation results are below 0.8, which indicates that multicollinearity is not a problem for this study

#### **4.4.6. Model specification test**

According to Brooks (2008), further implicit assumption of the classical linear regression model is that the appropriate ‘functional form’ is linear. This means that the appropriate model is assumed to be linear in the parameters and that in the case, the relationship between dependent and independent can be represented by a straight line. Model specification error occurs when omitting a relevant independent variable and including unnecessary variable.

Therefore, in order to select a correct estimated model, the researcher had carry out the Ramsey-RESET Test to check on the model specification.



**Table 8 Result of model specification Test**

Ramsey RESET Test

Equation: EQ01

Specification: LR C BC BS CR DR GDP INF OC RR

Omitted Variables: Squares of fitted values

---

---

	Value	df	Probability
t-statistic	1.389231	102	0.1678
F-statistic	1.929961	(1, 102)	0.1678
Likelihood ratio	2.099374	1	0.1474

---

---

Source: - annual report of sample bank computed using EViews 8

From table 8, it can be concluded that this research model is correct, since the p value of f statistic is 0.16, which is greater than significance level of 0.05. Thus, it can be concluded that the model specification is correct.

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

This section presents the empirical findings from the econometric output on determinant of lending rate on Ethiopian commercial banks. Model Provided under Table 4.5 below reports regression results between the dependent variable of lending rate and explanatory variables.

**Empirical model:** As presented in the third chapter the empirical model used in the study in order to identify the determinant of lending rate in Ethiopian commercial banks provided as follows

$$\text{Lrate}_{it} = \alpha + \beta_1 \text{OC}_{it} + \beta_2 \text{CR}_t + \beta_3 \text{BS}_{it} + \beta_4 \text{HHI}_{it} + \beta_5 \text{RR}_{it} + \beta_6 \text{INF}_{it} + \beta_7 \text{GDP}_{it} + \beta_8 \text{IR}_t + \varepsilon_{it}$$

**Table 9 Regression Result**

Dependent Variable: LR  
 Method: Least Squares  
 Date: 05/18/18 Time: 10:53  
 Sample: 1 112  
 Included observations: 112

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.026207	0.015569	1.683277	0.0954
BC	-0.12555	0.045652	-2.750166	0.007*
BS	0.018639	0.003995	4.665372	0 **
CR	-0.138763	0.06684	-2.076052	0.0404*
DR	1.194127	0.241335	4.94801	0 **
GDP	-0.348501	0.089381	-3.899068	0.0002**
INF	-0.002837	0.00905	-0.313503	0.7545
OC	0.119218	0.152358	0.782487	0.4357**
RR	0.001947	0.01268	0.153534	0.8783
R-squared	0.776484	Mean dependent var	0.100853	
Adjusted R-squared	0.759123	S.D. dependent var	0.02385	
S.E. of regression	0.011705	Akaike info criterion	-5.980579	
Sum squared resid	0.014113	Schwarz criterion	-5.762128	
Log likelihood	343.9124	Hannan-Quinn criter.	-5.891946	
F-statistic	44.72705	Durbin-Watson stat	2.077772	

**Source: - annual report of sample bank computed using EViews 8**

**N.B:- \*\*and \* indicate that significant at 1% and 5% significance level respectively.**

## **4.5.1. Interpretation of R-squared, adjusted R-squared and F-statistic**

### **4.5.1.1. Interpretation of R-squared**

As we have seen from the above table, R-squared coefficient of 0.776484 obtained from the estimated model revealed that 77.65 percent of variation in lending rate is explained by the selected explanatory variables. Such as operating cost, Credit Risk, Bank size, Bank Concentration, Reserve Requirement, inflation rate, Gross domestic, and Deposit interest rate.

The R-square result makes sense because there are other factors were not included as a whole. The remaining factors can be account for the remaining 22.35 percent.

### **4.5.1.2. Interpretation of Adjusted R-squared**

The adjusted R-squared shows satisfactory levels, which mean that nearly 76% of the volatilities in the lending rate, are explained by the volatilities of independent variables included in the equation. Therefore, an adjusted R-square having value of 0.759123 shows that 76% percent of dependent variable is explained by the independent variables included in the model.

### **4.5.1.3. Interpretation of F-Statistics**

The F-statistics tests the fitness of the model and a recommended F-statistics should be greater than 5 for it to be considered. The regression F-statistic takes a value of 44.72 which is greater than 5 hence the model was fit for estimation.

## **4.6. Interpretation Results of the Regression Values**

The regression result in table 9 shows that, all bank-specific independent variables except reserve requirement had statistically significant impact on lending rate. On the other hand, the two industry specific variables reserve requirement and bank concentration had significant impact for the determination of lending rate. In line with the macroeconomic determinant factor of lending rate, GDP and interest rate significant, whereas inflation was insignificant.

Furthermore, table 9 also shows that there were inverse relationships between bank concentration, credit risk, GDP and inflation against lending rate as far as the coefficients for those variables are

negative. Thus the increase of those variables will lead to a decrease in lending rate, while the rest explanatory variables have a direct relationship with lending rate to the extent that their coefficients are positive. In general as per the regression results provided in table among the 8 independent variable used in this study 6 of them were significant.

