ST. MARY'S UNIVERSITY

SCHOOL OF GRADUATE STUDIES

DETERMINANTS OF NONPERFORMING LOAN: EVIDENCE FROM PRIVATE COMMERCIAL BANKS IN ETHIOPIA

BY

MESERET HAILE

JUNE, 2018

ADDIS ABABA, ETHIOPIA

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A THESIS SUBMITTED TO ST. MARY'S UNIVERSITY, SCHOOL OF GRADUATE STUDIES IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS OF BUSINESS ADMINISTRATION

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DECLERATION

I hereby declare that this research is my original work towards the partial fulfillment of the requirement for the Masters of Business Administration and that to the best my knowledge has not been submitted previously for a degree or any other award in any university elsewhere.

Meseret Haile

Signiture _____

Date _____

STATEMENT OF CERTIFICATION

This is to certify that Ms. Meseret Haile has carried out her research work on the topic entitle "Determinates of Nonperforming Loan: Evidence from Private Commercial Banks in Ethiopia". This work is original in nature and it is sufficient for submission for the partial fulfillment four the award of Masters of Business Administration.

Abraham Gebregiorgis (Assistant Professor)

Signature _____

Date _____

DEDICATION

My charming son, Marcon Hailu.

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ABSTRACT

Banks role in the economy of any country is very significant. Lending is risky in that repayment of the principal loan plus interest is not always guaranteed. High levels of Non-performing Loans is as a result of failure to manage loans, this would likely affect the performance of Banks and the country's economy at large. In reference to private commercial banks in Ethiopia reports from 2002-2017 there was a decrease in NPLs between the studied period. Though there has been some decline in NPLs, the figures still remain high. The study seeks to fill the existing research gap by conducting a study to fixed effect model non-performing loans of private commercial banks in Ethiopia. Non-performing loans in Ethiopia from the empirical evidences that help answer the research objective. Secondary data from National bank of Ethiopia for 16 years period was used. The data that was collected in the study was quantitative. Regression analysis was used to analyze the data and find out whether there exists a relationship between bank specific factors and macro-economic factors in Private Commercial Banks in Ethiopia. In this research fixed effect model was used to link and assess the joint relationship between Nonperforming loan ratio and its determinants of Private Commercial Banks in Ethiopia. The study found out that there was a significant negative relationship between gross domestic product, exchange rate, bank size , loan to deposit and return to equity with non performing loan of private commercial banks in Ethiopia. The relationship between Lending rate, unemployment and capital adequacy with non-performing loans were found to be positive.

Key words: Non Performing Loans, Private Commercial Banks in Ethiopia and Macro and Bank specific Determinant of NPLs.

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Abbreviations and Acronyms

AB: - Awash Bank

BS: - Bank Size

BOA: - Bank of Abyssinia

CAR:- Capital Adequacy

CSA: - Central Statistical Agency

DB: - Dashen Bank

EXG :- Exchange rate

GDP: - Gross Domestic Product

LR: - Lending Rate

LTD:- Loan to Deposit

NIB: - Nib International Bank

NBE: - National Bank of Ethiopia

NPL: - Nonperforming Loan

ROE:- Return of equity

UB: - United Bank

UN:- Unemployment rate

WB: - Wegagen Bank

CHAPTER ONE: INTRODUCTION

This chapter begins with discussing background of the study that gives some insight on the issues of nonperforming loans (NPLs). After giving some insight on the issues of NPLs, statement of the problem part that shows the direction of the study, justifies the reason to carry out this study. Following this, both general and specific objectives of the study, then presents significance of the study, scope and limitation of the study, and organization of the paper.

1.1. Background of the Study

Financial system in Ethiopia is determined by banks where the banking systems account for majority of total capitals of the financial sector. The major financial institutions operating in Ethiopia are banks, insurance companies and microfinance institutions. Ethiopia has mixed banking system comprise state and private-owned banks. The role of commercial banks goes beyond the intermediation function, in that it also rewards the shareholders for their investment as a result of good financial performance. This in turn encourages additional investment and brings about economic growth while, poor banking performance can lead to banking failure and crisis which have negative repercussions on economic growth (Ongore and Kusa 2013; Soyemi, Akinpelu and Agunleye 2013).

