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DETERMINANTS OF LENDING INTEREST RATE:

/EMPERICAL STUDYON PRIVATE COMMERCIALBANKS IN ETHIOPIA/

BY:

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**A THESIS SUBMITTED TO THE DEPARTMENT OF ACCOUNTING AND FINANCE
FOR THE PARTIAL FULFILLMENT OF THE REQUIRMENT OF
MASTER’SDEGREE IN ACCOUNTING AND FINANCE**

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JUNE 2024

ADDIS ABABA, ETHIOPIA



DECLARATION

I, AbatnehTibebu declare that this thesis is my original work, prepared under the guidance of Dr, AbebawKassie. I prepared, collected, analyzed and finished this thesis in accordance with all the scholarly ethical standards. All academic information used in this thesis has been acknowledged through citations. Additionally, I affirm that I have followed all rules governing academic honesty and integrity and that I have not created or manipulated any ideas or data in my work. This thesis is being submitted in partial fulfilment of Addis Ababa University's Master of accounting and finance requirement. I further confirm that this thesis has not been submitted either in part or in full to any other higher learning institution for the purpose of earning any degree.

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Statement of Certification

This is to certify that this study, “determinants of lending interest rates; the cause study on selected private commercial Banks in Ethiopia”, undertaken by AbatnehTibebuMeharie for the partial fulfillment of Masters of accounting and finance at Addis Ababa University, is an original work and not submitted earlier for any degree either at this University or any other University, and has been supervised in accordance with university policies, and the student has my permission to submit it for evaluation.

Research Advisor: Dr.AbebawKassie.

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DateJune, 2024



Determinants of lending interest rates on private commercial Banks in Ethiopia

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Approval Sheet

As members of the Board of Examining for the Final master of accounting and finance thesis Defiance, we certify that we have read and assessed the study prepared by AbatnehTibebuMeharie entitled “determinants of lending interest rates on selected private commercial Banks in Ethiopia”, and we recommend that the thesis be accepted as satisfying the requirement for the Degree of Master of Art in Accounting and Finance.

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Acknowledgement

First of all, I would like to thank the Almighty God for letting everything to happen in better way. Then I would like to give our honorable thanks to the department as a whole for giving the opportunity to prepare this thesis.

I would like to recognize the invaluable assistance of my advisor Dr. AbebawKassie for his unlimited support and motivation beside his friendly and professional approach and advice.

Finally, my Special note of appreciation also extended to all my beloved friends for their constructive comments, love, prayer, moral and encouragement for the finalization of this paper.

Acronym

AB: Awash Bank S.C.

BOA: Bank of Abyssinia S.C.

BS: Bank size

CBO: cooperative bank of oromia

CLRM: Classical Linear Regression Model

DB: Dashen Bank S.C.

DR: Deposit Rate

ER: Exchange Rate

FEM: Fixed Effect Model

GFC: Global Financial Crisis

HB: Hibret Bank S.C.

LIQ: Liquidity

IR: Inflation Rate

LIR; Lending Interest rate

LIB: Lion international Bank S.C.

OIB: Oromia International Bank S.C.

OC: Operational Cost

OLS: Ordinary Least Square

NBE: National Bank of Ethiopia

NIB: Nib International Bank S.C.

NII: Non-Interest income

NPL: Non-performing loans

REM: Random Effect Model

WB: Wegagen Bank S.C

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Abstract

The main objective of commercial banks is profit creation because commercial banks are involved in deposit mobilizing and lending which have direct impact on their lending rate. Hence, this study examines factors affecting lending interest of selected commercial banks in Ethiopian. The data covered the period from 2015-2022 G.C for the sample of selected eight Private commercial banks. Quantitative research approach and explanatory Research design were adopted in carrying out this research. Secondary data were collected from the selected eight private commercial banks using purposive sampling technique and macro-economic data are collected from NBE and World Bank report while internal factor data were collected from audited financial statements. The study used both descriptive and inferential statistics. Mean and standard deviation were used as descriptive statistics, whereas correlation and panel regressions were used from inferential statistics using stata. This study has used 'lending interest rate' as dependent variable, while: deposit rate, bank size, liquidity ratio, operating cost, profitability, non-interest income, exchange rate, and inflation rates are explanatory variables. The estimated regression results reveal that the operating cost, profitability, non-interest income, and inflation rates had significant and negative effect on lending interest rate. Deposit rate, bank size, liquidity ratio, has positive and statistically significant effect on lending interest rate. Exchange rate has negative and statistically insignificant effect on lending interest rate of Ethiopian private commercial banks. The study recommends to Private commercial banks should manage their internal inefficiencies; from the regression result operating cost to total asset ratio and lending interest rate negative relationship in private commercial banks of Ethiopia. This result is justified as high operating costs are likely to include costs due to inefficiency leading to lower lending interest rate. The private commercial banks should give more attention in reduction of operating cost, to improve its efficiency of banks' intermediation, by using advanced technologies. The Study also recommends to policy makers the Competition in the banking sector should be further enhanced and supported by policies that encourage and foster competition in the banking sector. Measures to promote the growth and image of small and medium sized banks, in an effort to increase their ability to penetrate markets and break dominance by few large banks

Keywords: Ethiopian commercial banks' lending interest rates; bank-specific factors; macroeconomic factors; OLS estimation linear regression model;

CHAPTER ONE

1. INTRODUCTION

1.1. Background of the study

In human societies, since the evolution of money, there have always existed those who possess money in excess of their immediate needs (surplus economic unit) and those whose current possession cannot finance their economic activities (deficit economic unit). The realization by the surplus economic unit that their excess can be used beneficially to meet the shortfalls experienced by the deficit economic unit led to the introduction of a credit system. This system was initially characterized by lenders and borrowers having to search out themselves and deal directlydirect financing Indirect financing includes the aggregation of deposits from various households, firms and government by commercial banks for lending to the deficit unit; the repayment of the loan is made to the bank which also stands ready to redeem deposits withdrawals by the surplus unit(Akpanuko and Acha 2010).

A bank is a financial institution licensed to receive deposits and make loans. Banks may also provide financial services such as wealth management, currency exchange, and safe deposit boxes. There are several different kinds of banks including retail banks, commercial or corporate banks, and investment banks. In most countries, banks are regulated by the national government or central bank (Adam Barone, 2022).

commercial banks are the financial institution that accepts deposits, offers checking account services, makes various loans, and offers basic financial products like certificates of deposit and savings accounts to individuals and small businesses. Commercial banks are the most important saving mobilization and financial resourceallocation institutions. Consequently, these roles make the man important phenomenon ineconomic growth and development. In performing this role, it must be realized that banks have the potential, scope and prospects for mobilizing financial resources and allocating them to productive investments. Therefore, nomatter the sources of the generation of income or the economic policies of the country, commercial banks would be interested in giving out loans and advances to their numerous customers bearing in mind, the three principles guiding their operations are profitability, liquidity and solvency (Olokoyo, 2015).

Credit is a financial market activity where financial institutions are empowered by law with credit functions to extend credit facilities to deficit economic units. The monetary authorities

use credit policies to achieve macroeconomic growth. For instance, credit policies are used to achieve growth in some sectors of the economy. Credit represents the bulk of the institution's assets, while interest on the credit represents the major source of income to the financial institutions. Credit is the aggregate amount of funds provided by financial institutions empowered with credit function to individuals, business organizations and government (Timsina, 2014)

Interest rate is one of the important terms in the lending decision process of commercial banks. Private 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).

Among the functions of a modern bank, lending is one of the most important activities. Bank loan is typically the largest as stand the predominant source of income for banks. It is evident that a substantial proportion of the total revenue of all commercial banks comes from interest on loans and advances. Loans and advances comprise very large portion of banks total assets and they also form one of the most essential operations of a bank. Banks accept customer deposits and they use the funds to grant loans to borrowers or invest in other assets that will yield a return higher than the amount that bank pays to the depositors (Mac Carthy, 2018).

Commercial banks' lending interest rate can be affected by internal or bank specific and external or non-specific factors. The internal factors are individual bank characteristics which affect the bank's lending interest rate; such as bank size, volume of deposit, cash reserve requirement ratio, profitability ratio, liquidity ratio these factors are basically influenced by the internal decisions of management and board. The external factors are sector wide or country wide factors such as gross domestic product, exchange rate and inflation which are beyond the control of the company and affect the profitability of bank (Ongore & Kusa, 2013)

The lending rate indicates the cost of borrowing funds from banks for business; this makes it critical for the expansion of economic activity in a country. While it is evident that the lending rate is crucial for the progress and development of all types of commercial activities, the most important thing is to distinguish the determinants of the lending rate in an established and integrated banking sector regulated by a central bank (Aliet et al., 2016).

According to directive No.NBE/INT/11/2010, Lending interest rates percent per annum to be

freely determined by each bank. And the commercial banks were allowed too freely quote their own bank lending rate based on a standardized formula, which takes the funding cost into account. The standardized formula is matched to ensure that the bank lending rate will move in synchronization with market conditions. A further benefit of the bank lending rate is that it would be reflective of both movements in cost of funds and lending rates. Banking industry in Ethiopia is still growing and it should ensure that effective strategies are put in place to lending interest rate. Moreover, the interest rates charged on loan by commercial banks have been a sensitive and recurring policy issue in Ethiopia and one which requires an objective examination of the factors that influence commercial banks' lending interest rates.

Therefore, the main purpose of this study is to analyze the financial data of private commercial banks of Ethiopia, depending on the audited annual financial statements of banks and national bank of Ethiopia for financial year from 2015 to 2022 in order to examine the factors that determine bank's lending interest rate and investigate their significant effect on dependent variable (lending interest rate) by classifying the variables in to internal bank specific factors such as effects bank size, profitability ,operational cost, deposit rate and non-interest income and external or nonspecific factors such as exchange rate and inflation rate on selected private commercial banks of Ethiopia.

1.2. Statements of the problem

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

Lending interest rate is the cost of borrowing for the peoples who take loan from the banks and deposit rate is the reward for the depositors for lending money. 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. On the other hand, they cannot charge too high loan rates because they will not be able to keep the banking relationship with the borrowers with high lending interest rate. Thus, determination of the appropriate bank lending interest rates usually becomes a main issue in banking industry. Furthermore, the factors that determine the level of banks' lending rates are important concerns for bank industry, the economy, and to policy makers (Bhattarai, 2015).

Low lending interest rates encourage and stimulate borrowing for businesses, households, economic investments, employment, national income, and leading to increased productivity.

Lower lending rates in an economy help businesses to grow. This is because firms can easily access funds to expand their business at a cheaper rate. Individuals can also access funds for mortgages and other personal development (Baumol and Blinder, 2018).

Banks have to be thoughtful in offering more loans because as they offer more loans to customers they expose themselves to liquidity and default risks which negatively affect banks' profits and survival. Therefore, it is very important for banks to clearly know the determining factors of good lending so as to reduce risks while increasing their return (Rasiah, 2010).

Cihak (2004) investigated the factors influencing lending interest rates in Croatia from 1999 to 2003. The result of the study indicated that liquidity ratio have a negative effect on lending interest rates is inconsistent with Ali et al., (2016) the study examines potential inner factors of the lending interest rate in the commercial banking sector in Pakistan. The findings of this study revealed that liquidity ratio have a significant and positively relationship with lending interest rate. While, we see in Ethiopia there are some empirical study conducted on this issue to the knowledge of the researcher. Generally the studies conducted in developed, emerging, developing and Sub-Saharan African countries found bank industry, macroeconomic and bank specific factors that affect lending interest rate of commercial banks, but it depict variation in results since, and countries differ each other by their economic, financial regulatory and operating environments.

Commercial banks' lending performance is affected by external and internal factors. External factors are macroeconomic variable like inflation, exchange rate, GDP and others which are out of the control of the bank. On the other hand bank specific factors which are internal to the bank include bank size, volume of deposit, liquidity ratio, profitability ratio and operating cost. However, the lending rates in Ethiopia are relatively high as evidenced from the margin held by banks, thus limiting access to capital and inhibiting economic growth. Economists and academics argue that high interest rates are a barrier to economic development. High lending rates scare borrowers because borrowing at a high rate was difficult for them to settle their obligation. In Ethiopia as far as the researcher's knowledge the most studies conducted with regard to determinants of commercial bank lending behavior.

Mitku (2014) examined the main determinants of commercial banks' lending in Ethiopia by using panel data of eight commercial banks in the period from 2005 to 2011. He tested the relationship between commercial banks' lending and its some determinants (bank size, credit risk, gross domestic product, and investment portfolio, volume of deposit, interest rate, and liquidity ratio and cash reserve required). The result suggests that, there is positive and statistically significant relationship between commercial bank lending and its size, liquidity ratio, credit risk, and gross domestic product and there is a positive but insignificant relationship between commercial bank lending and deposit, investment portfolio, cash reserve required and interest rate for the study period.

Amano Getahun(2014) in his working paper empirically investigated the determinants of lending behavior of commercial banks in Ethiopia. The result of the study revealed that volume of deposit, bank size, Cash reserve requirement, and inflation rate has positive and significant impact on loan and advance whereas liquidity ratio and interest rate has negative and significant impact on loans and advances. Even though GDP positively affected loans and advances, its impact is insignificant.

Berhanu (2016) investigate the determinants of lending decision of private commercial banks in Ethiopia and the impact of those factors on the financial performance of the banks. The results of panel data regression analysis showed that Liquidity ratio, Capital adequacy ratio, Inflation rate and gross domestic product has positive and statistically significant effect on banks' lending. Nonperforming loans, Cash reserve requirement, and lending interest rate had negative and statistically significant effect on banks' lending. Volume of deposit had positive but insignificant effect on banks' lending.

Therefore, further empirical evidence could provide additional insight about the determinants of lending interest rate by using much recent dataset and it needs further investigation in Ethiopian context. To the knowledge of the researcher there is some empirical studies done regarding determinants of lending interest rate on private commercial bank in Ethiopia and mostly related study focused on bank performance, profitability and bank lending behavior rather than determinants lending interest rate. Therefore this paper is designed to fill the time and knowledge gap by investigating bank specific, industry and Macroeconomic factors that could possibly affects the variability of lending interest rate in Ethiopian private commercial banks.

1.3. Research Questions

Based on the problem stated in this study, the researcher develops the following research questions.

1. What are the internal/Bank specific/ factors that affect bank lending interest rates in private commercial banks of Ethiopia?
2. What are the macroeconomic/external/ factors that affect banklending interest rates in private commercial bank of Ethiopia?

1.4. Objectives of the Study

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

1.4.1. General objective

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

1.4.2. Specific objective

- ❖ To investigate the internal factors that influences banks' lending interest rate in selected private Ethiopian commercial banks.
- ❖ To examines the external factors that affects banks' lending interest rate in selected Ethiopian Private commercial banks.

1.5. Hypothesis

The research hypothesis is a predictive statement that relates an independent variable to a dependent variable (Kothari, 2004). In line with the broad purpose statement, the following hypotheses are formulated for investigation. Hypotheses of the study stand on the theories related to Lending interest rate have been developed over the years by different researcher's and past empirical studies related to commercial banks " lending interest rate. The results from the literature review were used in the direction of establishing expectations for the connection of the various determinants. As we say above hypothesis was developed from prior empirical studies and theoretical framework or comes from prior pieces of literature and studies on the topic. The hypotheses of this study stand on the prior empirical studies and theories related to determinants of private banks" lending interest rate that have been developed over the years.