#### **4.6.1. Bank-Specific factors of lending rate**

All the coefficients for the bank specific variables have the expected signs and highly significant at 1%, on the other hand credit risk significant at 5%.

##### **➤ Operating cost**

**H1:** There is significant positive relationship between operating cost and lending rate.

For operating cost, considering the regression model, the coefficient of the operating cost variable displays (as expected) a positive relationship with the bank's lending rate and it is statistically at 1% significant level. This result implies that the lending rate increases when the operating Expense increase, in order to cover the additional cost. Banks will not keep their overheads cost at low levels as a result the lending rate rise to compensate for the additional costs of operations and can be considered operationally inefficient. The expansion of retail banking products, increasing retail branch networks and rising staff costs as a result of a salary increase to bank workers as a result it contributed much to the rising costs of operations.

This result is consistent with the economic theory which deals about a positive relationship between the bank lending rate and overhead costs. Banks that incur high overhead costs are associated with increase in lending rate and higher costs indicate banking inefficiency. These results are consistent with other scholars who also found a positive relationship between the lending rate and bank operating costs (Yuga, 2006; Alidu, 2012; Adoah, 2015 and Ruth, 2014) noted that overhead costs are generally higher in developing poorer countries therefore they are of greater relevance in the Ethiopia since the country is still developing.

The statistically significant impact of operating expense on lending rate it is in line with hypothesis. In the Ethiopian commercial banks, the ratio of operating expenses (non-interest expense) to total assets has an estimated coefficient of 0.11923 in the lending rate regression,

which implies that a unit increase in operating expenses results in 0.11923 unit increases in the lending rate.

➤ **Bank size**

**H2:** There is significant positive relationship between Bank size and lending rate

In line with model specifications, bank size was measured by the natural logarithm of bank total assets. Asset growth of the banks shows a positive and significant at 1% significant level impact in its relationship with the banks' lending rate. This implies that bank size was able to explain the rising bank lending rate, as a result of independent variable of bank size positively correlated with dependent variable of lending rate. Estimation result suggests that larger banks in terms of total asset tend to have high margins. This implies that an increase in the market share on the total asset in the industry, lead to higher power to rise the lending rates. This finding this study is consistent with Adoah, (2015) and Maudos& Guevara,(2004) suggest a positive relationship between the size of a bank and lending rate.

The statistically significant impact of asset size on lending rate is in line with hypothesis. In the Ethiopian commercial banks, the bank size has an estimated coefficient of 0.018639 in the lending rate regression, which means that a unit change in asset growth generate 0.018639 increase in the lending rate.

➤ **Credit Risk**

**H3:** There is significant positive relationship between credit risk and lending rate

Credit risk measured by provision to loan, considering the regression model; the coefficient sign of the credit risk variable is negative in its relationship with the bank's lending rate and statistically significant at 5% significant level. The relationship of credit risk to the lending rates shows that an increase in the quantity of non-performing loans leads to a decrease of the lending interest rate. Ethiopian banks during this period have given more importance to loan market share increase, which is reflected in the balance sheet position. During this period, the banks have increased the variety of loan products that offer, but have shortened the processing time,

deriving from the increasing competition in loan market. And also NPLs shows a downward sloping in commercial banks in Ethiopia over the time of 2002-2013 (Anisa, 2015)

According to empirical results such as (Alidu, 2012; Adoah, 2015, Yuga, 2006; and Ruth, 2014) a positive correlation was expected. In some studies made in Argentina and Peru (Brock & Rojas-Suarez, 2000) it is concluded that the sign of the coefficient is negative, which means that the lending rate reacts negatively to a nonperforming loans' increase.

The statistically significant impact of credit risk on lending rate is in contrast with hypothesis. In Ethiopian Commercial Banks, the ratio of non-performing loan to total loan has an estimated coefficient of 0.138763 in the lending rate decision, which means that a unit increase in the non-performing loans brings about 0.138763 decreases in the lending rate. The major increment on NPL arise from long term loan portfolio, due to such fact the banks change their loan portfolios as per central bank regulation from long term to short term loan to eliminate the short term increment shown on NPL. After doing so in order to attract short term borrower the banks reduce lending rate.

#### **4.6.2. Industry specific factors of lending rate**

The identified industry specific factors such as the bank concentration, reserve requirement and deposit interest rate as the factors those are relevant in explaining bank lending rate.

##### **➤ Bank concentration**

**H4:** There is significant positive relationship between bank concentration and lending rate.

Bank concentration measured by bank deposit to total sample bank deposit the hole square. The result shows that bank concentration has negative and statistically significant at 1% significance level (p-value = 0.0007) The coefficient of concentration implies that the level of concentration increased by 1% lead lending rate to decrease by 12.55%. Which implies that bank concentration is an indicator of banks market share, when market share increase the lending capacity also moves in the same direction. To doing so when the economic condition is not vibrant within a given countries borrower might be reduce to attract customer for borrowing bank reduce their lending interest rate.