Banking sectors play a key role in the development of an economy. The development role undertaken by banking sector determines the step for development of economy. Hence the stability of banking sector is a key for the development of an economy. The primary function of bank is mobilizing deposits from surplus units to deficit units in the form of loan and advances to various sectors such as agricultural, industry, personal and governments. However, in recent times, the banks have become very cautious in extending loans due to non-performing assets (Sontakke and Tiwari, 2013).

Therefore, commercial banks are one of the banking sectors which are the main source of funding to business activities as well as other projects throughout the country. They play a key role in the economy by mobilizing deposits from surplus units to deficit units in the form of loan and

advances. As noted by Daniel and Wandera (2013) they play a vital role to emerging economies where most borrowers have no access to capital markets. Thus, they are considered as an intermediary between the depositors and borrowers.

According to Rawlin et al.(2012), the principal aim of any business is to make profits. That is why any asset created in conduction of business should generate income for the business. Since this issue is applicable for the banking sector business, banks should give due consideration on the management of loans because lending is the main business of commercial banks and loan is normally the main assets and vital source of revenue for the commercial banks (Daniel and Wandera, 2013). Therefore, banks do grant loans and advances to individuals, business organizations as well as government in order to enable them operates on investment and development activities as a mean of contributing toward the economic development of a country in general and aiding their growth in particular.

Credit, operational and liquidity risks are dominant risks of commercial banks and that was expected to continue for five years from the study period and credit risk take 60% of total risk (NIBE 2009). Sixty percent Credit risk from total risk indicate that the availability of nonperforming loan and one of the most vital risk for Ethiopian commercial banks. Credit risk arises from nonperformance loan a borrower either inability or unwillingness to perform in the pre-commitment contracted manner and directly related to non-performing loans (Hailu, 2015).

Farhan et al (2012) specifically pointed out that banking failures have adverse effect on economic growth such that (i) bank failures is said to cause banking crisis and (ii) bank failure also reduces the flow of credit in the economy which in turn affects the efficiency and productivity of the business sector. Furthermore, according to BrowNIBridge (1998), most empirical researches supports confirms that most banking failure or banking crisis has been caused by non-performing loans. This study employs both micro and macro-economic factors and examines their effect on the performance of commercial banks in the Ethiopian private banking sectors.

1.2. Statement of the Problem

Commercial bank is an entity that acts as the middle person between two parties, lender and borrower. One of the main functions of commercial banks is accepting deposit and granting loans and advances, that perform their important role of channeling funds from people who have surplus funds to people who have deficit fund. The interest rate spread, which is the difference between the interest rate pay on deposits and the interest rate charged on the loans, is the main source of a bank's income. Therefore, loan is one of the major services provided by banks but it is also the most risky service because of the credit risk, which is directly related to non-performing loans (NPL) National Bank of Ethiopia has issued a directive which strictly requires all banks to maintain ratio of their non -performing loans below five percent in 2008. Basel standard of NPL ratio is also 5 percent. (NIBE, 2015).

NPLs has been high for long period and has started declining at a higher rate in the recent years. In the years 2001 to 2003, the ratio of NPLs has reached more than 50 percent and then started to decline to the extent of reaching less than 10 percent. However, the industry average of NPLs of private commercial banks over the sample period of 2002 to 2017 is still above the 5% of the Basel standard limit (NIBE,2015). However, credit risk management is indeed a very difficult and complex task in the financial industry because of the unpredictable nature of the macroeconomic factors coupled with the various microeconomic variables which are peculiar to the banking industry or specific to a particular bank (Garr, 2013). Therefore, identifying the factors that cause non-performing loans is key to the implementation of mechanisms that facilitate the avoidance of their occurrence. The causes for non-performing loans vary in different countries.

Theoretically, there are so many reasons as to why loans fail to perform. Some of these include depressed economic conditions, high real interest rate, inflation, lenient terms of credit, credit orientation, high credit growth and risk appetite, and poor monitoring among others. The causes of nonperforming loans can be categorized in to Bank specific and Macroeconomic factors (Emmanuel, 2014).