Prior studies and theories proposed the following research hypothesis.

HINT: - this hypothesis has developed based on the theories and empirical review literature write in chapter two, but this shows only directions. However, all independent variables have a hypothesis in chapter two supported by theories and empirical pieces of evidence.

H1: Deposit rate has positive and significant effect on banks' lending interest rate

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

H3: Profitability ratio has negative and significant effect on banks' lending interest rate.

H4: Operating cost has positive and significant effect on banks' lending interest rate

H5: Non-interest income has negative and significant effect on banks' lending interest rate.

H6: Annual exchange rate the country has positive and significant effect on lending rate.

H7: Inflation of the country has positive and significant impact lending interest rate.

H8: Liquidity ratio has positive and significant impact on banks' lending interest rate

1.6. Significance of the Study

The study may provide a significance to different stakeholders as it aims in identifying factors that determine banks' lending rate. First and foremost, the study helps management of banks to make them aware and to give due attention about the variables that affect lending interest rate. The result of the study will give a benefit to future researchers who will make use of the findings to conduct further research work in the area of lending interest rate of private commercial banks in the country. The findings of the study will expose the relevant factors affecting the lending interest rate of the private commercial banks. By implication, this will aid the relevant regulatory authorities and policy makers in formulating appropriate policies that will enhance effective administration and management of loans, credits and other forms of lending by commercial banks in the economy. Furthermore, the findings of the study will be of immense benefit to commercial banks in terms of using them as inputs in formulating guidelines with which to effectively manage their lending activities in the economy.

1.7. Scope of the Study

The research mainly concentrated on determinants of private commercial banks' lending interest rate in Ethiopian and made the analysis using secondary source of data. The study had taken in to account the performance of banks for the last 8 years that is from 2014/2015 to 2022. This period has chosen due to the availability of much recent as well as updated data

and yet considered reasonably long enough to provide adequate analysis and investigation in this study. Due to the number of private commercial banks in the country are more than 29, this study assumed to consider a sample of private commercial banks. As a result, the research included Ethiopian private commercial banks that started their operation before 2005, which are 9 private commercial banks who operate in Ethiopia. Those banks are Awash bank, Dashen bank, Bank of Abyssinia, Wegagen bank, Hibret bank, Nib International Bank, Cooperative Bank of Oromia, Lion International Bank and Oromia International Bank those are fully operated from the year 2015 to 2022 G.C. The balance sheet and profit and loss statements of eight Ethiopian private commercial banks data were collected from NBE. In addition, the study used bank sector data and country wide macroeconomic data that were driven from National Bank of Ethiopia and MoFEC. The study used lending interest rate as dependent variables and deposit rate, bank size, liquidity ratio, profitability ratio, operating cost to total asset ratio, Net interest income, Exchange rate and inflation rate were taken as explanatory variables. These variables could explain the topic properly by referring previous empirical works.

1.8. Structure of the study

This study will mainly focus on the identification of both the internal (bank-specific factors) and the external factors which includes the industry-specific factors as well as the broader macro-economic factors that can affect the lending interest rate of privately owned commercial banks in Ethiopia. This study is organized into five chapters. Introduction of the study with respect to Problem statement and objective of the study are presented in chapter one. Chapter two presents literature review of the study. In this chapter both the theoretical and empirical reviews pertaining to the determinants of lending interest rate are discussed. Research approach and methodology are presented under chapter three. Chapter four describes in detail the descriptive statistics, CLRM assumption and regression analysis found in the study. Finally, chapter five presents the conclusions and recommendations.

CHAPTER TWO

2. LITERATURE REVIEW

2.1. Banking industry in Ethiopia

In Ethiopia, modern banking started in 1905 with the establishment of Abyssinia bank based on, a private company controlled by the Bank of Egypt. In 1931 bank of Abyssinia was legally replaced by bank of Ethiopia shortly after emperor Haile Selassie came to power. With the Italian occupation (1936-1941), the operation of the bank of Ethiopia came to close, but a number of Italian financial institutions were working in the country and Operated in Ethiopia during 1942-1943.

In 1943, the State Bank of Ethiopia was established; it has the power of both commercial bank and national bank. In 1963, these functions were formally separated and the National Bank of Ethiopia (Central bank) and the Commercial Bank of Ethiopia were formed. In the period to 1974, several other financial institutions emerged including the state owned. The Agricultural and Industrial Development Bank (established largely to finance state owned enterprises); The Savings and Mortgage Corporation of Ethiopia; The Imperial Savings and Home Ownership Public Association (which provided savings and loan services).

Following the downfall of the Derg regime in 1991, the EPRDF declared a liberal economic system. In line with this, Monetary and Banking proclamation of 1994 established the National Bank of Ethiopia (NBE) as a judicial entity, separated from the government and outlined its main function. Monetary and Banking proclamation No.83/1994 and the Licensing and Supervision of Banking Business No.84/1994 laid down the legal basis for investment in the banking sector.

Ethiopia opened the gates of banking to private natives only in 1994, and the number of banks operating in the country in the fiscal year In 2015/16 the number of banks declined to 18 from 19 due to the merger of Construction & Business Bank with Commercial Bank of Ethiopia. Of the 18 banks 16 were private and 2 public. Those banks are, first private bank was Awash International Bank ,established in 1994 and it also a way to the establishment of related private banks such as Dashen Bank(1995),Abyssinia Bank (1996),Wgegan Bank (1997), hibret Bank (1998), Nib International Bank (1999), Cooperative Bank of Oromia (2004), Lion International Bank (2006), Oromia International bank(2008),Zemen Bank(2009), Buna International Bank (2009), Birhan International Bank (2010), Abay Bank

S.C.(2010), Addis international Bank SC.(2011), Debub Global Bank S.C. (2012), Enat Bank S.C. (2013) , was established (NBE,2018).

Currently Ethiopia's banking industry is fast growing as evidenced by the number of banks started up in the last two decades, since liberalization in the country. There are more than 31 commercial both public owned and private banks which are operating in the country.

2.2. Commercial banks

Banks are major financial institutions play an important role by transferring fund from surplus unit to deficit unit in the economy. Bank means a company licensed by the national bank to carry out a banking business or bank owned by the government. Banking business such as: receiving fund from the public via a means that the national bank has declared to be a certified manner of receiving fund, using the fund received the whole or in part for the account and at the risk of the person undertaking the banking business for loan or in the manner acceptable by the national bank, buying and selling of gold and silver bullion and foreign exchange, transfer fund to other local and foreign person on behalf of the bank themselves or their customers, discounting and negotiation of promissory note, draft, bill of exchange and other evidence of debt, any activities recognized as customer banking business. The definition points out those commercial banks are doing a business of finance. It does by collecting deposit on one side and make the loan using the collected finance in another side (NBE,2022).

2.1. Commercial banks' Lending

Bank loan is the amount of money (fund) available to a company or individual from the banking system. It is the combined of the amount of funds financial institutions are willing to provide to an individual or business. A company or individual's bank credit depends on both the borrower's capacity to repay and the overall amount of credit available in the banking system. Provision of loan by one party to another is termed as lending. Lending supposes the fact that the second party doesn't reimburse the first party immediately rather arrange either to repay or return those resources at a later date, making it a debt. Lending in its most general sense can be described as the temporary giving of money or property to another person with the expectation that it will be repaid. In a business and financial context, lending includes many different types of commercial loans and advances (Murray, 2014).

Financial institutions offering commercial bank lending primarily service the needs of corporations and large businesses. Also known as business banking, commercial banks are

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

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

Banks function as financial intermediaries, collecting funds from savers in the form of deposits and then supplying to borrowers as loans. In allocating funds, the primary objective of bank management is to earn income while serving the credit needs of its community. Lending represents the heart of the industry. Therefore, the main objective of commercial banks' lending is to maximize profit, although other social and economic functions tend to deflect banks from profit maximization as their primary objective (Behretal., 2013).

2.2. Commercial bank lending interest Rate

Lending interest rate means the cost of borrowing for the people who take loan from the banks. Low lending rates encourage and stimulate economic investments, leading to increased productivity, employment and national income. Businesses' investments in building, machinery, equipment's, new factories and other assets are stimulated when lending rates decreased. This is because lending rates that must be paid on borrowing is a key element of the cost of making an investment. Therefore, investors or business executives, Government will find investment prospects more attractive as lending rates decreased. Interest rate is a percentage charged for use of borrowed money. It is the opportunity cost of money (Baumol and Blinder, 2000).

Lending interest rates are primarily determined by factors affecting loans supply and demand.

Loan interest rate depends on total deposits and other sources of bank funds, the cost of their acquisition and risks to which banks are exposed in their lending activities. They also depend on regulation cost, banks operating costs and the fee paid to owners for the capital invested i.e. the profit margin. Each of the above specified elements depends on the effect of various factors.

Loan demand depends on the very interest rate. However, it also depends on the expectation regarding economic activities and price trends, which are also subject of various impacts. Therefore, the examination of the active lending interest rates must start from the fact that they are affected by numerous factors. It is not easy to group them as a whole, even in theory, in light of numerous various interdependencies of their effects (Branko Krnic, 2014).

Rates have the capability to play the intermediary role between potential lenders and borrowers. A high interest rate on deposits acts as an incentive for savers to part with their money and keep it with deposit taking institutions instead of putting the money in other different investment opportunities. A high rate of interest on lending for borrower translates to high borrowing costs which discourages potential borrowers due to the fact that it leads to high production costs which have a negative effect on returns (Kinyua, 2000).

This means that a balance has to be maintained for purposes of economic development in terms of investment. The rate of deposit has to be high in order to entice deposits which form part of the resources for lending while the lending rate has to be favorably low so as to attract borrowing for investment. As the level of interest rates increase, the level of loan accessibility by this target group decreases, and vice versa. Financial institutions are working hard to make their presence felt in the rural areas as was evidenced by the high rate of ownership of bank accounts by respondents in the area. Bankers have experienced numerous frustrations in their attempt to recover loans whose performance is in arrears through the judicial proceedings. This leads to the incurrance of additional expenses by the bank in lengthy litigation procedures. These costs form part of interest rates to be charged (Mathea, 2014).

The real interest rate is an interest rate harmonized with either realized or expected inflation rate is the relative price of consuming now rather than later. As such, it is a key variable in vital theoretical models employed in finance as well as in microeconomics - such as the consumption based asset pricing model (Lucas, 1978).

According to Keynes (1936), interest rate represents the cost of borrowing capital for a given period of time. Due to the fact that borrowing is a significant source of

finance for many firms, prevailing interest rates are of much concern to the firms due to the indexing of interest rate on borrowing arrangements of the firms ultimately affecting growth.

2.3. Determinants of Commercial Banks' Lending interest rate

Theoretically factors affecting commercial banks' lending or loan and advances are divided into two broad categories namely internal and external determinants. Internal factors are lending determinants of banking industry, which are; Bank size, volume of deposit, credit risk, liquidity ratio and lending interest rate. External factors are macroeconomic and regulator variables this are GDP, inflation and cash reserve requirement.

Banks are globally known as major actors in lubricating the economy through their intermediation role. Commercial banks efficiently channel funds from those who have surplus funds to those in need of it. This transformation process is affected by numerous factors which are bank-specific and macroeconomic. The bank-specific factors are relatively under the control of the management of the bank whereas the macroeconomic factors are out of the control of the management (Ujuju & Etale, 2016).

According to Mensah and Abor (2014) lending rate of banks is determined by a number of 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.

This study has examined the effect of the following determinants of private commercial banks' lending interest rate

2.5.1. Internal bank specific factors

Bank size

Bank size is considered as an important determinant of commercial banks' lending performance. Provide that large and complex banks tend to lend few loans to small scale firms (Berger and Udell, 2006).

Stein (2000) explains that small banks have comparative

advantages in producing soft information whereas large banks also have comparative advantages in lending based on hard information.

On the other hand, when large and complex banks are able, through technical expertise, to process soft information about small scale firms, then there would be a positive relationship between bank size and lending performance. Due to the fact that large banks have economies of scale advantage to provide loans and advance efficiently; their capability to provide large amount of loans and advance when needed by the borrowers; having better capability of providing different types of loans and advances menu to their customers; and their better capability to be more accessible to their borrowers, there will be a positive relationship between bank size and loans and advance disbursement of commercial banks. Bank size was also established to be a great determinant of lending rate of commercial banks as larger banks lacked the ability to offer lower lending rates as the interest spread maintained was lower compared to that of the smaller banks (Uchida et al., 2007) and (Obamuyi, 2013).

The bank's total asset is another bank specific variable that affects the lending rate of banks. It is a variable that is used to measure the economic scale or general capacity to undertake its intermediary function. In most of the studies on banking, the bank's total assets are used as a proxy. The bank size is measured by the natural logarithm of total assets as noted by Demirguc-Kunt et al. (2004).

Some authors suggest a positive relationship between the size of a bank and lending rates. They argue, the larger the average size of the operations, the larger the risks concentrated in single customers and the higher the lending rates (Liebeg & Schwaiger, 2006 and Maudos & Guevara, 2004).

Deposit interest rate

A bank accepts customer deposits and uses that fund to grant loans to borrowers or invest in other assets that will yield a return higher than the amount bank pays the depositor. Customers' deposit is the primary source of bank loan. And thereby, deposits directly have a positive impact on lending performance (McCarthy et al., 2010).

Most business organizations, especially in developing countries are highly dependent on bank loans as a source of capital and the ability of banks in giving loans depends much on their ability to attract deposits. This is because an increasing trend in deposit mobilization implies more liquidity for the banks and more funds will be available for lending, thereby increasing the ability of the banks to make more profit (Haron and Azmi, 2006).

Profitability ratio

Profitability ratio is measured as net income divided by total assets. Bank Profitability indicator profitable banks have the capacity to implement modern credit risk management system, technology and hiring trained manpower or experts as well as having credit information access so that it contributes for low lending rate found that negative association between lending rates and profitability (return on assets). They asserted that increases in bank cost tend to be passed on to borrowers in the form of higher lending rates, and that factors that help improve bank income also tend to benefit borrowers by lowering the interest rates they pay. A negative relationship is expected between lending interest rate and profitability ratio. It is hypothesized that return on average assets influences banks' lending rates and also banks with high return on average assets offer lower interest rates on loans (Atakelt, 2015).

They asserted that increases in bank cost tend to be passed on to borrowers in the form of higher lending rates, and that factors that help improve bank income also tend to benefit borrowers by lowering the interest rates. A negative relationship is expected between lending interest rate and profitability Mbao, et. al (2014).