➤ **Reserve requirement**

**H5:** There is significant positive relationship between reserve requirement and lending rate.

As expected the coefficient of reserve requirement which was measured by the deposit reserve requirement central bank to total asset ratio it was positive and statistically insignificant level (p-value= 0.8783). The coefficient of reserve requirement implies that if the reserve requirement increased by 1% lending rate insignificantly increase by 0.19%. This implies that the reserve requirement maintained at central bank is not a loan able fund to the customer, as a result the effect of reserve on lending rate was negligible (insignificant) ,however there was positive correlation between variables .This finding is consistent with (Zulfiqaret al., 2016 &Adoah,2015)

➤ **Interest rate**

**H6:** There is significant positive relationship between is deposit interest rate and lending rate.

Interest rate measured by nominal deposit interest rate set by central banks Hypothesis shows that there is positive relationship between interest rate and lending rate, as expected the coefficient of interest rate which is measured by standard deviation of annual central bank interest rate, it was positive and statistically significant relation at 1% significance level (p-value=0.0000). The coefficient of interest rate implies that if interest rate increased by 1 lending rate change by 1.19. There is a positive relationship between interest rate and lending rate. Change in deposit interest rate creates reinvestment and refinancing risks arising from fluctuations in interest rates, due to the maturity mismatch between banks assets and liabilities accordingly, bank lending rate are used as a risk hedging mechanism so, banks are inclined to charge higher lending. This finding is consistent with Yuga, (2006) and Ruth, (2014).

### **4.6.3. Macroeconomic-Specific factors of lending rate**

The level of stability in an economy has a bearing on the way banks higher lending rate. Generally, low lending rates have been associated with countries that have economic stability. The macro economy factor includes inflation rate and the gross domestic product growth in the economy.

➤ **Inflation**

**H7:** There is significant positive relationship between is inflation and lending rate.

Inflation measured by annual CPI. This variable has a negative relationship with the dependent variable of lending rate which implies that an increase in the variable will not result in an increase in the lending rate vice visa. This indicate that a unit increase in inflation rate will result in a (0.002837) decrease in the lending rate. And its insignificance with the p value of 0.7545. This means that in Ethiopian commercial bank do not base their lending rate on inflation. The countries with high inflation rate lead to unproductive banking sectors and equity markets. This adverse suggests that inflation reduces banks' lending to the private sector. As a result when inflation increase lending rates becomes decline (Maudos& Guevara, 2004).

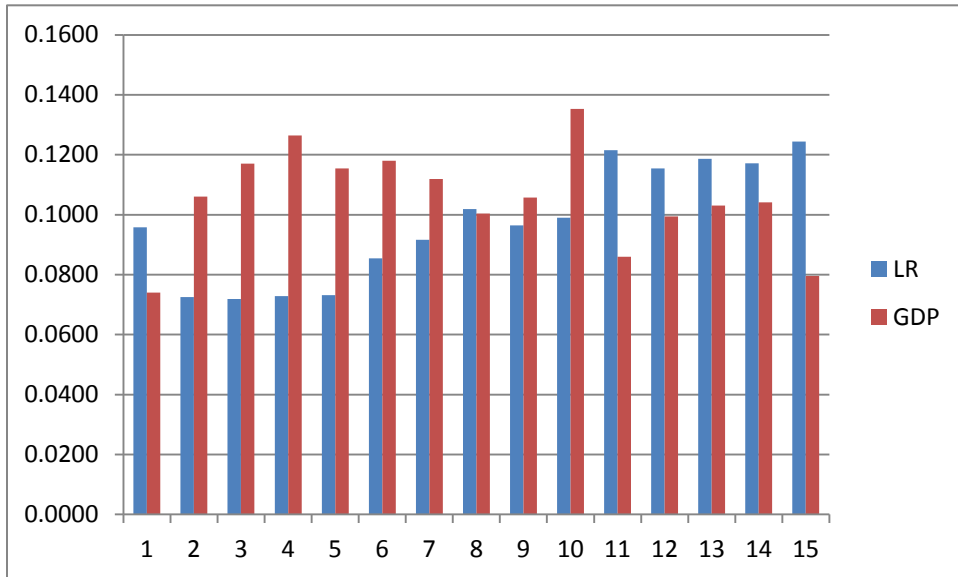
➤ **GDP Growth**

**H8:** There is significant positive relationship between is GDP and lending rate.

GDP measured by annual GDP rate. This variable has a negative relationship with the dependent variable which implies that an increase in the variable will not result in an increase in the lending rate vice visa. This implies that a unit increase in GDP will result in a (0.348501) decrease in the lending rate. And its significance with the p value of 0.0002. This means that in Ethiopian commercial bank do not base their lending rate on GDP. It can be seen from the following Table 10. GDP increase from 1 to 2 but banks' lending rate decrease from 10 to 6. This result is inconsistent with the findings of Ruth (2014), who state that lending rates have a positive relationship with GDP. Her views indicate that when country economic condition (GDP) is flourishing, many investors will be willing to invest in that particular country and this will result in increased the demand for credit, where lenders will take advantage by asking for higher rate. The actual result shows that there was negative correlation between bank lending rate and GDP. This empirical result is consistent with Adoah, (2015)



**Figure -3 Relations between lending rate and GDP in Ethiopia**



**Source from row data used for econometrics**

## CHAPTER FIVE

### CONCLUSIONS AND RECOMMENDATIONS

In previous chapter presented descriptive and regression analysis to examined the determinant of lending rate in commercial banks of Ethiopia. This chapter discussed the conclusions and recommendations of the study. The chapter organized in to four sections, the first section 5.1 presents summery of the findings, 5.2 presents the conclusions of the study, section 5.3 presents the recommendations provide depend on the findings of the study and 5.4give recommendation for further research.