Many studies have examined the causes of non-performing loans in several countries around the world; however, little research has gone to the study of the causes of NPLs in Africa (Onsarig 2013). In Ethiopia, there has not been much research conducted on determinants of NPL, except the

study made by Daniel (2010), Tilahun and Dugasa (2014) and Habtamu (2015). Though the impact of macro-economic factors on NPLs are exhaustively examined at international level studies made in Ethiopian case, examines only bank specific factors. Studies that examine the factors leading to NPL like (Wondimagegnehu 2012; Gadise 2014 and Gebru 2015).The study of Wondimagegnehu was on bank specific factors of NPLs by OLS estimation model and the research of Gadise (2014) notified mainly on tax rate and bank specific factors like loan to deposit ratio, ROE, ROA and capital adequacy ratio by fixed effect model. Gebru (2015) indicated on poor credit analysis on the part of lending banks, unsound lending practices, failure in loan monitoring and follow-up, borrowers undesired culture, compromised integrity, fund diversion, and the like are the major causes behind NPLs. However, there is little empirical study on Ethiopia that has intensively investigated the relationship between the factors and NPLs. This study attempts on both macro and bank specific variables which are Gross domestic product (GDP), Exchange Rate (EXG), Lending rate (LR), Unemployment (UN), bank Size (BS), Return on Equity (ROE), Capital adequacy (CAR) and Loan to Deposit (LTD).

1.3. Basic Research Questions

RQ_1. What is the trend of NPLs in private commercial banks of Ethiopia?

RQ_2. How the bank-specific factors do affect the NPL of Private commercial banks of Ethiopia?

RQ_3. How the Macro-level factors do affect NPL of private commercial banks of Ethiopia?

1.4. Objective of the Study

1.4.1. General Objective

The main objective of the study is to examine the determinants of NPLs in Ethiopian private commercial Banks.

1.4.2. Specific Objective

- To assess the trend of NPLs Private Commercial Banks in Ethiopian.
- To investigate the major bank specific factors that is Capital Adequacy, Return on Equity, Loan to Deposit and Bank Size of NPL in Private Commercial Banks in Ethiopia
- To examine the effects of macro Level that is Gross Domestic Product, Exchange Rate, Lending Rate and Unemployment Rate determinants on NPLs of Private Commercial Banks in Ethiopia.

1.5. Significance of the Study

Lending and borrowing activities are the main purpose of financial institutions and it is the heart of economic cycle. If the lending and borrowing activities deteriorated due to the loan defaults ultimately it will affect all financial activities. By identifying the root causes of NPLs, the finding of this study will enable management of the banks to come out with practical policies aimed at improving the quality of their loan portfolios. It will also help the country policymakers to implement effective monetary policies concerning credits and therefore prevent the occurrence of non-performing loans in the economy. Apart from practical implications for commercial banks mangers and country policy makers, the study will extend the existing literatures by providing evidence on the determinants of NPLs in Ethiopian private commercial banking context by utilizing both macroeconomic and bank specific variables. Moreover, the study will play a significant role as a literature base on future researches of verifying the current findings, other aspects of NPLs of Ethiopian banks and other related topics in the banking sector. Hence, the study will have significant contribution for the banks society in general and also for the researchers, policy makers and managers specifically. Therefore, the study will assist the banks management to give due emphasis on the management of these variables or determinates that will be find throughout the study and provides them with understanding of activities that will enhance their loan performance. The results of the research also suggest for the regulatory body (NIBE) for the important bank related and macro-economic i.e. gross domestic product, lending rate, unemployment, exchange

rate related factors that they shall consider for safety and sustainable economic development by updating the directives and policies.

1.6. Scope of the Study

The Study focuses on determinants of NPLs in Private Commercial Banks in Ethiopian with ten years data from the year 2002-2017. Real gross domestic product, un-employment, lending rate, Exchange rate, loan to depots ratio, Capital adequacy, bank size, and return on equity were selected as independent variables and Non-Performing loan as dependent variable in this study. The variables of this study were selected owing to their ability to measure the level of NPLs in private commercial banks in Ethiopia. This study focuses on six private commercial banks that are registered by the NIBE and operational in the sixteen fiscal years (i.e.2002-2017 namely (Awash bank, Dashen Bank, Bank of Abyssinia, Wegagen bank, United bank and Nib International Bank) are selected by purposive sampling way.