Liquidity ratio

Liquidity is the ability to meet its financial obligations when they become due. Bank lending finances investments which are relatively illiquid assets, but it funds its loans with mostly short term liabilities. Thus one of the main challenges of commercial banks is ensuring its own liquidity under all reasonable conditions and claimed that commercial banks must pay more attention to liquidity than many other types of financial institutions such as life insurance companies. This results from the high turnover of their debt liabilities. This is due to the fact that liquidity is one of the major determinants of lending performance of commercial banks. Since loans are illiquid assets but financed by using liquid assets, when the bank lending increased, it reduces liquid assets of the bank. On the other side, when the bank needs to increase its liquidity level, it will reduce its loans. Therefore, liquidity has a negative effect on loans and advances of private commercial banks. Banks are normally faced with this risk when they are unable to convert a security or an illiquid asset to cash without a substantial loss of income or capital. Liquidity is considered to be the life and blood of commercial banks. Examples of liquidity risks banks usually face are funding and time risk (Goldfeld and Chandler, 1980).

According to Emeri, (2016), banks can measure their liquidity risk using any of the following ratios; loans/total assets, purchase funds/total assets, loans/core deposits. In this study

liquidity measurement used is liquid asset/total assets. Banks' are usually faced with liquidity risk and are unwilling to give out loans when they are unable to convert an illiquid asset to cash without a substantial loss of capital and exhibited a negative relationship between liquidity and lending and it was significant. Thus, a negative relationship is expected between liquidity and bank lending rate decision or behavior.

Operating cost

Theory indicates that variation in operating expense is reflected in variation in bank lending interest rate, as banks pass their operating costs to borrowers. The costs of intermediation (screening, monitoring, branching costs, etc.) have a positive effect on the interest rate on loans. Several studies show that there is a positive relationship between operating expenses and lending interest rate of commercial banks. This is because banks bearing higher average operating expenses may resort to charge higher margins to offset higher operating costs (Maudos & Guevara, 2004 and Carbo & Rodriguez, 2007).

According to Demircuc-Kunt and Huizinga (1998) banks pass their overhead and operating cost to their customers in the form of high interest rate. It has been observed that the high cost of operation is one of the major contributing factors that lead to high cost of funds of commercial banks. Banks that are less efficient in their operation exhibit higher operating costs and are characterized by higher interest rate. And for banks to stay in business they must pass this cost to the borrowers in the form of higher lending rate.

Lerner (1981) argued that banks face operating expenses while acting as financial intermediaries. As the total cost of operation increases, the banks' net income is expected to decrease. As a result, it is common for banks to charge higher interest. Even in the absence of market power and risk, a positive margin is necessary to cover the operating costs.

On the other hand, higher operational efficiency may induce banks to pass the lower costs to their customers in the form of lower loan rates and found a positive relationship between overhead cost and lending interest rate of banks (Ahmet & Hakan, 2010).

The study made by Mbao, Kapembwa, Mooka, Rasmussen and Sichalwe (2014) in Zambia found that high lending rates are primarily a reflection of high costs of doing business. The researcher argues that operating costs and lending interest rate are positively related because banks that incur high costs will work with higher lending rates to enable them cover the high costs. Thus, operating expense to total assets ratio is the determinant factor in lending rates. They found that operating costs have a positive

effect on lending interest rates. Operating inefficiency had positive influence on lending rates. It implies that increasing the level of inefficiency tends to increase cost. In line with theory and past empirical evidence, an increase in operating costs is expected to have positive influence on lending interest rate.

Non-Interest Income

Non-interest income reflecting product diversification refers to all the income of a commercial bank other than the interest income. It also broke down into four primary components: fiduciary income, service charges, trading revenue, and fees and other income. Fiduciary income is revenue related to the bank's fiduciary operations such as administering investments for others. Service charges include revenue directly related to deposit accounts like ATM or check usage fees. Trading revenue is primarily income from the net gain or loss recognized from trading cash instruments, off-balance contracts, and market-to-market

Changes in the carrying value of assets and liabilities. Fees and other income include all other fees such as loan commitment fees, safe deposit boxes, commissions, and land rental fees (Stiroh (2002)).

The product diversification measured by the non-interest income variable has a significant negative coefficient on loan pricing of Indian banks suggesting possible cross-subsidization of traditional lending activities. Thus, banks decrease their lending rate when they are more reliant on fee generating products (Ansari (2015)). Based on this there is a negative relationship between lending interest rate and non-interest income.

2.5.2. External macroeconomic factors

The external determinants of private commercial bank lending rate are those factors which are external to the commercial banks and hence outside the control of management.

As indicated by

Athanasoglou et al. (2005) the external determinants are variables that are not related to bank management but reflect the economic and legal environment that affects the operation and performance of financial institutions.

The following sections discussed about external determinants of commercial bank lending interest rates such as exchange rate and inflation.

Exchange rate

The exchange rate is the number of units of a given currency that can be purchased for one unit of another country's currency. The exchange rate tells the relative value of any two values. Countries have different policies concerning their currency exchange rate. In the floating exchange rates system, the currency's foreign exchange rate is allowed to fluctuate freely by supply and demand for the currency. In a fixed exchange rate system, the government intervenes to offset changes in exchange rate caused by change in the currency's supply and demand. A managed floating exchange rate system, which falls somewhere between the fixed and floating system. In the managed floating exchange rate system, the currency's exchange rate is allowed to fluctuate in response to change in supply & demand, but the government may intervene to stabilize the exchange rate in the short run, avoiding short-term wild fluctuations in exchange rate. When a country loses value relative to other currencies, we say that the currency has "depreciated" when it is determined by demand and supply and "devalued" when the government intervenes; the reverse is called "appreciated" and "revalued" (Fabozzi, 2009).

According to (Illo, 2012), it was found that the foreign exchange rate has a negative and significant effect on profitability. A possible reason for this could be that in many Kenyan commercial banks, there was a deficit of foreign currency and do not earn service charges from foreign transactions like letters of credit (LC) and Cash against document (CAD). This implies that as the value of domestic currency against foreign currency decreases, it has a positive impact on exports of the country. This helps to boost the export of the country and imports become expensive.

Inflation rate

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

rate of inflation induces banks to ration credit. It has been suggested that the credit that universal banks lend to their customers reduces as inflation increases. This variable is expected to be positively correlated with lending rate (Banda, 2010)

The study of Naceur (2009) offers the following explanation: the main activity of banks (mostly commercial) is lending and the market is therefore based on an offer of credit (provided by banks) and demand (the individuals and companies). Inflation reduces the demand for credit because it increases uncertainty about the future. However, it has been proven that for individuals and businesses, if their level of risk aversion varies widely, it increases uncertainty (ambiguity-aversion). This drop in demand would lead to a decline in lending and therefore a decrease in performance.

2.6. Empirical Review

In this section, we review other country and Ethiopian studies that have been previously done by various researchers and are related or are relevant to the research study.

2.6.1. Empirical review on other country

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

Olokoyo (2011) investigated the determinants of commercial banks’ lending behavior in the Nigerian context. The study was aimed to test the determinants of commercial banks’ lending behavior and how it affects the lending behavior of commercial banks in Nigeria. The model used is estimated using Nigerian commercial banks loan advance and other determinants or variables such as their volume of deposits, their investment portfolio, interest rate, stipulated cash reserve requirements ratio and their liquidity ratio for the period; 1980–2005. The model hypothesizes that there is a functional relationship between the

dependent variable and the specified independent variables. From the regression analysis, the model was found to be significant and its estimators turned out as expected and it was discovered that commercial banks deposits have the greatest impacts on their lending behavior.

The study made in India by Jugnu Ansari (2015), had investigated determinant of lending rates under the study title "Determinants of Commercial Banks Loan Pricing". Using the dynamic panel data methodology and annual data for a sample of major 33 banks including public, private and foreign banks over the period 1996-2014, the study finds significant impact of various bank specific factors, regulatory and supervisory indicators and macroeconomic factors on the banks' loan interest rates. Regarding the bank specific variables, loan interest rates and their spreads showed statistically significant positive relationship with operating cost, profitability and capital adequacy, loan maturity, product diversification measured by the non-interest income, asset quality, bank size and liquidity indicators. Macro variables such as GDP growth and inflation rates showed positive impact on loan interest rates. These findings highlight the roles of operating efficiency, risk aversion, asset-liability management, and credit risk management in commercial banks loan pricing decisions.

Akinyomi Oladele John (2014) examined the effect of deposit volume on bank lending behavior in the Nigerian Post-consolidation banking era. The result of the regression analysis revealed that the independent variable (Volume of Deposit) has a significant and positive relationship with the dependent variable (Loan and Advances) on the Nigerian deposits money banks. Therefore, John recommended bank management to devise new methods of enhancing customers' deposits.

The study made in Kenya by Fridah Gatwiri Kinyuru (2011) under the research topic "Determinants of lending rate of Commercial Banks in Kenya", conducted a census survey on 44 commercial banks in Kenya aiming to establish factors determining lending rate. The study has found that market structure, cost of funds and economic conditions as the main determinants of commercial banks' lending rate. The study concluded that cost of fund (loan) is highly determined by taxation cost of provisioning, core liquid asset requirement, transaction costs, central bank supervisory fee, cost of capital (return on equity), the statutory reserve requirement, management fees, staff costs, weighted average deposit rate, reserve requirements, mandatory investment level required by the central bank, inflation conditions, economic growth and foreign exchange rates.

2.6.2. Empirical Review in Ethiopia

The related study in Ethiopia conducted by Belay Getachew (2015), has investigated factors that

determine cost of financial intermediation under the research title Determinants of cost of financial intermediation on Commercial Banks of Ethiopia. The researcher has used balanced fixed effect panel regression for the data of sampled 8 commercial banks over the period from 2000 to 2013. The study has selected and analyzed eleven independent variables affecting net interest margin (interest income on loans to total loans minus interest expense on deposits to total deposits). The regression analysis estimated by fixed effect regression model showed that overhead costs, loan loss provisions, capital, asset size, liquidity risk, opportunity cost of reserve, market concentration, market share, economic growth and inflation had a significant effect on net interest margin or financial intermediation cost in Ethiopian banking sector. However, according to this study, return on asset seems insignificant in explaining the variation of lending interest rate.

The study made by Meshesha Demie (2016), has examined determinants of net interest margin in the Ethiopian banking sector using a regression model based on consolidated industry data. The study has used data of sixteen commercial banks with more than three years of service in banking industry. The study employed unbalanced panel data model to account the effect of data variation arising from years of service between different banks, and it has examined twelve independent variables that determine net interest margin (interest income minus interest expenses divided by total earning assets). The estimation result of the study revealed that cost efficiency, implicit interest payment, competition and scale efficiency (market share of loan) have positive and significant effect while, management efficiency has negative and significant effect on determination of net interest margin. On the other hand, credit risk, interest rate risk, capital risk, inflation and economic growth do not seem to have significant impact on net interest rate.

Amano Getahun (2014) in his working paper empirically investigated the determinants of lending behavior of commercial banks in Ethiopia. In his study, balanced fixed effect panel regression model was used for the data of eight commercial banks in the sample covered the period from 2001 to 2013. The study covered all commercial banks working in the period of the study. Seven factors affecting banks' loans and advances were selected and analyzed. The result of the study revealed that volume of deposit, bank size, Cash reserve requirement, and inflation rate has positive and significant impact on loan and advance whereas liquidity ratio and interest rate has negative and significant impact on loans and advances. Even though GDP positively affected loans and advances, its impact is insignificant. At last, Amano generally recommended that commercial banks should focus on mobilizing more deposits as this will enhance their lending performance and should formulate critical, realistic and comprehensive strategic and financial plans.

Mitku (2014) examined the main determinants of commercial banks' lending in Ethiopia by

using panel data of eight commercial banks in the period from 2005 to 2011. He tested the relationship between commercial banks' lending and its some determinants (bank size, credit risk, gross domestic product, and investment portfolio, volume of deposit, interest rate, and liquidity ratio and cash reserve required). Seven years financial data of eight purposively chosen commercial banks were used for analysis purpose. Ordinary least square (OLS) technique was applied to determine the impact of those predictor variables on commercial banks' lending. The result suggests that, there is positive and statistically significant relationship between commercial bank lending and its size, liquidity ratio, credit risk, and gross domestic product. But, there is a positive but insignificant relationship between commercial bank lending and deposit, investment portfolio, cash reserve required and interest rate for the study period.

2.7. Summary of the literature review and knowledge gaps

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

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

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

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

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

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

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

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

In Ethiopia, as far as the knowledge of the researcher is concerned, there are some types of related researches conducted in this area but those researchers have entirely focused only on determinants bank performance, determinants of banks' profitability and determinants bank lending behavior rather than determinants lending interest rate. Hence there are some empirical study in Ethiopia concerning the effect of bank specific factors, industry-specific factors and macro- economic factors variables (deposit rate, bank size, liquidity ratio, ,operating cost to total asset ratio, profitability, market concentration, inflation rate) on lending interest rates that are not tested by prior Ethiopian researchers.

Therefore, further empirical evidence could provide additional insight about the determinants of lending interest rate by using much recent dataset and it needs further investigation in

Ethiopian context. To the knowledge of the researcher there is few empirical studies done regarding determinants of lending interest rate on private commercial bank in Ethiopia and the related study in Ethiopia focused on bank performance, profitability and bank lending behavior rather than determinants of lending interest rate. In general, lack of sufficient research study on the determinants of lending interest rates in the context of Ethiopian banking sector initiates this study. Therefore this paper is designed to fill the knowledge gap by investigating bank specific, industry specific and Macroeconomic factors that could possibly affects lending interest rate of Ethiopian private commercial banks by using much recent dataset.

2.8. Conceptual framework of the study

The overall objective of this study is to identify and analyze the factors that determine lending interest rates of commercial banks proxy by average lending rate in Ethiopia using the variables based on various related theories and empirical literatures. Empirical evidences suggest that, bank lending interest rate is affected by internal and external factors.

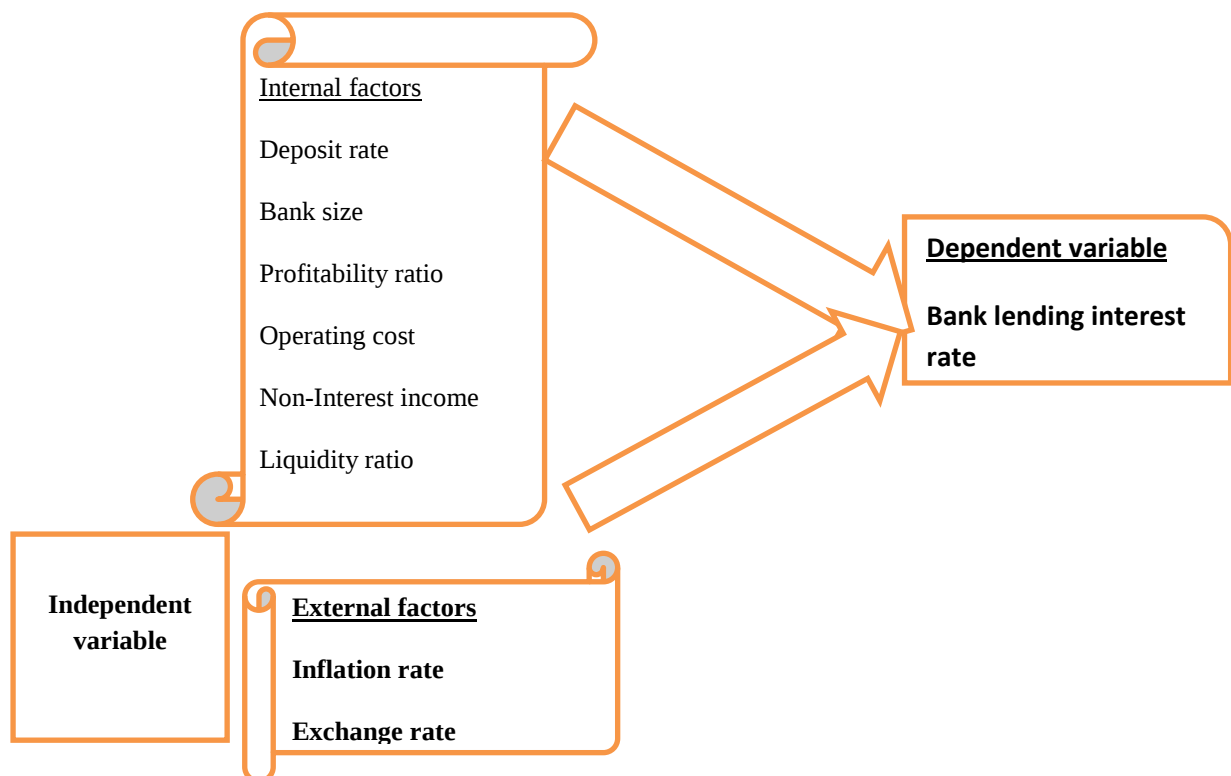


Figure 2.1. Schematic conceptual frame work (Source: researcher compilation from literatures)

CHAPTER THREE

3. RESEARCH METHODOLOGY

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

3.1. Research Design

The research methodology begins by presenting the overall research design, as the research design provides an important framework and guidelines on how to collect and analyze data. The choice of appropriate research design will help the researcher to answer the research questions and to satisfy the research objectives.