#### **5.1. Summary of the findings**

The broad objective of the study was to investigate bank specific, industry specific and macroeconomic determinants of lending rate in Ethiopian commercial banks. To achieve the broad objective of the study used quantitative research approach. The study applied descriptive statistics and multiple linear regression analysis to analyzed and identify the influences of bank specific, industry and macroeconomicfactor on lending rate of eight sampled Ethiopia commercial banks. A sample of 112 observations has been analyzed over the period from 2002-2016 and used unbalance panel data. Regression analysis and descriptive statistics were employed on secondary data collected from NBE, MoFED and sample banks financial statement. Multiple linear regressions model was conducted by the ordinary listing square and CLRM assumptions test of the models no evidence for the presence of normality, heteroscedasticity, multicollinearity and autocorrelation problem. The study shows the cause-effect relationship between the bank specific, industry specific, macroeconomic factor and lending rate of Ethiopian commercial banks. Thestudy uses three bank specific variables, two industry specific variable and three macroeconomic factors such as operating cost, Credit Risk, Bank size, Bank Concentration, Reserve Requirement, inflation rate, Gross domestic, and Deposit interest rate

## 5.2. Conclusion

The empirical study on the determinants of lending rate in Ethiopia arrived in the following conclusions.

Regarding with bank specific factors such as credit risk, operating cost and bank size, the following conclusions were drawn:

First, as it was expected that a positive and statistically significant relationship between credit risk and bank lending rate, but it was statistically significant and negative correlation with lending rate. The relationship between credit risk and lending rate suggests that an increase in provision for loan losses implies a higher cost of bad debt write offs.

Second, the correlation coefficient of operating cost has positive and statistically significant relation with lending rate. The positive relationship between operating cost and banks' lending rate shows that, banks operating with high costs due to diseconomies of scale. As a result the bank operate with high lending rate to cover those costs and maintain overall profitability as per the planned.

Third, as it was expected the result shown as there is significant and positive correlation between bank size and lending rate. Which implies that when the size of bank becoming high when we compare from the other banks, it indicate that the total assets volumes becomes high as a result of this, from the total asset element loan able fund might be one element, due to such fact the bank easily influence on the lending rate because the capacity is greater on the market.

Regarding with industry specific factors such as bank concentration, reserve requirement and deposit rate, the following conclusions were drawn:

First, the correlation coefficient of bank concentration was negative and it is statistically significant at 5%. This implies that an increase in the market share on the total asset in the industry, lead to higher power to rise the lending rates

Second, the correlation between reserve retirement and lending rate was insignificant and positive correlations. Which implies that the reserve requirement maintained at central bank is not a loan able fund to the customer, as a result the effect of reserve on lending rate was negligible (insignificant), however there was positive correlation with lending rate.

Third, the correlation coefficient of deposit interest rate is positive and statistically significant. This suggests that the change in deposit interest rate lead to increase interest expense, as a result

in order to compensate and sustain the profitability of the organization bank lending rate rise more than increments made on deposit rate.

In line with macroeconomic variables, such as GDP and inflation the study drawn the following conclusion.

First, the correlation coefficient of GDP is negative and significant, which implies that when GDP rise lending rates reduce. This means that in Ethiopia, commercial banks do not base their lending rate on GDP.

Second, the correlation coefficient inflation is negative and insignificant, which implies that when inflation rise lending rates reduce.

The result of this finding is summarized in the following table.

**Table -10 Summary of actual and expected signs of explanatory variables on the dependent variables**

<b>Classification</b>	<b>Variables</b>	<b>Expect sign &amp; level of significant</b>	<b>Actual sign &amp; level of significant</b>
Bank Factor	operating cost (OC)	Positive & significant	Positive & significant
	Credit Risk(CR)	Positive & significant	Negative & significant
	Bank size	Positive & significant	Positive & significant
Industry specific variables	Bank Concentration (HHI)	Positive & insignificant	Negative & significant
	Reserve Requirement(RR)	Positive & significant	Positive & insignificant
	Annual saving interest rate	Positive & significant	Positive & significant
Macroeconomic variables	Annual Real GDP growth rate (RGDP)	Positive & significant	Negative & significant

**Source:-Analysis result**

### 5.3. Recommendations

The analysis result shows that Reserve requirement has positive and significant impact on lending rate. Reserve requirement regulation which forced banks to preserve about 5% of the total deposit which earns no interest is currently affecting the Ethiopian commercial banks' lending rate positively. So the central bank needs to revisit its policy or it should take some corrective actions like paying at least equivalent interest with that of the deposit rate paid for commercial bank's customers.

The results confirmed that operating cost has positive impact on banks' lending rate. To minimize the levels influence commercial banks required to improving on their operational efficiency which is relevant to reduce operational cost to set reasonable lending rate. Improving operational efficiency made by reducing operating expense using appropriate cost reduction strategies and improvement in asset quality will help to bring bank lending rate down, as a result it attract investors on the same time employment opportunity will also increase, furthermore the chronic trade deficit problem also reduce. This can be done by improving technology base service (capital incentive) other than labor base works.