As noted in Creswell (2009) research design is a plan or proposal to conduct research. It involves the intersection of philosophy, strategies of inquiry and specific methods

Depending on the specific purpose that the researcher tries to address, research can be classified as descriptive, explanatory and exploratory studies. Descriptive research sets out to describe and to interpret what is and it looks at individuals, groups, institutions, methods and materials in order to describe, compare, contrast, classify, analyze and interpret the entities and the events that constitute the various fields of inquiry. It aims to describe the state of affairs as it exists. On the other hand, explanatory research, aims at establishing the cause and effect relationship between variables. The researcher uses the factors or information already available to analyze and make a critical evaluation of the data/information. Exploratory research is less formal, sometimes even unstructured and focuses on gaining background information and helps to better understand and clarify a problem. Therefore, this study is an explanatory research was used since, aim at establishing the cause and effect relationship between variables.

3.2. Research Approach

Besides, there are three types of research approach namely qualitative, quantitative and mixed approach. Qualitative research approach involves studies that do not attempt to quantify their results through statistical summary or analysis. Quantitative research is the systematic and scientific investigation of quantitative properties and phenomena and their relationships. The objective of quantitative research is to develop and employ mathematical models, theories and hypotheses pertaining to natural phenomena.

Therefore, in this study the quantitative research approach was used,

since quantitative nature of the data used.

3.3. Sample Design

Sample design deals with population, 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 (Adams, 2014). A sample is drawn to overcome the constraints of covering the entire population with the intent of generalizing the findings to the entire population.

3.3.1. Population of the study

The study population includes all private commercial banks that are operating in Ethiopia. According to NBE report, at the end of June 30, 2023 there are more than twenty nine privately owned commercial banks. These are Awash International Bank S.C, Dashen Bank S.C, Bank of Abyssinia S.C, Wogagen Bank S.C, Hibret Bank S.C, Nib International Bank S.C, Cooperative Bank of Oromia S.C, Lion International Bank S.C, Oromia Bank S.C, Zemen Bank S.C, Buna International Bank S.C, Berehan International Bank S.C, Abay Bank S.C, Addis International Bank S.C, Debu Global Bank S.C, Enat Bank S.C, Amhara Bank S.C, Tsehay Bank S.C, tsehay Bank S.C, Gohbetoch Bank S.C, Ahadu Bank S.C, Sinke Bank S.C, Shebele Bank S.C, zemzem Bank S.C, sidama Bank S.C, Hijera Bank S.C, Geda S.C and ramis banks S.C.

3.3.2. Sample technique and frame

To conduct this study the researcher used Purposive /judgmental sampling. This technique is one of the non-probabilistic sampling techniques used a non-probabilistic sampling approach. According to (Saunders, M., Lewis, P. and Thornhill, A, 2012), Purposive/judgmental sampling, is a non-probability sampling technique, used when elements selected for the sample are chosen by the researcher's judgment. Purposive sampling is used when there is large population size, to select a member of a difficult to reach specialized population and to identify particular types of respondents for in depth investigation. By considering the access of full data for the selected time period, due to large population size and time resource constraints the researcher used purposive sampling technique.

3.3.3. Sample size Determination and Sample size

The sample included in this study those private commercial banks having long year banking operation experience and availability of data from year 2015 to 2022. The selection of the sample period was based on the intention to increase the degree of freedom and to meet the requirements of the estimation procedure. Inclusion of banks that do not have data for the whole sample period specified above would lead to unbalanced panel data which may fail to satisfy the assumptions of model which was based on data. Thus, banks that were established after the year 2015 have excluded from the sample to satisfy the balanced data requirement of the model. Because of this, from more than 29 private commercial banks operating in the country, this study taken sample of nine bank's audited financial statements were available within the study period namely: Awash International Bank S.C, Dashen Bank S.C, Bank of Abyssinia S.C, Wegagen Bank S.C, Hibret bank S.C, Nib International Bank S.C, Cooperative Bank of Oromia S.C, Lion International Bank S.C and Oromia International Bank S.C. As a result, a sample of 72 observations has used because it is viable in line with time and funds available for this study.

3.4. Source of Data

As noted in Gujarati (2009) there are three types of data available for empirical analysis namely: time series, cross-section, and panel or pooled (i.e. a dimension of both time series and cross section) data. The nature of data used in this study enables the researcher has used panel data type.

To achieve the purpose of the study, the researcher depends solely on secondary data taken from audited financial statement, NBE and from World Bank. The data characterized as panel data, which capture both the cross section and time series dimensions. (Baltagi, 2005), cited in (Chen, 2022), described the advantages of panel data as a way to increase number of data points, degree of freedom, and to reduce co-linearity among explanatory variables that lead to improve the efficiency of econometric estimates. They noted additionally, it can also control for individual heterogeneity due to hidden factors that if neglected in time series or cross sectional estimation which leads to biased result. (Eric, 2019), Panel data, sometimes referred to as longitudinal data, is data that contains observations about different cross sections across time; minimize estimation biases that may arise from aggregating groups into a single time series, by this rational the researcher chooses to use panel data type.

3.4.1. Secondary source of Data

In this study, secondary source of data is used to meet the stated objectives. For this study has gathered from the audited annual financial statements of individual banks and national bank of Ethiopia for sampled private commercial banks within year eight periods from

2015 upto 2022. The data obtained from both sources was checked for consistency and reconciled based on the published annual reports of national bank of Ethiopia. In order to gather the required information which attains the research objectives, secondary data (annual audited financial statements) were collected.

3.5. Method of Data analysis and presentation

In this study, the researcher has analyzed based on panel data that were collected through structured document review. The data entered into the latest version of STATA (Statistics and data) software analysis which consists of descriptive statistics in terms of mean, percentage, tables, figures, charts and standard deviation. In addition to this, the researcher also concerned with the interpretation and the representation of justification. On the other hand, regression analysis, the most important part of the analysis, helps to identify the determining variables effect and draw relationship between dependent and independent variable. According to Brooks (2014) regression is concerned with describing and evaluating the relationship between a given variable (usually called the dependent variable) and one or more other variables (usually known as the independent variables). Thus, the researcher adopted panel data regression model to examine the effect of determinant factors on bank lending rate. For this purpose, stata software package was used.

Besides this, as noted in Brooks (2014) there are assumptions required to confirm that the ordinary least square (OLS) estimation technique and also hypothesis tests concerning the coefficient estimates could genuinely be conducted. If these Classical Linear Regression Model (CLRM) assumptions hold, then the estimators determined by OLS have a number of desirable properties and are known as Best Linear Unbiased Estimators (BLUE). Therefore, diagnostic tests were performed to ensure whether the assumptions of the CLRM are violated or not in the model. Diagnostic checking is done to test whether the sample is consistent with the following assumptions

3.6. Operationalization and Measurement of Variables

This study has attempted to see the relationship between the dependent and independent variables through testing the hypotheses regarding to the relationships between lending interest rate of banks and firm specific and macroeconomic factors affecting it in the case of private commercial banks in Ethiopia. It is apparent that the most significant task is to select the appropriate explanatory variables. The selection of variables was based on previous relevant studies like Gambacorta (2008) & Ali et al. (2016). Commercial bank lending rate is

dependent variables used in this study. It is measured in terms of interest income to average loan and advance. Besides, explanatory variables included in this study are deposit rate, liquidity ratio, profitability, Operating cost to total assets ratio, bank size, concentration, and Inflation rate.

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

3.6.1. Dependent Variable

Lending interest rate

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

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

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

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

bank characteristics and expected to have a strong influence on lending rates.

$$\text{LendingRate} = \text{Interest income} / \text{Average Loans and advance}$$

3.6.2. Independent Variable

Deposit interest rate

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

$$\text{Deposit Rate} = \text{interest expense} / \text{interest bearing deposit}$$

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

Bank Size

Bank size is the total assets of the bank. It measured by the natural log level of total assets of the bank. Bank size was also established to be a great determinant of lending rate of commercial banks as larger banks lacked the ability to offer lower lending rates as the interest spread maintained was lower compared to that of the smaller banks (Uchida et al., 2007) and (Obamuyi, 2013). This shows that larger banks have the ability to attract less expensive deposits and also free interest deposits thus favorable lending rates. The large size bank has the advantage of providing a large menu of financial service to their customers and

thereby mobilizes more funds which will lead to serving their customers with low lending rate. While small banks are forced to offer higher interest rates to attract fixed deposits thus resulting to high lending rates on advances (Berger & Udell, 1992 Bashiri, 2003 and Back et al., 2009).

Bank Size = natural logarithms of total asset

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

Profitability ratio

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

Profitability ratio = net income/total asset

Hypothesis H3: Profitability Ratio has negative and significant effect on lending interest rate.

Operating cost

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

Thus, operating expense to total assets ratios is the determinant factor in lending rates (Bawumia et al.2005), (Bhattarai,2015) ,and (Mbao et al.2014). They found that operating costs has positive effect on lending interest rates. Operating inefficiency had positive

influence on lending rates. It implies that increasing the level of inefficiency tends to increase cost. In line with theory and past empirical evidence, an increase in operating costs is expected to have positive influence on lending interest rate.

Operating cost ratio = Operating Expenses /Total Assets

Hypothesis H4: Operating cost to total assets ratio has positive and significant effect on lending interest rate.

Non-interest income

Non-interest income is reflecting product diversification refers to all the income of commercial banks other than the interest income. This is a service charge obtained by commercial banks from fiduciary revenue, service charges, trading revenue and fees and other income Stiroch (2002).

The product diversification measured by the non-interest income variable (the income share of commission and fee income) has a significant negative coefficient on loan pricing of Indian banks suggesting possible cross-subsidization of traditional lending activities. Thus, banks decrease their lending rate when they are more reliant on fee generating product Ansari (2015). There is negative relationship is expected between lending interest rate and non-interest income.

Non-interest income = Non-interest income/operating income

Hypothesis H5: Non-interest income to operating income has negative and significant effect on lending interest rate.

Exchange Rate

Exchange Rate is the number of units of a given currency that can be purchased for one unit of another country's currency. When the value of domestic currency against foreign currency decreases, it has a positive impact on export of the country. Exchange rate is considered as a price upon which economic agents rely in making economic decisions about resource allocation. This helps to boost up the export of the country and import become expensive and vice versa. Countries have different policies concerning their currency exchange rate. In the floating exchange rate system, the currency's foreign exchange rate is allowed to fluctuate freely by supply and demand for the currency (Fabozzi, 2009). Commercial bank loan and advances increases, annual average exchange of naira

to dollars also increases and vice versa. There is a positive relationship expected between lending interest rate and exchange rate in this research. To proxy Exchange rate annual average exchange rate of the birr to US dollar was used.

Hypothesis H6: annual exchange rate has positive and significant effect on lending interest rate.

Inflation rate

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

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

Bank liquidity Ratio

Liquidity ratio is measured as a ratio of liquid assets to total assets. Liquid assets refer to cash and deposit balances in banks including the reserve requirement in the National bank (Kuiptu 2014). Liquidity risk is the risk that a bank is not able to meet up or fulfill its short-term debt obligation or its short-term financial needs effectively and on time (Samad, 2004). Banks are normally faced with this risk when they are unable to convert a security or an illiquid asset to cash without a substantial loss of income or capital. Liquidity is considered to be the life and blood of commercial banks. Examples of liquidity risks banks usually faced are funding and time risk. According to Emeri, (2016), banks can measure their liquidity risk using any of the following ratios; a loans/total asset, purchase funds/total assets, loans/core deposits. In this study liquidity measurement used is liquid asset/total assets. Banks' are

usually faced with liquidity risk and are unwilling to give out loans when they are unable to convert an illiquid asset to cash without a substantial loss of capital. Loutschina (2011) and Emeri (2016) exhibited a negative relationship between liquidity and lending and it was significant. Thus, a negative relationship is expected between liquidity and bank lending rate decision or behavior.

Hypothesis H8: Liquidity ratio has negative and significant effect on lending interest rate.

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

According to, Gujarati (2009) has asserted that as a formal test, Hausman test can be used to decide between fixed effect models (FEM) and random effect model (REM) for panel data analysis. According to Gujarati (2009), the null hypothesis underlying the Housman test is that the FEM and REM estimators do not differ substantially. Further, Gujarati (2009), if T (the number of time series data) is large and N (the number of cross-sectional units) is small, there is likely to be little difference in the values of the parameters estimated by fixed effect model (FEM) and random effect model (REM). Hence the choice here is based on computational convenience. On this score, REM may be preferable. Since the number of time series (i.e. 8 year) is greater than the number of cross-sectional units (i.e. 9 commercial banks), FEM is preferable in this case. According to Brooks (2014) and Wooldridge (2013), it is often said that the REM is more appropriate when the entities in the sample can be thought of as having been randomly selected from the population, but a FEM is more plausible when the entities in the sample effectively constitute the entire population/sample frame. Hence, the sample for this study was not selected randomly and equals to the sample frame REM is appropriate.

3.8. Model Specification

Thus in respect of the hypotheses stated above, the main issue is an investigation of relationship that exists between the lending rate of commercial banks and each of explanatory variables that had been identified through literature and theories i.e. Deposit rate, operating cost total asset , liquidity ratio, profitability ratio, bank size of banks, exchange rate, non-interest income and inflation. Other factors that are not explicitly included in the model were captured by the error term in the mode. The nature of data that was used in this study enabled to use panel/longitudinal data model which comprises of both cross-sectional elements and time-series elements; the cross-sectional element is reflected by the different Ethiopian private commercial banks and the time-series element is reflected in the period of study

(2015-2022). The advantage of panel data in question is because it contains more information; it incorporates variability among cross section units and time (Gujarati, 2004).

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

According to Brooks (2014), it is very easy to generalize the simple model to one with k repressors" (independent variables). $Y_i = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + \dots + \beta_k x_{ki} + \epsilon_i$, $i = (1, 2 \dots i)$. So, Where Y_i is the i th observation of the dependent variable, $X_{1i}, \dots, X_{ki}$ are the i th observation of the independent variables, β_0 is the constant term, $\beta_1 \dots \beta_k$ are the coefficient of the independent variables of the study, ϵ_i is the i th observation of the stochastic error term. Accordingly, to test the banks determinant factors on lending interest rate, the researcher estimated a linear regression model in the following form.

$$LIR = \beta_o + \beta DR_{it} + \beta BS_{it} + \beta PR_{it} + \beta OC_{it} + \beta NII_{it} + \beta ER_{it} + \beta LIQ_{it} + \beta IF_{it} + \epsilon_{it}$$

Where, LIR = lending interest rate of i^{th} bank in year t

DR= deposit rate of i^{th} bank in year t

BS = bank size of i^{th} bank in year t

PR = profitability ratio of i^{th} bank in year t

OC = operating cost to total asset ratio of i^{th} bank in year t

NII = non-interest rate of i^{th} bank in year t

ER = exchange rate of i^{th} bank in year t

LIQ = liquidity ratio of i^{th} bank in year t

IF = inflation rate of i^{th} bank in year

ϵ = error term

β_o = intercept(constant)

i = number of observation and t = time period, $t = 1 \dots 8$ i^{th} bank in year t

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

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

H0: the model is correctly specified

H1: the model is not correctly specified

$$\alpha = 0.05$$

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

3.9. Ethical Consideration

Initially the researcher has considered ethical issues that was anticipated and described in this thesis and related to all the phases of the study. Mainly the research outcome helps the banks under the study and it were sources of information for others. Moreover, the researcher tries not falsifying or distorts data or the methods of data collection or plagiarizes the work of other. Finally, followed the best preparation for ethical behaviors like internalize sensitivity to ethical concerns and adopt a serious professional role.

Table; 3.1 Description of the variables and their expected relationship

Variables	Symbol	Measurement	Expected sign	source
Dependent variable				
Lending interest rate	LIR	Interest income/Loans and advances	NA	Bonga, 2016; Obillo, 2015; Wellington, 2016; Mwanga, 2014; Onyango, 2013).
Independent variables				
Deposit rate	DR	Interest expense \ interest bearing deposit	Positive	Cihak(2004),Bhattarai,(2015) and Kaymaz and Kaymaz (2011)
Bank size	BS	Natural log of total asset	Negative	Uchida et al., 2007, Obamuyi, (2013), Bashiri (2003)
Profitability ratio	PR	net income/total asset	Negative	Windmeijer (2005)
Operating cost	OC	OperatingExpenses /Total Assets	Positive	Samual (2018) Gembacorta (2008),Obillo (2015),Mbao et al. (2014)
Non-interest income	NII	Non-interest income/Operating	Negative	Stiroch (2002) and Ansari(2015)
Exchange rate	ER	Annual average exchange rate	Positive	Fabozzi, (2009).
Inflation rate	IR	averageannual inflation rate	Positive	Adoah (2015), Boydand Champ (2004), Aboagye et al.(2005
Liquidity ratio	LIQ	liquid assets/total assets	Negative	Ngata&Njeru (2015)
Liquidity ratio	LIQ	liquid assets/total assets	Negative	Ngata&Njeru (2015)

Source: Developed by the researcher

CHAPTER FOUR

4. DATA ANALYSIS AND PRESENTATION

In this chapter, the data and its analysis results such as correlation and regression analysis findings were discussed. The chapter has five sections. The first section (section 4.1.) presents the descriptive statistics of the dependent and independent variables. This was followed by section 4.2 that presents results of the correlation analysis. Section 4.3 presents the test for the validity of assumptions for classical linear regression model/CLRM. Section 4.4 discussions for model specification section 4.5 discussions for model selection then, the results of the regression analysis were presented under section 4.6. Finally, discussions of the results of the regression Analyses and Hypotheses Testing were under section 4.7

4.1. Summary of Descriptive Statistics

As clearly mentioned in the earlier chapter, in this study descriptive statistics used to determine minimum, maximum, mean and standard deviation. The following table 4.1 provides a summary of the descriptive statistics of the dependent and independent variables for eight Ethiopian private commercial banks for the period of 8 years from year 2015-2022 with a total of 72 observations. This was generated to give an overall description of data used in the model. The dependent variable used in this study was lending interest rate (LIR) and the independent variables are deposit rate (DR), bank size (BS), profitability ratio (PR), operating cost (OC), non-interest income (NII), exchange rate (ER), inflation rate (IR) and liquidity ratio.

Table 4.1 summary of descriptive statistics of variable over the study period

	Variables	observation	Mean	Standard deviation	Minimum	Maximum
<i>Dependent</i>	Lending interest rate	72	0.1364	0.0164	0.098	0.183
<i>independent</i>	deposit rate	72	0.1177	0.1829	0.033	0.0818
	bank size	72	14.9433	3.545665	2.0102	2.9458
	Profitability ratio	72	0.0514	0.0722	0.0105	0.323
	Operating cost	72	0.0558	0.0711	9.492	19.0271
	Non-interest income	72	0.2798	0.1006	0.006	0.476
	Exchange rate	72	0.0523	0.0343	0.0123	0.1535
	Inflation rate	72	0.0343	0.0293	0.0294	0.075
	Liquidity ratio	72	0.1946	0.0756	0.0090	0.5634

Source: own Computation from sampled audited financial statement and NBE via stata

From the above Computed table the lending interest rate (LIR) of private commercial banks, which is the dependent variable ranged between maximum values of 18.30% and a minimum value of 9.8%, with the mean of 13.64%. This indicates that Ethiopian private commercial banks charge annual average lending rate of 13.64% on their loans. The mean ratio is by far, more due to there is no current minimum regulatory requirement of lending interest rate standard. In Ethiopia NBE Directives No. NBE/INT/12/2017 stated that any licensed commercial banks in Ethiopia can determine lending interest rate themselves. The implication of this descriptive result is there is noticeable increment of lending interest rate from period to period regarded to their internal policy. The standard deviation statistics for lending interest rate was (0.0164) or 1.64% which implies the presence of high variations among the interest rate of loan and advance across private commercial banks' included for this study.

The deposit rate, which is the independent variable with mean value of 11.77% showing standard deviation of 18.29% from the mean value. The minimum value of deposit rate was 3.3% and the maximum value of deposit rate was 8.18%, This indicates the deposit rates of private commercial banks is relatively large as compared to minimum interest rate of 7% put by national bank of Ethiopia under interest rate directive No. NBE/INT/12/2017 this leads to attract customer for deposit.

As refer to the above table among the independent variables bank Size was highly dispersed from its mean value of 14.94 which is the average total asset size of sampled commercial banks in Ethiopia during the study period with the standard deviation of 3.545665. The maximum and minimum values were 4.197 and 0.574 respectively. This shows that large size bank has the advantage of providing a large menu of financial service to their customers and thereby mobilizes more funds which will lead to serving their customers at nearly. The maximum value indicating the large private commercial bank in Ethiopia and the minimum value was some of small privately commercial banks in Ethiopia.

The profitability, which is the independent variable with the mean value of 5.14% showing standard deviation of 0.722% from the mean value. The standard deviation indicates there is substantial variation of profitability in selected Private commercial Banks' during sample periods. The minimum value of profitability, was 1.05% and the maximum value of profitability was 32.3%. This indicates that there is relatively moderate profitability ratio of private commercial banks in Ethiopia during the study period.

As it is seen in the above table 3.1 the operating cost which is the independent variable with the mean value of 5.58% showing standard deviation of 7.11% from the mean value.

The minimum value of operating cost was 3.34% and the maximum operating cost incurred during study period was 54.1%. This indicates that the operating cost of private commercial banks not very high but not small.

The non-interest income which is one of independent variable with mean value of 27.98% showing standard deviation of 10.06% from the mean value. The minimum value of non-interest income was 0.06% and the maximum value of non-interest income was 47.6%. This indicates banks with high non-interest income provide more loans to their customer with low lending interest rate.

The exchange rate, which is the independent variable with mean value of 5.23% showing standard deviation of 3.43% from the mean value. The minimum value of exchange rate was 1.23% and the maximum value of exchange rate was 15.35%. This indicates that as the exchange rate increase their lending interest rate also rises.

Based on the result of table 3.1 the general increase of inflation rate 3.03% of the country per year on average over the past eight years was more. The maximum inflation was recorded in the year 7.5% which is greater than average lending rate of 13.64% and the minimum was recorded in the year -0.294%. This indicates that inflation rate increase lead the banks to increase in lending interest rate. The rate of inflation was highly over the periods under study towards its mean with standard deviation of 8.66 which indicating highly variation between the selected banks during sample period.

The mean value of liquidity (total liquid asset to total customer deposit) of Ethiopian commercial Banks for a given period was 19.46. The mean ratio is by far, more than above the current minimum regulatory requirement of 15%. NBE Directives No.SBB/57/2014 any licensed commercial banks in Ethiopia required to maintain not less than liquid asset of 15% of its net current liabilities. The maximum and minimum value of liquidity ratio is 56.34% and 0.09% respectively. There is high variation of maximum and minimum liquidity ratio. However the variation further indicated by standard deviation which is 7.56%.

4.2. Correlation Analysis among Variables

Table 4.2: Correlation Analysis

	LIR	DR	BS	PR	OC	NII	ER	IR	LIQ
LIR	1.0000								
DR	0.4200	1.000							
BS	0.2398	0.2049	1.000						
PR	-0.0142	0.3764	0.2291	1.000					
OC	-0.1521	-0.0474	-0.0334	-0.0634	1.0000				
NII	-0.4360	-0.4284	-0.3260	-0.0817	0.0697	1.0000			
ER	-0.0456	-0.5809	0.2013	0.0259	-0.0720	-0.2212	1.0000		
IR	-0.0310	-0.3160	0.6343	0.2183	-0.1413	-0.3827	0.5772	1.0000	
LIQ	-0.0505	-0.2406	0.0056	0.1013	0.1035	0.4239	-0.0986	-0.1189	1.0000

Source: NBE, Banks annual report and computed through stata Application

Correlation measures the degree of linear association between variables. Values of the correlation coefficient are always ranged between +1 and -1. Correlation coefficient of +1 indicates that the existence of a perfect positive association between the two variables, while a correlation -1 indicates perfect negative association. A correlation coefficient of zero, on the other hand, indicates the absence of relationship between two variables (Brook, 2014).

The sample size is the key element to determine whether or not the correlation coefficient is different from zero/statistically significant. As a sample size approaches to 100, the correlation coefficient of about or above 0.20 is significant at 5% level of significance (Meyers et al. 2006). The sample size of the study was 8*9 matrixes of 72 observations which was around 100 hence the study used the above justification for significance of the correlation coefficient. Table 4.2 shows the correlation coefficient between the dependent variables and independent variables. The correlation between the dependent and independent variables are discussed below;

As it is seen from the above Table 4.2 the deposit rate was positively correlated with lending rate, indicated by the correlation coefficient of 0.4200 between deposit rate and lending interest rate. This indicates that, when the deposit rate increases, lending rate moves to the same direction and the effect of deposit rate on lending rate statistically significant and positive. This was same with the expectation. Bank size has positively correlated with lending rate. The correlation coefficient for this variable was 0.2398, indicating that when the bank size increases, lending rate moves to the same direction and the result was statistically significant. On the other hand the correlation coefficient between profitability and lending interest rate is -0.0142 it means that there was negatively correlation between profitability and lending interest rate of commercial banks and the effect of profitability on lending rate

statistically insignificant and negative. Similarly correlation coefficient of operational cost and non-interest income is negatively correlated with lending interest rate of commercial banks a correlation of -0.1521 and -0.4368 respectively in the given study period. This indicates that as of operational cost and non-interest income increase lending interest rate of commercial banks moves to the opposite direction and become decrease. On the same way, the macro economic variables used in this study, exchange rate and inflation rate had negatively significant correlation with lending rate with a correlation of -0.0456 and -0.031 respectively. As indicating that, when the inflation rate increases, lending rate moves in the opposite direction. The result of the variable is statistically significant. Lastly the liquidity ratio was negatively correlated with lending rate correlation of -0.0505. This indicates when the liquidity increases, lending rate moves to the reverse direction but the result of the variable is statistically significant.

As per the result of table 4.2 the researcher has conclude that the correlation of deposit rate and bank size has positively correlated with lending interest rate of private commercial bank and the correlation coefficient of profitability ratio, exchange rate, inflation and liquidity ratio, operational cost and non-interest income is negatively correlated with lending interest rate of commercial banks.

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

The classical linear regression model assumptions hold true, then the estimators determined by ordinary least square (OLS) will have a number of desirable properties which is known as Best Linear Unbiased Estimators (BLUE) (Brooks, 2008). In this study as mentioned in chapter three diagnostic tests were carried out to ensure that the data fits the basic assumptions of classical linear regression model. Hence, the following sections discuss about the result of diagnostic test including, Multi-collinearity, Heteroskedasticity, normality, autocorrelation, unit root test, model specification test and model selection to ensure whether the data fits the basic assumptions of classical linear regression model or not.

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

According to Brooks (2014), if a constant term is included in the regression equation, this assumption will never be violated.

$$LIR = \beta_0 + \beta DRit + \beta BSit + \beta PRit + \beta OCit + \beta NIIit + \beta ERit + \beta IFit + \beta LIQit + \epsilon it$$

Therefore, since the constant term was included in regression equation this assumption will not be violated.

4.3.2. Test for Heteroskedasticity

Homoscedastic error term is one of the classical assumptions required for the OLS estimator to be efficient. The homoscedastic assumption fulfilled when the variance of disturbance term is constant and the same for all observation. If the disturbance terms do not have a constant variance across all observations the assumption of Homoscedastic will be violated. The violation of this assumption said to be Heteroskedasticity. If the problem of Heteroskedasticity exists in the model, the least squares estimators are still unbiased (consistent) however the Gauss- Markov theorem was violated, in other words confidence interval will be unnecessary larger. As result, the t-test and f-test gives Inaccurate result because of overestimation of variance, the t-test will be smaller and statistically insignificant which leads to wrong conclusion (Gujarati, D. N. & Porter, D. C., 2009). There are several tests present to detect the violation of this assumption. This study used Breusch-pagan test in order to check the presence of the problem of Heteroskedasticity for this model. The hypotheses for test of Heteroskedasticity were formulated as follows.

HO: There is homoscedasticity/constant variance/no Heteroskedasticity

H1: There is Heteroskedasticity.

Decision rule:

Reject Ho if p-value is less than the significant level ($\alpha = 5\%$). Otherwise, do not reject

Table 4.3Heteroskedasticity Test

Breusch-Pagan / Cook-Weisberg test for Heteroskedasticity	
Ho: Constant variance	
Variables: fitted values of LIR	
chi2(1)	0.53
Prob> chi2	0.4646

Source:Computed through Stata, NBE and Banks audited annual report from 2015-2022

As it is indicated in the above table 4.3 the probability value of chi2 is 0.4646or 46.46% which is higher than normal acceptance of significant level of 5%. Therefore, the null hypothesis of homoscedasticity is failed to reject at 5 percent level of significant. In other words, there is no Heteroskedasticity in this research model, so we can run OLS to this research model.