Saving interest rate revealed that significant and positive relation with lending rate. As a result the banks required to improve deposit rate base lending rate because the empirical result shows that a unit change in saving interest rate results more than a unit increment on lending rate. As a result banks required to diversifies there income portfolio from difference source other than depending only on interest rate .It gives an opportunity to set reasonable lending rate which is important for the country expansion policy

Bank size has significant and positive correlation with lending rate. The study established that banks that possess a greater size charges high lending rate. In Ethiopia the commercial banking sector has relatively a fewer players and the industry still lacks comparability on size. Hence, there is need for the banks to increase their size interims of total asset to eliminate monopolistic lending rate competition to encouraging investments in the countries.

In general, the findings of the study lead to an overall recommendation that all commercial banks should have to consider the effect of operating cost, Credit Risk, Bank size, Bank Concentration, Gross domestic, and Deposit interest rate in order to set reasonable lending rate which can be support their performance and the country's economic development

#### **5.4. Recommendation for future research**

The major focus of this research was to identify the determinants of lending rate of commercial bank in Ethiopia using specific variables. As we have seen from the regression results the value of  $R^2$  which was about 77.35% the result indicate that empirical study addressed 77.35% of independent variable effect on dependent variables .However, there are so many bank specific, industries specific and macroeconomic variables that were not included in this study. As a result future researchers are recommended to undertake similar study by considering additional variables .The researches are useful to validate findings of the current study.

On the other hand future research should also be carried out on the impact of high lending rate on the profitability of Ethiopian commercial bank.

Furthermore, future research should undertake the same study by considering the newly emerging factors affecting lending rate in Ethiopia commercial banks.

## Reference

- Aboagye, A. Q., Akoena, S. K., & Gockel, A. F. (2008). Explaining Interest Rate Spread in Ghana. *African Development Review* , 378-399.
- Abor, S. M. (2014). Sgency Conflict and Bank Interest Spreads in Ghana. *African development Review*, 26(4) , 549-560.
- Adoah, I. (2015). Determinants of universal bank lending rate in Ghana. *unpublished Master's Thesis University of Ghana* .
- Afzal,A.(2011). Interest rate spreads, loan diversification and market discipline in Pakistan's Commercial banking sector', PhD thesis, University of Pakistan.
- Agu, C. C. (1992). Analysis of the Determinants of Nigerian Banking Systems profits and profitability performance. *Policy Research working paper2408.Washington.DC:World Bank* .
- Ahokpossi, C. (2011). Interest rate spreads,loan diversification and market discipline in pakistan's Commercial banking sector. *PhD thesis,University of pakistan* .
- Alidu, U. (2012). The determinants of lending rate in Ghana. *Unpublished Mater's Thesis Ghana Kwame Nkrumah University* .
- Allen, L. (1988). The Determinants of Bank Interest Margin. *Jornal of Financial and Quantitative analysis* .
- Amidu, M., & Wolfe, S. (2012). The impact of market power and funding strategy on bank-interest margins. *The European Journal of Finance*, 19 (9), 888-908.
- Amoako, I. S. (2014). Macroeconomic Determinants of interest rate spread in Ghana. *Jornal of Finance and Bank Management* 2(2) , 115-132.
- Angbazo, L. (1997). Commercial bank net interest margins,default risk,interest rate risk and off-balance sheet banking. *Jornal of Banking and Finance* , 55-87.
- Anisa, U. (2015). Determinant of non-performing loan in Ethiopia. *Unpublished Master's Thesis AAU* .
- Anyanwu, J. C. (1999). Monetary Economics Theory policy and Institution Hybrid publishers. 247-274.
- Aregu, A. (2014). Determinants of interest spread in Ethiopia . *Unpublished Master's Thesis* .
- Barajas, A., & Salazar, R. s. (1999). Interest spreads in banking in Colombia. *IMF Staff paper* , 196-224.
- Bashir, H. M. (2003). Determinants of profitability in Islamic banks. *Dome evidence from the Middle East.Islamic economic studies* , 31-57.
- Bawumia, M., Belnye,F & Ofori, M. E. (2005). The determinanat of bank interest spreads in Ghana. *An empirical analysis of panel data.Working paper series* .
- Boyd, J. H. & B. Champ, (2006) "Inflation, Banking and Eco-nomic Growth," Economic Commentary, Ohio, USA: Federal Bank of Cleveland.