In econometrics, an extremely common test for Heteroskedasticity is the White test, which is a statistical test that establishes whether the variance of errors in a regression model is constant, which is homoscedasticity. If no cross product terms are introduced in the white test procedure, then this is a test of pure Heteroskedasticity

Figure4.1. Test of Heteroskedasticity by White test

```
White's test for Ho: homoskedasticity
      against Ha: unrestricted heteroskedasticity

      chi2(44)      =      42.83
      Prob > chi2   =      0.5219
```

Cameron & Trivedi's decomposition of IM-test

Source	chi2	df	p
Heteroskedasticity	42.83	44	0.5219
Skewness	12.44	8	0.1325
Kurtosis	0.21	1	0.6439
Total	55.48	53	0.3813

Source: Computed through Stata, NBE and Banks audited annual report from 2015-2022

From the above figure under white test the probability value of chi2 is 52.19%, which is greater than 5% of significance level. This indicates that the null hypothesis fail to reject. In other words, there was no Heteroskedasticity in this research model. With respect to Skewness the probability value is 13.25% and the probability value of kurtosis is 64.39% which is greater than 5% of significance level. This implies that there is no significance evidence for the presence of Heteroskedasticity at 5% significance.

4.2.1. Multicoliniarity Test

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

which independent variables are affecting the dependent variable. As noted by (Gujarat, 2004) a serious problem for multi co-linearity is occurred if the correlation is above 0.8 or that is pair-wise or zero-order coefficient between independent variable is out of the recommended range of multi co-linearity, which is -0.8 or 0.8. While Hair (2006), argued that correlation coefficient below 0.9 may not cause serious multi co-linearity problem.

The standard statistical method for testing data for multi co-linearity is analyzing by variance inflation factor (VIF) and explanatory variables correlation coefficients. The benchmark for variance inflation factor (VIF) often given as 10. Thus, if variance inflation factor (VIF) of explanatory variable exceeds 10 indicates that there is the presence of multi co-linearity. If the variance inflation factor (VIF) of explanatory variable less than 10 indicates that, there is absence of multi co-linearity

Table 4.4 Multi-collinearity test by variance inflation factor

Variable	VIF	1/VIF
DR	1.54	0.649270
BS	1.89	0.528136
PR	1.30	0.769119
OC	1.04	0.963795
NII	1.61	0.622818
ER	1.68	0.593834
IR	2.77	0.360410
LIQ	1.31	0.761010
Mean VIF	1.64	

Source: Computed through Stata, NBE and Banks audited annual report from 2015-2022

From the above table 4.4, the variance inflation factor (VIF) of all independent variables are less than 10. This showed that there is no Multicollinearity problem between explanatory variables.

4.2.2. Normality Test

A normal distribution is not skewed and is defined to have a coefficient of kurtosis of 3. A distribution said to be normal when it is symmetric about its mean and also called mesokurtic, while a skewed distribution is not symmetric to its mean, it may be skewed to the left or right side of its mean. For this research to check the problem of normality test, the researcher has been conducted using the most popular test of normality, Shapiro-Wilk W test for normal data. Based on this test of Normality, if the P value is more than 0.05 ($P \geq 0.05$) there is no normality problem.

Shapiro-wilk W test for normal data

Table 4.5 Test of normality

Variable	Observation	W	V	Z	Prob>z
Res	72	0.97398	1.639	1.076	0.14095

Source: Computed through Stata, NBE and Banks audited annual report from 2015-2022

The hypothesis for normality test was formulated as follows

Ho: Error term is normally distributed

H1: Error term is not normally distributed

Decision rule: reject Ho if p-value of Shapiro-Wilk W is less than the significant level ($\alpha = 5\%$). Otherwise, do not reject Ho.

Therefore, the normality tests for this study as shown in table 4.5, above, the Shapiro-Wilk W test for normal data has a P-value of 0.14095 implies that the p-value of the Shapiro-Wilk W test for normal data for the models is greater than 0.05 which indicates that the errors are normally distributed. From the above table the probability value of normality test is 14.095% which is greater than 5% significant level that shows we fail to reject the null hypothesis.

4.2.3. Test for Autocorrelation

It is assumed that the error terms are uncorrelated with one another. If the errors are not uncorrelated (correlated) with one another, it would be stated that they are “autocorrelated” or that they are “serially correlated”. The consequences of ignoring autocorrelation when it is present are similar to those of ignoring heteroskedasticity. The coefficient estimates derived by using OLS are still unbiased, but they are inefficient, meaning that the standard errors are biased. Another assumption of the classical linear regression model is that the covariance between the error terms over the time or cross-sectional is zero. In other terms, it is assumed that the errors are uncorrelated with one another. In this regard to test this assumption, the Wooldridge test for autocorrelation in panel data serial correlation test was used. The hypothesis for test of autocorrelation was formulated as follows.

HO: There is no autocorrelation

H1: There is autocorrelation

Table 4.6 Test for Autocorrelation

Wooldridge test for autocorrelation in panel data	
H0: no first order autocorrelation	
F(1, 9) =	4.827
Prob> F	0.0556

Source: Computed through Stata, NBE and Banks audited annual report from 2015-2022

Decision rule:

Reject H_0 if p-value is less than the significant level ($\alpha = 5\%$). Otherwise,

Do not reject H_0 .

From the above table 4.6, under Wooldridge test for autocorrelation the probability value of F is 5.56 % which is greater than 5% significance level. This depicts that we fail to reject the null hypothesis. This means that there is no significance evidence for the presence of autocorrelation at 5% significance level in this research model.

4.3. Model Specification test

Model specification is one of classical linear regression model (CLRM) that the regression model used in the analysis should be correctly specified. If the model is not specified correctly, we encounter the problem of model specification error or model misspecification. Model specification error occurs when omitting an important independent variable, or including unnecessary variable or choosing wrong functional form. If the omitting variable is correlated with the variable which included, the estimators will be biased and inconsistent and model specification error will tends to occur as noted by(Gujarat, 2004). To test this assumption, Ramsey RESET test was used. The hypotheses for model specification test were formulated as follows.

Table 4.7. Test for Model Specification: Ramsey RESET Tests

Ramsey RESET test using powers of the fitted values of lir	
Ho: model has no omitted variables	
F(3, 60)	1.26
Prob> F	0.2971

Source: Computed through Stata, NBE and Banks audited annual report from 2018-2022

The hypotheses for model specification test were formulated as follows.

HO: There is no omitting variable or model specification is correct

H1: There is omitting variable or model specification is incorrect

Decision rule: reject H_0 if p-value is less than the significant level ($\alpha = 5\%$). Otherwise, do not reject H_0

As it is shown in the above table 4.7, the Ramsey RESET test F-statistics is 1.26 with p-value of 0.2971 which is greater than 5% significant level, so failed to reject the null at 5% significant. Therefore, it depicts that this model is correctly specified and the estimated coefficients are appropriate to explain the lending interest rate factors.

4.4. Random Effect vs. Fixed Effect Models

According to (Brooks, 2008), there are broadly two classes of panel estimators' approach models that can be applied in financial research that is fixed effect model and random effect models. Choosing one of the two models depends on the assumption we make about the likely correlation between the cross-sections specification error and explanatory variable are uncorrelated. Hausman test is used to choose appropriate model for the study. The hypotheses for model selection were formulated as follows.

HO: random effect model is appropriate

H1: fixed effect model is appropriate

Decision rule: reject Ho if p-value is less than the significant level ($\alpha = 5\%$). Otherwise do not reject Ho.

Figure 4.2 Random Effect result By OLS

	Coefficients			
	(b) fe	(B) re	(b-B) Difference	$\sqrt{\text{diag}(V_b - V_B)}$ S.E.
dr	.8108873	.9631994	-.152312	.2267826
bs	-.0069168	-.0081712	.0012544	.00433
pr	.480483	.4957989	-.0153159	.0854914
oc	.166668	.2046686	-.0380006	.0973886
nii	-.0770647	-.0785937	.001529	.0118715
er	.0016029	.0015394	.0000635	.0008391
ir	.0013248	.000882	.0004428	.0040889

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

Test: Ho: difference in coefficients not systematic

$\chi^2(7) = (b-B)'[(V_b - V_B)^{-1}](b-B)$
= 2.31
Prob>chi2 = 0.9408

Source: Computed through Stata, NBE and Banks audited annual report from 2018-2022

The p-value for the Hausman test provided p-value which is 0.9408 or 94.08% is greater than 5% indicates that the null hypothesis was not rejected. Accordingly, random effect model (REM) was employed to estimate the relationship between the dependent and the independent variable

Therefore, Random effect model is appropriate for this study and regression analysis will be made based on random effect estimates.

4.2.1. Regression analysis and Interpretation

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

$$LIR = \beta_0 + \beta DR_{it} + \beta BS_{it} + \beta PR_{it} + \beta OC_{it} + \beta NII_{it} + \beta ER_{it} + \beta LIQ_{it} + \beta IF_{it} + \epsilon_{it}$$

Where, LIR = lending interest rate of i^{th} bank in year t

DR= deposit rate of i^{th} bank in year t

BS = bank size of i^{th} bank in year t

PR = profitability ratio of i^{th} bank in year t

OC = operating cost to total asset ratio of i^{th} bank in year t

NII = non-interest rate of i^{th} bank in year t

ER = exchange rate of i^{th} bank in year t

LIQ = liquidity ratio of i^{th} bank in year t

IF = inflation rate of i^{th} bank in year

ϵ = error term

β_0 = intercept(constant)

i = number of observation and t = time period, t = 1.....8 i^{th} bank in year t

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

Figure 4.3. Regression result By OLS

Source	SS	df	MS	Number of obs	=	72
Model	.009793391	8	.001224174	F(8, 63)	=	8.14
Residual	.009472554	63	.000150358	Prob > F	=	0.0000
				R-squared	=	0.5083
				Adj R-squared	=	0.4459
Total	.019265944	71	.000271351	Root MSE	=	.01226

LIR	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
DR	.0420755	.0098695	4.26	0.000	.0223529	.0617982
BS	.0222205	.0069444	3.20	0.002	.0083432	.0360978
PR	-.0533766	.02297	-2.32	0.023	-.0992784	-.0074748
OC	-.0464298	.0208405	-2.23	0.029	-.0880761	-.0047834
NII	-.066874	.0183236	-3.65	0.001	-.1034907	-.0302573
ER	-.0179447	.0549739	-0.33	0.745	-.1278012	.0919119
IR	-.2815169	.0808924	-3.48	0.001	-.4431675	-.1198663
LIQ	.0463272	.0220523	2.10	0.040	.0022592	.0903952
_cons	.0981692	.018815	5.22	0.000	.0605705	.135768

Source: Computed through Stata, NBE and Banks audited annual report from 2015-2022

The above figure 4.3 depicts effect of independent variables on commercial banks' lending interest rate. Thus lending interest rate is the dependent variable while deposit rate, bank size, Profitability, Operational cost, non-interest income, Gross exchange rate, inflation and liquidity are independent variables.

Multiple regression analysis was conducted to establish the relationship between commercial banks liquidity and the independent variables. The OLS model equation which is applied in this thesis is as follows:

$$\text{LIR} = 0.9816 + 0.4207\text{DR} + 0.0222\text{BS} - 0.0533\text{PR} - 0.0464\text{OC} - 0.06687\text{NII} - 0.01794\text{ER} - 0.2815\text{IR} - 0.0463\text{LIQ} + \text{Eit}$$

4.3.3. Interpretation of F- Statistic/variance Test/Model fit test

According to the above figure 4.3, the overall, F-statistic 8.14 which is highly significant at 1% with a p-value 0.000 revealed that, those independent variables collectively have statistically significant effect on the dependent variable. Thus, it implies that the explanatory variables in the model can describe the variations in the dependent variable, in which the total model is significant and we can use these data for prediction, policy making and educational purpose.

4.3.4. Interpretation of Coefficient of Determination(R- squared)

The coefficient of determination measures the success of the regression in predicting the values of dependent variable in the sample. It is the contribution of the independent variables to dependent variable. As noted by Muijs (2004), there is a rule of thumb, which can be used to determine the R – squared values as follows: 0% to 10% poor fit, 11% to 30% weak fit, 31% to 50 % moderate fit, and greater than 50% strong fit. The result of regression in the above figure shows, R^2 is 50.83%, meaning that 50.83%, variation of the dependent variable is explained by the selected independent variables. In other words ($100\% - 50.83\% = 49.17\%$) change in the dependent variable is due to unknown variables or error variables. It means that explained variance is more than error variance, which is good sign for developing the model.

4.3.5. Interpretation of Adjusted R – Squared

The adjusted R – squared tells that whether the additional independent variable contributed to the total model or not. Only when the additional term enhances the model more than would be predicted by chance does the modified R^2 rise. It falls off when a predictor boosts the model by less than would be predicted by chance. Here in this study adjusted R^2 of 44.59% indicates that the formula slightly fit for predicting the dependent variable lending interest rate. These means that 44.59% of changes occur in the dependent variable lending interest rate are attributable by the explanatory variable.

4.3.6. Interpretation of Regression Result

In this section, the relationship between dependent variable and each explanatory variable on the basis of findings were explained. The study includes the dependent variable which is lending interest rate and the independent variables, deposit rate, bank size, Profitability, Operational cost, non-interest income, Gross exchange rate, inflation and liquidity.

4.3.7. Interpretation of Intercept (Constant)

The constant is often defined as the value of the dependent variable when you set all of the explanatory variables in the model to zero. Here, from the above figure the value of intercept is 0.9816 and probability value of 0.000 that is significant even at 1%. This indicates that when all value of the independent variable is equal to zero the dependent value is equal to 0.9816.

4.4. Hypotheses testing and Interpretation of regression result

4.4.1. Deposit rate

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

Figure 4.3 the regression result shows that coefficient of deposit rate (DR) has positive and statistically significant effect on lending rate of private commercial bank by a coefficient estimate of 0.0420755 and its P-value is 0.0001. This means that holding other independent variables constant, when deposit interest rate increased by one percent, as the result the lending rate will increase by 4.20% on average, the effect is statistically significant even at 1% significant level. Accordingly, the result supported the working hypotheses that deposit interest rate has positive and statistically significant effect on lending interest rate of private commercial banks in Ethiopia for the period of 2015 to 2022. It was in line with the hypotheses (1). This result is consistent with Cihak (2004), Bhattarai, (2015) and Kaymaz and Kaymaz (2011), they found significant positive relationship with lending interest rates. But inconsistent with Samuel and Peters (2014) and Ali et al. (2016). They found that deposit rate has a significant and negatively relationship with lending rate. The deposit rate, as a cost of the basic sources of financing of bank activities, is found statistically significant in models used in the study. Moreover, the sign of deposit rate conform to the expectation and this showed that as the private Commercial bank deposit rate increases definitely increase their lending rate in the bank. The result is in line with economic theory of Loanable Funds Theory which premises a positive relationship between the bank lending interest rate and deposit interest rate as creditors pass out their input cost of funds to borrowers. Loanable funds theory explains factors that influence lending rates in that if individuals do not save in banks due to low interest rates offered on deposits due to poor financial intermediation as a result of inefficiencies in banking, there will be low deposits from which banks will lend from and thus high lending rates.