- Bekaert, G. (1998). Regime Switches in Interest Rates. *Cambridge, Mass: National Bureau of Economic Research* .
- Belay, G. (2015). Determinants of cost of financial intermediation in Commercial banks of Ethiopia. *Unpublished Master's Thesis* .
- Berger, A. & Hannah .N. (1989) The Price Concentration Relationship in Banking Rev. Econ. Stat.71, 291-299
- Branko, K. (2014). Determinants of lending interest rates granted to companies in Croatia. *Jornal of accounting and Management* .
- Brock, P. and Suarez, R L. (2000) Understanding the Behavior of Bank Spreads in Latin America, *Journal of Development Economics*, 71(2), pp. 291-299
- Brooks, C. (2008). *Introductory Econometrics for Finance 2nd edition*. Cambridge: New York publisher.
- Buchs, T. D., Mathisn & IMF, J. M. (2005). Competition and efficiency in banking: Behavioral evidence from Ghana. Washington, D.C: International Monetary Fund.
- Buda, J. H. & B.Champ (2006). Inflation Banking and Economic Growth. *Economic Commentary, Ohio, USA: Federal Bank of Cleveland* .
- Caplan, B. (2000). Rational expectation. George Mason university: Departement of economics.
- Chodechai, S. (2004). Determinants of Bank Lending in Thailand: An empirical Examination for the years 1992 to 1996. *Development, Economics and policy Vol.33* .
- Creswell, Jw. (2013). Research Design ; qualitative, quantitative and mixed methods approaches, 4<sup>th</sup> ed United Stae of America
- Das, A., & Ghosh, S. (2007). Determinants of credit risk in Indian state-owned banks: An empirical Investigation. *ECONOMIC ISSUES-STOKE ON TRENT-*, 12(2), 27
- De Young, R., Gron, A., & Winton, A. G. (2005). Risk overhang and portfolio decisions in Nigeria.
- Demirgüç-Kunt, A., & Huizinga, H. (1999). Determinants of commercial bank interest margins and Profitability: some international evidence. *The World Bank Economic Review*, 13 (2).
- Dorothy, N. (2013). Interest Rate spreads in Uganda's banking Sector. *International Journal of Economics and Finance; Vol.5, No 1; 2013*.
- Ewert et al. (2000). Anarger of credit Market theory , a larger perspective, 1st ed. 13-21.
- Fahad, N. (2015). Analysis of some inner factors affecting the lending rate and commercial bank behavior. *Emperical study based on the commercial Banking sector of Pakistan, Vol.12/nr 4*.
- Folawewo O. A., & Tennant, D. (2008), Determinants of interest spreads in Sub- Sub-Sarahan



- African countries: a dynamic panel analysis. Unpublished thesis.
- Francisco, R. (2015). Microeconomic determinants of bank lending :an application to the Spanish Case Universidad de Granada.
- Franken, A. A. (2010). Bank credit during the 2008 financial crisis. *Across-country comparison. IMF working paper* , 1-25.
- Frederiken, R. E. (1997). Government Investment and Follow -on private Sector Investment in Pakistan. *Journal of Economic Development*,22 (1),91-100 .
- Fridah, G. (2011). determinants of lending rate of commercial banking in Kenya. *Unpublished Master's Thesis University of Nairobi* , 13-15.
- Fridah ,G.(2011) .Determinants of lending rate of commercial banks in Kenya, Unpublished Master's Thesis University of Nairobi,pp, 13-15
- Gambacorta, L. (2004). *How do banks set interest rate*. Akra: universal publisher.
- Ghosh, A. D. (2007). Determinants of credit risk in Indian state-owned banks:An empirical Investigation. *Economic issues-stoke on trent* 12(2),27 .
- Gilbert, M. S. (2014). Macroeconomic Determinants of Interest rate spread in Ghana. *Jornal of Finance and Bank Management* .Vol.2, No 2 , 115- 132.
- Grenade, H. K. (2007). Determinants of Commercial Banks Interest Spreads. *Jornal of Empirical Evidence from Eastern Carbean Currency Union* .
- Guevara, J. M. (2004). Factors Explaining the interest Margin In the Banking. *Jornal of Banking and Finance*,28(9) , 2259-2281.
- Hannah, A. B. (1989). The price Concentration Relationship in Banking . *Rev.Econ stat* , 291-299.
- Hesse, T. B. (2006). Bank efficiency ,ownership and market structure Why are interest spreads so high in Uganda? *World Bank policy Research Working paper* .
- Huizinga, A. D.-k. (1999). Determinants of commercial bank interest margin and profitability:some international evidence. *The World Bank Economic Review* 13(2) .
- Khan, H. & Khan B, (2010). What drives Interest Rate of Commercial Bank in pakistan?Emperical Evidence based on panel Data. *SBP Research Bulletin Volum 6,Number 2,2010*.
- Karim, Z., & Abdul-Karim, N. w.-S. (2011). Bank lending channel of moetary policy:Daynamic panel sata study of Malaysia. *Journal of Asia-Pacific Business*,12(3) .
- Klein, M. (1971). A theory of the Banking Firm. *Jornal of money,credit and Banking*,3(2) , 205-218.
- Kothari, C. R. (2004). *Research methodology*. NewDelhi: New Age International publisher.
- Kuttner, B. M. (1991). *Why does the paper-bill spread pridict real economic activity*. Cambridge : National Bureau of Economic Research.

- Lindgren, C. J., Garica, G. G., & Saal, M. I. (1996). *Bank soundness and Macroeconomic policy*. International Monetary Fund.
- Ljupka, G. (2010). Determinants of lending interest rates granted to companies in Croatia.
- Mansor H. Ibrahim. (2006). Stock prices and bank loan dynamics in developing country: The case of Malaysia. *Journal of Applied Economics* , 71-89.
- Mensah, E. (2005). Indicators for Computing interest Rates. *Journal of Bankers Association* .
- Meshesha, D. (2016). Determinants of net interest margin in Ethiopia . *Unpublished Master's Thesis* .
- Mishkin, F. S. (2004). Can Inflation Targeting Work In Emerging Market Countries? *NBER* .
- Mlachila, e. w. (n.d.). Financial reforms and interest rate spread in Commercial banking system in Malawi. *IMF Staff papers* , 96-122.
- Mohamed, A. (2016). Determinants of bank lending : case of Tunisia . *International Journal of Finance and Accounting 2016*, 5 (1) , 27-36.
- Monti, M. (1972). *Deposit, Credit and interest rate determination under alternative bank objective*. Amsterdam : Holland Publisher.
- Moses, O. (2014). The determinant of bank interest spreads in Ghana. *international journal of economic behavior and organization 2(4)* , 49-57.
- Ngugi, R. (2001). An empirical analysis of interest rate spread in Kenya Nairobi. *african economic Research Consortium* , 106.
- Olusanya, S. O., & Ohadebere, a. O. (2012). Determinants of lending behaviour of commercial banks in: Evidence from Nigeria , a co-integration analysis (1975-2010). *Journal of Humanities and Social science 5(5)* , 71-80.
- Pandey, I. M. (1999). *Financial Management*. Vikas Publishing House Pvt.Ltd.
- Ramful, P. (2001). *the Determinants of interest Rate spread: Empirical evidence on Mauritan Banking Sector*. Research Departement of Mauritius .
- Rodriguez, S. C. (2005). Pricing Strategies in European Banking: Specialization.
- Ruth, Z. (2014). Determinants of loan pricing of commercial banks in Kenya. *unpublished Master's Thesis* , 15-16.
- Sarpong, D., Winful, E. C., & Nitiamoah, J. (2011). Determinants of wide interest margin in Ghana panel EGLS analysis. *Journal of SSEN* .
- Thomas, S. Y., Ho, T., & Saunders, A. (1981). The Determinants of Bank Interest Margins theory and Empirical Evidence. *Journal of Financial and Quantitative analysis, 16* , 581-600.
- Sharpe, R. w. (1985). A time Series /Cross Section analysis of Determinants of Australian Trading Bank Loan /deposit Margins: 1962-1981. *Journal Of Banking and Finance, 9* , 115-136.

- Solis, J. M. (2009). The determinants of net interest income In Mexician bankin system. *jornal of Bank and Finance* .
- Stein, j. C. (2000). *Information production and capital allocation :Decentralized Vs. hierarchical firms.* National Bureau of Economic Research.
- Suarez, P. B. (2000). understanding the Behavior of Bank Spreads In Latin America. *Jornal of Development Economics 71(2)* , 291-299.
- Talavera, O., & Zhould, A. T. (2006). Macroeconomic uncertainty and bank lending:the case of Ukraine. *Jornal of Econoimic 36(2)* , 279-293.
- Tennant, O. A. (2008). Determinant of Interest spreadd in Sub -Saharan African countries. *A daynamic panel analysis* .
- Thomas, S. &. (n.d.). The Determinants of Banks interest Margins:theory and Emperical Evidence.e. *Jornal Of Finance* .
- Thomas, S. H. (1981). The Determinants of Bank Interest Margins:theory and Empirical Evidence. *Jornal of Finance Wuality.Anal 16(04)* , 581-600.
- Uchida, H., & Watanabe, G. F. (2008). Bank size and lending relationships in Japan. *jornal of Japanese and international economics,22 (2)* , 242-267.
- Udell, A. N. (2006). A more complete conceptual framework for SMe finance. *Jornal of Banking & Finance,30(11)* , 2945-2966.
- VandenHeuvel, S. (2000). The banker capital channel of monetary policy. *Working paper.New Haven ,Conn: Yale University* .
- Wambua, M. w. (2013). assessing the determinants of interest rate spreads of Commercial banks in Keniya. *KBA centre for research on financial market and policy working paper Series* .
- Wolfe, M. A. (2012). The impact of market power and funding strategy on bank - intere margins. *The European Jornal of Finance,19(9)* , 888 908.
- Wong, K. P. (1997). Determinants of bank interest marging under credit and interest rate risks. *Jornal of Bnaking & finance, 21 (2)* , 251-271.
- Wooldridge, JM. (2004). *Introductory Econometric International student edition.* Canada :Thomson South-West.
- YU, M. &. (1995). Interest Rate Risk and Duration Structure of banks in Taywan. *Jornal of management Science,12* , , 169-193.
- Yuga, R. (2015). Determinants of lending Interest Rate of nepales Commercial Banks. *Economy Jornal of Development Issues Vol. 19 & 20 No.1-2 (2015)* .
- Zarruk, E. R. (1989). Bank spread with Uncertain deposit Level and Risk aversion. *Jornal of Bnaking and Finance (13)* , 797-810.

Zulfiqar, A., Zahid, B., Muhammed, U., Sman, A., Ahemed, G., & Bain, A. M. (1951). Relation of profit rate to industry concentration:american Manufacturing 1936-1940. *Quarter jornal of Economics* , 293-324.