4.4.2. Bank Size

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

According to the above Figure 4.3 regression result, bank size has positive relationship with the dependent variable and it is statically significant even 1% confidence level. This regression result is not in line with the research hypothesis which has been formulated

bank size has negative and significant impact on lending rate. The result shows that larger bank size tend to change high lending rate compared to smaller size. The evidence here suggests that large banks do not benefit from the scale of economies which will result in lower cost and lead to lower lending rate. Banks may be suffering from diseconomies of scale which have contributed to the high cost and lending rate. Generally large bank size charge high lending rate to compensate for their involvement in technology and branch opening cost as well as network expansion. In response to to model specification bank size was peroxide by the natural logarithm of assets. This finding is inconsistent with theories that are emphasizing the importance of economics of scale effect. Due to increased economics of scale, bank that maintain sufficient asset should benefit from their size and have lower lending rates. However to extent that those bank sizes indicate control of the market in the loan markets, positive relationship between interest rate and bank size should not be surprised.

The estimated coefficient 0.0222205 with p value of 0.002 of Bank size on regression was interpreted as holding other variables constant, average increase of Bank size in one unite cause 0.0222205 increases in banks' lending interest rate of commercial banks in Ethiopia passed to borrowers by setting higher loan rates and the relationship is statistically significant at 5% significant level.

4.4.3. Profitability Ratio

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

Regarding to figure 4.3, the regression result shows bank Profitability ratio (PR) is negatively and statistically significant impact on lending interest rate of private commercial banks in Ethiopia since its P-value is 0.023 and coefficient is (-0.0533766). This means that holding other independent variables constant, when bank Profitability ratio increased by one percent, the lending rate will decreases by 5.33% on average, the relationship is statistically significant at 5% significant level. Accordingly, the result supported the working hypothesis that bank Profitability ratio has negative and statistically significant effect on lending interest rate of private commercial banks in Ethiopia for the period of 2015 to 2022. Meaning that bank Profitability ratio has statistically significant effect on lending rates of private commercial banks in Ethiopia. The result indicates that profitable private commercial banks have low lending rate in Ethiopia context. The result is inconsistent to Bhattarai (2015), Siddiqui (2012), Khan (2014), Obillo (2015). the result is in line with credit market theory

postulates that the borrowers willing to pay high interest rates may on average be worse risks; thus as the interest rate increases, the riskiness of those who borrow also increases, reducing the bank's profitability.

4.4.4. Operating cost

H4: Operating cost has positive and significant effect on lending interest rate of Private commercial banks in Ethiopia

The empirical finding the regression result of operating costs to total assets ratio is negative and statistically significant relationship between private commercial bank lending interest rate in Ethiopia. Since, its P-value is 0.029 and coefficient is (-0.0464298). This means that holding other independent variables constant, when operating costs to total assets ratio increased by one percent, the lending interest rate will decrease by 4.64% on average, the relationship is statistically significant even at 3% significant level and the result is not consistent with my expectation since its effect was statistically significant as well as negative relationship. Thus, we concluded that operational cost has a negative and statistically significant effect on Ethiopian commercial banks' lending interest rate for the period of 2015 to 2022. The result is inconsistent with Samuel (2018), Gambacorta (2008), Obillo (2015), Mbaio et al. (2014), Siddiqui (2012), Okoye and Ricahrd (2013) and Karanu and Ileri (2015) they found that operating costs to total assets ratio have a positive relationship with lending rate.

4.4.5. Non-interest income

H5: non-interest income has negative and significant effect on banks' lending interest rate.

Based on the result of figure 3, the non-interest income has negative and significant effect on lending interest rate of private commercial banks in Ethiopia. Hence, the non-interest income has the coefficient of -0.066874, and its probability value of 0.000 meaning that it is statistically significant at 5% significance level. This implies that holding other explanatory variable constant, when the non interest income increase by one percent (1%), as a result the lending interest rate of private commercial banks decrease by 6.68% and the effect is statically significant at even 1% significance level. This indicates that Banks with a better income diversification have the leverage to reduce lending interest rates and improve the efficiency of the financial system. The statically significant impact of non-interest income on lending interest rate is in line with hypotheses. This outcome is consistent with the study conducted by of Mbaio (2014), so that the result suggested that their negative significant relationship between non-interest income and the bank lending interest rate. Banks with

improved income tend to benefit borrowers by lowering interest rate.

4.4.6. Exchange rate

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

From the above figure 4.3, the exchange rate has negative and insignificant effect on lending interest rate of private commercial banks in Ethiopia. Exchange rate has the coefficient of -0.0179447 and its probability value of 0.745. Meaning that exchange rate has statistically insignificant effect on lending interest rates of private commercial banks in Ethiopia. The results indicate a negative relationship between lending rates and exchange rate and it is statistically insignificant even at 7%. The result suggests that the lending rate of private banks is not sensitive to inflationary pressure but to move in same direction. The findings are inconsistent with previous study with Carolyn C.Lagat and Daniel M. Nyandema (2016), so that the result suggested that there is a positive relationship between exchange rate and lending interest rate. It also may reflect how fluctuating and volatile exchange rate may have contributed to the growth of profitability and lending interest rate of banks.

4.4.7. Inflation

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

Inflation is persistent increase in price level in an economy. From theoretical stand point, there is positive relationship between inflation and lending interest rate i.e. high inflation rate generally associated with high interest rate. However, the regression result of this study has displayed negative relationship between lending interest rate and inflation. This indicates that the interest income of commercial banks in Ethiopia is negatively affected by inflation. The result is inconsistent with existing studies and not in line with theories and initially formulated hypothesis.

Perry, 1992 argue that the effect of inflation on bank interest rate depend on whether inflation is anticipated or unanticipated. If inflation is anticipated, then the bank adjust interest rate accordingly, herby increasing the interest rate margins. On the other hand if inflation is not anticipated then the bank may be slow in adjusting their interest rate and so may affect interest margin negatively because of increased cost occasion by inflation.

Some existing studies conducted on interest rate margin have found negative relationship between interest rate margin and inflation. abruce& Mendes,2002) found negative relationship

between interest rate margin and inflation on a cross-country study of Portugal, Spain, France and Germany (Maria & Agoraki, 2010) also found negative relationship between net interest rate margin and inflation on south eastern Europe countries. (Martinez & Mody, 2004) showed that inflation has a negative impact in Latin- American Bank margin. (Samy, 2003) indicated a negative relationship between inflation and interest margin of Tunisia banks.

In the Ethiopia commercial banks Inflation rate has an estimated coefficient -0.2815169 in the lending interest rate, which means that holding other independent variables constant, a One unit increase in Inflation rate cause reduction of lending interest rate by 0.2815169 and the relationship statistically significant even at 1% significant level. even though inflation brings higher cost and higher income, it seems that cost increases more than do revenue in the cause of Ethiopia commercial banks thus negative coefficient shows that inflation happening in Ethiopia is unanticipated that increases their cost doing business and erodes the real interest income which means in turn reduce lending interest rate.

4.4.8. Bank Liquidity Ratio

H8: Bank Liquidity Ratio has negative and significant effect on lending interest rate of Private commercial banks in Ethiopia

As it is seen in the above figure 3, the result of regression model displays the coefficient liquidity ratio (LR) is positive and statistically significant level, indicating higher lending interest rate for banks with a higher proportion of liquid asset. Even though the regression outcome is not accordance with hypothesis which has been hypothesized as has negative and significant effect on lending interest rate. The result is consistent with Ali et al. (2016), Cihak (2004), Adoa (2015) and Okoye and Ricahrd (2013), they found that liquidity ratio have a significant and positively relationship with lending rate since they need to be compensated for keeping more liquid assets i.e. when bank total asset increase, bank lending rate moves upwards.

Bank that either decide or required by regulation to hold a high proportion of their assets in the form of liquid assets seem to charge higher lending rates. This can be interpreted banks response to the fact that in holding higher liquid ratio, Banks forego a return on such assets or incur more opportunity costs which they pass to borrowers in the form of higher loan prices.

The liquidity peroxided by liquidity assets to total assets has an estimated coefficient of 0.0463272 with P-value is 0.040 in the lending rate regression, which means that holding other variables constant, average increase of liquidity ratio in one percent result in

4.63% increases in banks' lending interest rate passed on borrowers and the relationship is statistically significant at 5% significant level.

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

S.No	Explanatory variables	Expected sign and impact on lending interest rate	Actual impact on lending interest rate
1	DR	Positive and significant	Positive and significant
2	BS	Negative and significant	Positive and significant
3	PR	Negative and significant	Negative and significant
4	OC	Positive and significant	Negative and significant
5	NII	Negative and significant	Negative and significant
6	ER	Positive and significant	Negative and insignificant
7	IF	Positive and significant	Negative and significant
8	LIQ	Negative and significant	Positive and significant

Table 4.9 summary and comparison of regression result and hypothesis testing

S.No	Explanatory variables	Hypothesis	Regression P-value	Rejected/Accepted the hypothesis
1	DR	Positive and significant	0.000	Accepted
2	BS	Negative and significant	0.002	Accepted
3	PR	Negative and significant	0.023	Accepted
4	OC	Positive and significant	0.029	Accepted
5	NII	Negative and significant	0.001	Accepted
6	ER	Positive and significant	0.745	Rejected
7	IR	Positive and significant	0.001	Accepted
8	LIQ	Negative and significant	0.040	Accepted

Note: P-value is the probability value from the above regression table 4.10

CHAPTER FIVE

5. SUMMARY OF FINDING, CONCLUSION AND RECOMMENDATION

This chapter consists of the study of summary, conclusions, recommendations and an indication of future researches. Since the study deals about the factors that affects lending interest rate in Ethiopia Commercial banks during the period from 2015-2022 G.C. Findings indicated that Ethiopian commercial banks' lending interest rate are influenced by bank specific or internal factors including: bank deposit rate (DR) Bank size (BS), Profitability (PR), operational Cost (OC), Non-interest income (NII) Liquidity and external or macroeconomic factors including: Exchange rate (ER) and Inflation .This chapter outlines the summary and conclusions of the study in accordance with the regression results. It also gives an insight on the policy recommendations as well as suggestions for future studies.

1.1. Summary of finding of The Study

The broad objective of this study was to identify the main bank-specific, industry specific and macro-economic factors that can affect Ethiopian private commercial banks' lending interest rate and to what extent these determinants exert impact on Ethiopian Private commercial Banks' lending rate. In doing so, previous studies on lending interest rate have been reviewed and it is summarized that the lending interest rate of bank is usually expressed as a function of internal and external determinants. The internal determinants refers to the factors originate from bank accounts (balance sheets and/or profit and loss accounts) and external determinants are variables that are not related to bank management but reflect the economic and legal environment that affects the operation and performance of financial institutions. The broad objective of this study was to identify the main bank-specific, industry specific and macro-economic factors that can affect Ethiopian private commercial banks' lending interest rate and to what extent these determinants exert impact on Ethiopian Private commercial Banks' lending rate. The literatures differ about the category of factors that had the greatest influence on lending interest rate. Some of the studies argue that the main determinants of lending rate are bank specific factors; whereas others claim that the industry specific factor and macroeconomic factors are the most important variables that explain the level of lending interest rate. Therefore, there is a continuous debate on the key determinants of lending rate in different countries. Cognizant of the need for further research in the area, the current study had proposed a model based

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

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

1.2. Conclusion

The empirical result of this study showed that inflation rate, and profitability ratio had significant and negative effect on lending interest rate of private commercial banks in Ethiopia and Deposit rate and bank size and liquidity ratio had significant and positive impact on lending interest rate of private commercial banks in Ethiopia. Industry specific factor inflation has significant and negative effect on lending interest rate of Ethiopian private commercial banks. Exchange rate is also negative but insignificant impact on lending interest rate of private commercial banks in Ethiopia.

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

- Deposit rate revealed positive and statistically significant impact on lending interest rate of private commercial bank in Ethiopian. In other word, Deposit rate had the direct relationship with the lending interest rate of private commercial banks in Ethiopia. The sign of deposit rate conform to expectation and this showed that as the Commercial bank deposit rate increases will definitely increases their lending rate in the bank.
- Bank size revealed positive and statistically significant impact on lending interest rate of private commercial banks in Ethiopia. The large size bank has the advantage of providing a large menu of financial service to their customers and there by mobilize more funds which will lead to serving their customers with low lending rate. Bank size was a great determinant of lending rate of commercial banks as larger banks lacked the ability to offer lower lending rates as the interest spread maintained was lower compared to that of the smaller banks. Due to increased economies of scale, banks that maintain sufficient asset should benefit from their size and have lower lending interest rates.
- Bank Profitability ratio revealed negative and statistically significant impact on lending interest rate of private commercial banks in Ethiopia. Bank Profitability ratio indicator profitable banks have the capacity to implement modern Credit risk management system, technology and hiring trained man power/experts as well as having credit information access so that it contributes for low lending interest rates.
- Operating costs to total assets ratio is negative and statistically significant relationship between private commercial bank lending interest rate. This implies that Operating cost increases the cost of banking institution which then results into lower lending interest rates.
- Non-interest income has a negative and significant impact on lending interest rate of private commercial banks in Ethiopia even at 1% significance level.
- Inflation rate the coefficient of inflation was negative a statistically significant, but this negative relationship effect of inflation on Ethiopian private banks lending rate is not anticipated but the findings suggested that as inflation is a determinant of banks' lending rate in Ethiopia as far as the parameter for this variable is significant as illustrated by the large p-values of even at 1% significance level. In terms of inflation impact on lending rate, previous studies of Adoo (2015), Mbaoetal.(2014), Asamoah and Adu (2016), Kinyuru(2011), Ahmed (2016), Omondi (2014) and Gambacorta (2008) showed a positive result and this

implies that during the period of the study, inflation was anticipated which gave banks the opportunity to adjust the interest rates accordingly, resulting in revenues that increased faster than costs, with a positive impact on lending rate. Referring to previous studies, the results they found that inflation is positively related to lending rate. This suggests that lending interest rates change in proportion to the changing expected inflation.

- Bank liquidity ratio revealed positive and statistically significant impact on lending interest rate of private commercial banks in Ethiopia. When liquidity ratio increased by one percent, the lending interest rate will increase by 0.46% on average, the relationship is statistically significant at 5% significant level. When bank total asset increase, bank lending rate moves upwards and high return of highly liquid asset.

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

1.3. Recommendations

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

- The study recommends, that the selected variables are determinant factors of private commercial bank's lending interest rate such as bank specific factors deposit rate, bank size, liquidity ratio, profitability ratio and Operating cost, Non-interest income and macroeconomic factors Exchange rate and inflation rate to determine lending interest rate in private commercial bank at an acceptable level except Exchange rate. Based on the findings and conclusions above, the study recommends that commercial banks evaluate their lending rates properly to ensure that they have adequate loan disbursement but also high returns that would improve the financial performance. This therefore means that commercial banks need to clearly evaluate their lending rates and the costs attached to the finances so as to come up with optimal returns.
- The study also recommends, large size bank has the advantage of providing a large menu of financial services to their customers as result Banks should try as much as possible to a balance which will help them to cover cost associated with lending and at the same time, maintain good banking relationship with their borrowers. Bank management should maintain lending rate at carefully which is essential to the safety and soundness of banking institution. Moreover, bank management should ensure that

appropriate policies procedures, management information systems and internal controls to maintain lending rate at practical levels with consistency and continuity. This is Competitive advantage on economies of scale as the result large bank send loan to their customer with small landing rate.

- Interest paid on deposits by individual banks is a major factor in private banks. The higher the interest paid on these deposit the more the lending rate will be **and** the smaller the interest paid the lower the lending rate will be. When banks mobilize deposit from customers, they pay interest on these deposits (i.e. saving and fixed time deposits) to ensure that deposits do not lose value over the period that the money is kept with the bank. The interest on deposits which is termed as borrowing rate is expensive for time deposits than saving deposits. Thus, commercial banks should strategize on how to attract and retain more saving deposits rather than focusing on mobilization of fixed time deposits so as to reduce interest expense thereby further improve their lending rates.
- Regarding to non-interest income has a negative significant impact on lending interest rate of private commercial banks of Ethiopia. Following this, the researcher recommend that banks need to improve their operational efficiency by setting lower bank lending interest rate by using appropriate cost reduction strategies and banks focus on other income sources such as charge from mobile banking, internet banking, ATM, telegraphic transfers, insufficient funds fees, annual fees, transactions fees, issuance of guarantees, brokerage or commission earned on foreign transactions and financial advisory services.
- Private commercial banks should manage their liquidity position; from the regression result liquidity ratio and lending interest rate positive relationship in private commercial banks of Ethiopia. This implies that high liquidity ratio are likely to include the deposit of customers due to inefficiency leading to higher lending interest rate.
- Private commercial banks should manage their internal inefficiencies; from the regression result operating cost to total asset ratio and lending interest rate negative relationship in private commercial banks of Ethiopia. This implies that high operating costs are likely to include costs due to inefficiency leading to lower lending interest rate. The private commercial banks should give more attention in maintain cost efficiency by reducing controllable operating expenses using appropriate cost reduction strategies will help to bring bank loan price rise. This can be done by

moving towards multi-channel banking products such as mobile banking, internet banking, agent banking and effective utilization of Automatic Teller Machine by using those advanced technologies.

- Regarding to exchange rate since it has negative and insignificant on lending interest rate of private commercial banks of Ethiopia. Following this the researcher recommended that banks are not giving more focus on reduction uncontrolled exchange rate rather than this banks focus on diversifying the way to increasing foreign currency reserves
- As it is seen in the finding and conclusion Inflation has negative effect on bank lending interest rate and statistically significant so concerned bodies like national bank of Ethiopia and Ethiopian government should be all rounded inspection concerning financial institution activity and the country's economic condition by considering different aspects.
- As over all the researcher recommended to private commercial banks to incorporate fully the credit information they gather on their lending policies so as to ensure consumers with good credit ratings get competitive lending rate and don't suffer the effect of branded risky borrowers thus lacking credit or being charged high lending rates.

1.4. Suggestions for Future Research

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

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Appendix-1

bank	year	LIR	DR	BS	PR	OC	NII	ER	IR	LIQ
AB	2015	0.119	0.049	2.011	0.027	0.034	0.365	0.089	0.027	0.163

AB	2016	0.126	0.051	2.032	0.025	0.036	0.319	0.012	-0.029	0.196
AB	2017	0.116	0.052	2.065	0.024	0.035	0.313	0.013	0.041	0.229
AB	2018	0.135	0.069	2.391	0.027	0.035	0.207	0.043	0.032	0.208
AB	2019	0.128	0.080	2.418	0.033	0.034	0.349	0.015	0.020	0.091
AB	2020	0.140	0.079	2.907	0.029	0.038	0.430	0.060	0.046	0.205
AB	2021	0.115	0.079	2.927	0.026	0.040	0.310	0.094	0.065	0.215
AB	2022	0.115	0.081	2.946	0.290	0.043	0.310	0.076	0.075	0.217
DB	2015	0.125	0.044	2.314	0.029	0.036	0.438	0.089	0.027	0.223
DB	2016	0.122	0.052	2.328	0.082	0.044	0.443	0.012	-0.029	0.240
DB	2017	0.117	0.077	2.347	0.022	0.034	0.394	0.013	0.041	0.189
DB	2018	0.141	0.079	2.372	0.021	0.038	0.338	0.043	0.032	0.196
DB	2019	0.133	0.056	2.392	0.018	0.038	0.304	0.015	0.020	0.032
DB	2020	0.138	0.078	2.893	0.023	0.043	0.197	0.060	0.046	0.163
DB	2021	0.125	0.079	2.911	0.018	0.037	0.102	0.094	0.065	0.149
DB	2022	0.124	0.078	2.922	0.024	0.039	0.293	0.076	0.075	0.085
BOA	2015	0.144	0.043	2.339	0.021	0.034	0.293	0.089	0.027	0.316
BOA	2016	0.137	0.044	2.359	0.022	0.042	0.379	0.012	-0.029	0.184
BOA	2017	0.114	0.052	2.837	0.023	0.043	0.332	0.013	0.041	0.165
BOA	2018	0.153	0.058	2.850	0.018	0.042	0.249	0.043	0.032	0.174
BOA	2019	0.149	0.082	2.861	0.020	0.040	0.282	0.015	0.020	0.139
BOA	2020	0.132	0.084	2.882	0.014	0.047	0.145	0.060	0.046	0.134
BOA	2021	0.104	0.086	2.860	0.013	0.044	0.230	0.094	0.065	0.136
BOA	2022	0.128	0.082	2.880	0.220	0.048	0.141	0.076	0.075	0.151
WB	2015	0.141	0.509	2.324	0.026	0.043	0.356	0.089	0.027	0.178
WB	2016	0.136	0.052	2.332	0.023	0.044	0.332	0.012	-0.029	0.191
WB	2017	0.131	0.067	2.825	0.250	0.046	0.372	0.013	0.041	0.250
WB	2018	0.143	0.073	2.841	0.029	0.044	0.433	0.043	0.032	0.197
WB	2019	0.156	0.077	2.845	0.021	0.046	0.329	0.015	0.020	0.182
WB	2020	0.139	0.077	2.860	0.022	0.050	0.476	0.060	0.046	0.211

WB	2021	0.151	0.075	2.862	0.011	0.062	0.268	0.094	0.065	0.154
WB	2022	0.140	0.074	2.867	0.013	0.061	0.323	0.076	0.075	0.304
HB	2015	0.140	0.045	2.326	0.020	0.041	0.289	0.089	0.027	0.190
HB	2016	0.146	0.055	2.350	0.020	0.042	0.267	0.012	-0.029	0.170
HB	2017	0.131	0.053	2.828	0.017	0.036	0.229	0.013	0.041	0.179
HB	2018	0.152	0.056	2.842	0.020	0.037	0.328	0.043	0.032	0.130
HB	2019	0.146	0.064	2.856	0.021	0.043	0.248	0.015	0.020	0.132
HB	2020	0.155	0.071	2.867	0.021	0.042	0.131	0.060	0.046	0.153
HB	2021	0.141	0.074	2.867	0.019	0.042	0.173	0.094	0.065	0.155
HB	2022	0.148	0.071	2.880	0.016	0.048	0.175	0.076	0.075	0.198
NIB	2015	0.129	0.044	2.250	0.025	0.035	0.265	0.089	0.027	0.135
NIB	2016	0.152	0.047	2.270	0.024	0.034	0.202	0.012	-0.029	0.188
NIB	2017	0.140	0.049	2.298	0.032	0.035	0.230	0.013	0.041	0.156
NIB	2018	0.154	0.055	2.344	0.022	0.034	0.253	0.043	0.032	0.180
NIB	2019	0.148	0.066	2.853	0.021	0.033	0.225	0.015	0.020	0.142
NIB	2020	0.153	0.079	2.866	0.025	0.035	0.141	0.060	0.046	0.159
NIB	2021	0.154	0.080	2.880	0.022	0.039	0.101	0.094	0.065	0.175
NIB	2022	0.157	0.081	2.887	0.021	0.041	0.122	0.076	0.075	0.201
CBO	2015	0.107	0.033	2.333	0.027	0.053	0.427	0.089	0.027	0.210
CBO	2016	0.141	0.042	2.365	0.120	0.076	0.233	0.012	-0.029	0.232
CBO	2017	0.115	0.035	2.815	0.014	0.047	0.229	0.013	0.041	0.252
CBO	2018	0.122	0.037	2.846	0.015	0.042	0.348	0.043	0.032	0.302
CBO	2019	0.128	0.042	2.865	0.016	0.045	0.336	0.015	0.020	0.201
CBO	2020	0.142	0.086	2.878	0.023	0.050	0.260	0.060	0.046	0.152
CBO	2021	0.101	0.087	2.902	0.160	0.050	0.330	0.094	0.065	0.201
CBO	2022	0.098	0.084	2.921	0.016	0.212	0.330	0.076	0.075	0.172
LIB	2015	0.116	0.035	2.259	0.026	0.052	0.388	0.089	0.027	0.260
LIB	2016	0.123	0.037	2.295	0.024	0.541	0.411	0.012	-0.029	0.225
LIB	2017	0.139	0.084	2.786	0.025	0.040	0.268	0.013	0.041	0.304

LIB	2018	0.159	0.062	2.802	0.027	0.039	0.309	0.043	0.032	0.259
LIB	2019	0.144	0.091	2.823	0.026	0.038	0.339	0.154	0.020	0.220
LIB	2020	0.140	0.128	2.849	0.020	0.344	0.139	0.060	0.046	0.264
LIB	2021	0.169	0.818	2.850	0.105	0.038	0.045	0.094	0.065	0.009
LIB	2022	0.159	0.809	2.851	0.208	0.035	0.006	0.076	0.075	0.012
OB	2015	0.109	0.037	2.010	0.023	0.041	0.323	0.089	0.027	0.176
OB	2016	0.148	0.036	2.339	0.019	0.052	0.264	0.012	-0.029	0.192
OB	2017	0.129	0.049	2.810	0.182	0.048	0.391	0.013	0.041	0.290
OB	2018	0.151	0.055	2.832	0.031	0.040	0.429	0.043	0.032	0.563
OB	2019	0.145	0.066	2.849	0.323	0.039	0.347	0.015	0.020	0.328
OB	2020	0.183	0.703	2.853	0.025	0.045	0.178	0.060	0.046	0.224
OB	2021	0.152	0.707	2.865	0.210	0.047	0.162	0.094	0.065	0.240
OB	2022	0.143	0.712	2.877	0.230	0.048	0.228	0.076	0.075	0.215

Appendix-2

Source	SS	df	MS	Number of obs	=	72
Model	.009793391	8	.001224174	F(8, 63)	=	8.14
Residual	.009472554	63	.000150358	Prob > F	=	0.0000
				R-squared	=	0.5083
				Adj R-squared	=	0.4459
Total	.019265944	71	.000271351	Root MSE	=	.01226

LIR	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
DR	.0420755	.0098695	4.26	0.000	.0223529	.0617982
BS	.0222205	.0069444	3.20	0.002	.0083432	.0360978
PR	-.0533766	.02297	-2.32	0.023	-.0992784	-.0074748
OC	-.0464298	.0208405	-2.23	0.029	-.0880761	-.0047834
NII	-.066874	.0183236	-3.65	0.001	-.1034907	-.0302573
ER	-.0179447	.0549739	-0.33	0.745	-.1278012	.0919119
IR	-.2815169	.0808924	-3.48	0.001	-.4431675	-.1198663
LIQ	.0463272	.0220523	2.10	0.040	.0022592	.0903952
_cons	.0981692	.018815	5.22	0.000	.0605705	.135768

Appendix-3

(obs=72)

	LIR	DR	BS	PR	OC	NII	ER	IR	LIQ
LIR	1.0000								
DR	0.4200	1.0000							
BS	0.2398	0.2049	1.0000						
PR	-0.0142	0.3764	0.2291	1.0000					
OC	-0.1521	-0.0474	-0.0334	-0.0634	1.0000				
NII	-0.4360	-0.4284	-0.3260	-0.0817	0.0697	1.0000			
ER	-0.0456	0.2809	0.2013	0.0259	-0.0720	-0.2212	1.0000		
IR	-0.0310	0.3160	0.6343	0.2183	-0.1413	-0.3827	0.5772	1.0000	
LIQ	-0.0505	-0.2406	0.0056	0.1013	0.1035	0.4239	-0.0986	-0.1189	1.0000

Appendix-4

Variable	Obs	Mean	Std. Dev.	Min	Max
LIR	72	.1364722	.0164727	.098	.183
DR	72	.1177917	.1829889	.033	.818
BS	72	14.94332	3.545665	9.492	19.0271
PR	72	.0514542	.0722399	.0105	.323
OC	72	.0558407	.0711269	.0334	.541
NII	72	.2798583	.1006338	.006	.476
ER	72	.0523171	.0343514	.01234	.1535
IR	72	.034325	.029966	-.0294	.075
LIQ	72	.1946226	.0756458	.00901	.5634

Appendix-5

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of LIR

chi2(1) = 0.53

Prob > chi2 = 0.4646

White's test for Ho: homoskedasticity

against Ha: unrestricted heteroskedasticity

chi2(44) = 42.83

Prob > chi2 = 0.5219

Cameron & Trivedi's decomposition of IM-test

Source	chi2	df	p
Heteroskedasticity	42.83	44	0.5219
Skewness	12.44	8	0.1325
Kurtosis	0.21	1	0.6439
Total	55.48	53	0.3813

Appendix-6

Variable	VIF	1/VIF
IR	2.77	0.360410
BS	1.89	0.528136
ER	1.68	0.593834
NII	1.61	0.622818
DR	1.54	0.649270
LIQ	1.31	0.761010
PR	1.30	0.769119
OC	1.04	0.963795
Mean VIF	1.64	

Appendix-7

Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
res	72	0.97398	1.639	1.076	0.14095

Skewness/Kurtosis tests for Normality

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	Prob>chi2
res	72	0.0680	0.9960	3.47	0.1768

Ramsey RESET test using powers of the fitted values of LIR

Ho: model has no omitted variables

F(3, 60) = 1.26

Prob > F = 0.2971

Appendix-8

	Coefficients		(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
	(b) fe	(B) re		
dr	.8108873	.9631994	-.152312	.2267826
bs	-.0069168	-.0081712	.0012544	.00433
pr	.480483	.4957989	-.0153159	.0854914
oc	.166668	.2046686	-.0380006	.0973886
nii	-.0770647	-.0785937	.001529	.0118715
er	.0016029	.0015394	.0000635	.0008391
ir	.0013248	.000882	.0004428	.0040889

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

Test: Ho: difference in coefficients not systematic

chi2(7) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 2.31
Prob>chi2 = 0.9408

Wooldridge test for autocorrelation in panel data

H0: no first order autocorrelation

F(1, 9) = 4.827

Prob > F = 0.0556