# APPENDIXES

## Appendix 1- Descriptive Analysis

	LR	BC	BS	CR	DR	GDP	INF	OC	RR
Mean	0.100853	0.025947	3.571988	0.029838	0.040714	0.105547	0.147215	0.031643	0.142254
Median	0.099705	0.012566	3.622917	0.026116	0.040000	0.105671	0.104464	0.030515	0.108958
Maximum	0.151897	0.154369	4.471433	0.098273	0.050000	0.135341	0.552413	0.076023	0.891473
Minimum	0.039370	0.000000	2.110590	0.000000	0.030000	0.074000	-0.012219	0.010620	0.009363
Std. Dev.	0.023850	0.031465	0.517418	0.020638	0.008875	0.015933	0.145179	0.008781	0.107412
Skewness	-0.018313	1.919795	-0.428895	0.729178	-0.139498	-0.185448	1.695718	1.409827	3.317215
Kurtosis	2.485204	6.470073	2.550787	3.573646	1.295271	2.648305	5.059229	7.952944	22.34663
Jarque-Bera	1.242997	124.9913	4.375442	11.46074	13.92505	1.219178	73.46390	151.5832	1952.103
Probability	0.537139	0.000000	0.112172	0.003246	0.000947	0.543574	0.000000	0.000000	0.000000
Sum	11.29548	2.906027	400.0626	3.341830	4.560000	11.82131	16.48812	3.544047	15.93248
Sum Sq. Dev.	0.063140	0.109898	29.71708	0.047277	0.008743	0.028177	2.339543	0.008558	1.280639
Observations	112	112	112	112	112	112	112	112	112

## Appendix 2- Correlation Analysis

	LR	BC	BS	CR	DR	GDP	INF	OC	RR
LR	1.000000	0.219832	0.696497	-0.49736	0.819043	-0.42598	-0.00626	0.220211	-0.15324
BC	0.219832	1.000000	0.520231	-0.1331	0.212108	-0.29261	-0.19004	-0.09054	-0.29076
BS	0.696497	0.520231	1.000000	-0.23529	0.700101	-0.18355	0.021275	-0.02567	-0.2587
CR	-0.49736	-0.1331	-0.23529	1.000000	-0.51892	0.284124	0.057533	-0.16085	0.067664
DR	0.819043	0.212108	0.700101	-0.51892	1.000000	-0.25714	0.166473	0.175349	-0.02942
GDP	-0.42598	-0.29261	-0.18355	0.284124	-0.25714	1.000000	0.410756	-0.32841	0.281040
INF	-0.00626	-0.19004	0.021275	0.057533	0.166473	0.410756	1.000000	-0.05786	0.231754
OC	0.220211	-0.09054	-0.02567	-0.16085	0.175349	-0.32841	-0.05786	1.000000	-0.3403
RR	-0.15324	-0.29076	-0.2587	0.067664	-0.02942	0.281040	0.231754	-0.3403	1.000000

### Appendix 3- Test of Heteroskedasticity

Heteroskedasticity Test: Harvey

---



---

F-statistic	2.017109	Prob. F(8,103)	0.0515
Obs*R-squared	15.1702	Prob. Chi-Square(8)	0.0559
Scaled explained SS	14.97663	Prob. Chi-Square(8)	0.0596

---



---

Test Equation:

Dependent Variable: LRESID2

Method: Least Squares

Date: 05/18/18 Time: 10:50

Sample: 1 112

Included observations: 112

---



---

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-7.334114	2.846517	-2.576522	0.0114
BC	-7.006964	8.346474	-0.839512	0.4031
BS	-1.433084	0.730414	-1.962015	0.0525
CR	-6.739664	12.22025	-0.551516	0.5825
DR	52.09014	44.12289	1.18057	0.2405
GDP	3.262159	16.34131	0.199627	0.8422
INF	-1.245565	1.654541	-0.752816	0.4533
OC	-7.413871	27.85543	-0.266155	0.7907
RR	2.488126	2.318347	1.073233	0.2857

---



---

R-squared	0.135448	Mean dependent var	-	10.43487
Adjusted R-squared	0.068299	S.D. dependent var		2.217144
S.E. of regression	2.140091	Akaike info criterion		4.436518
Sum squared resid	471.7389	Schwarz criterion		4.654969
Log likelihood	-239.445	Hannan-Quinn criter.		4.525151
F-statistic	2.017109	Durbin-Watson stat		1.999316
Prob(F-statistic)	0.051493			

---



---

## Appendix 4- Regression result

### Regression result

Dependent Variable: LR

Method: Least Squares

Date: 05/18/18 Time: 10:53

Sample: 1 112

Included observations: 112

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.026207	0.015569	1.683277	0.0954
BC	-0.12555	0.045652	-2.750166	0.007
BS	0.018639	0.003995	4.665372	0
CR	-0.138763	0.06684	-2.076052	0.0404
DR	1.194127	0.241335	4.94801	0
GDP	-0.348501	0.089381	-3.899068	0.0002
INF	-0.002837	0.00905	-0.313503	0.7545
OC	0.119218	0.152358	0.782487	0.4357
RR	0.001947	0.01268	0.153534	0.8783
R-squared	0.776484	Mean dependent var		0.100853
Adjusted R-squared	0.759123	S.D. dependent var		0.02385
S.E. of regression	0.011705	Akaike info criterion		-5.980579
Sum squared resid	0.014113	Schwarz criterion		-5.762128
Log likelihood	343.9124	Hannan-Quinn criter.		-5.891946
F-statistic	44.72705	Durbin-Watson stat		2.077772
Prob(F-statistic)	0			