1.7. Limitation of the Study

The study principally focuses on non-performing loans and particularly on the bank specific and macro-economic factors affecting non-performing loans. The researcher used only secondary sources of information not dating older than sixteen years to satisfy the qualitative aspects of the study such as the literature review. In this study the researcher were only consider sixteen fiscal years i.e. from 2002 up to 2017 for the NPL analysis of the following six selected private commercial banks; Awash bank, Dashen Bank, Bank of Abyssinia, Wegagen bank, United bank and NIB bank. Thus, this paper were show the trend of private commercial banks but not become whole mirror for a wide period. In addition, since it is not possible to incorporate all factors that affect NPLs in one study, only eight independent variable that is four banks specific such as Bank size, return on equity, Loan to deposit, Capital adequacy and four macroeconomic factors such as exchange rate, gross domestic product, un-employment and Bank size included in this study. Since the quantitative part of this study is mainly analyzed by the fixed effect model. The study used uNIBalanced data because the data of BOA and AB from 2002 to 2004 are extremely outlier so, to

solve this problem the researcher try to used dummy variables; but number of observation is affected by this result finally the researcher to decide use unbalanced data of BOA and AB.

1.8. Organization of the Study

Discussion in chapter two focuses on literature review of important concepts that are relevant to the study. The third chapter deals with the methodologies, which include data source, sampling frame and sampling size, data collection instrument, data analysis method and research variables in the study. The fourth chapter discusses the empirical findings of the study. Based on the finding of the study, the Fifth chapter presents summary and recommendation of the study.

CHAPTER TWO: LITERATURE REVIEW

This chapter starts with Theoretical Review presenting the overview of banking system in Ethiopia. Besides, bank loans including it determinant factors were presented. Furthermore, concepts relating to nonperforming loans are discussed. Following this, empirical studies are reviewed by focusing on determinants of NPLs are presented. Then after, the knowledge gaps from the reviewed literatures are outlined.

2.1. Theoretical Review

Overview of the Ethiopian Banking System

Bank of Abyssinia was the first bank established in Ethiopia based on the agreement between Ethiopian government and National bank of Egypt in 1905 with a capital of 1 million shillings. However, bank of Abyssinia was closed at in 1932 by Ethiopian government under Emperor Haile Selassie and replaced by Bank of Ethiopia with a capital of pound sterling 750,000. Following the Italian occupation between 1936-1941, the operation of bank of Ethiopia ceased whereas the departure of Italian and restoration of Emperor Haile Selassie's government established the state bank of Ethiopia in 1943. However, State bank of Ethiopia was separated into National bank of Ethiopia and commercial bank of Ethiopia S.C. to separate the responsibility of national bank from commercial banks in 1963. Following the declaration of socialism in 1974, the government extends the extent of its control over the whole economy and nationalized all large corporations. Accordingly, Addis bank and commercial bank of Ethiopia Share Company were merged by proclamation No.84 of August 2, 1980 to form single commercial bank in the country until the establishment of private commercial banks in 1994. The financial sector were left with three major banks namely;-National bank of Ethiopia, commercial bank of Ethiopia and agricultural and development bank during the socialist government.

Following the regime change in 1991 and the liberalization policy in 1992, these financial institutions were reorganized to work to a market-oriented policy framework. Monetary and Banking proclamation of 1994 established the National bank of Ethiopia as a legal entity. Following this, Monetary and Banking proclamation No.84/1994 and the Licensing and supervision of banking business proclamation No.84/1994 laid down the legal basis for investment in banking sectors. Currently, banking sectors in Ethiopia are showing progressive developments in terms of number of branches, total assets, human resource utilization and the like relative to other African developing countries. Moreover, new privately owned financial institutions were also allowed to work alongside the publicly owned ones. As a result, currently, the country has two public-owned and sixteen private banks, which are operating throughout the country (NIBE 2013/2014). The three governments owned banks are National Bank of Ethiopia, Development Bank of Ethiopia (DBE) and Commercial Bank of Ethiopia (CBE).The sixteen privately owned banks are Dashen Bank S.C (DB), Awash Bank S.C (AB), Wegagen Bank S.C (WB), United Bank S.C (UB), Nib International Bank S.C (NIB), Bank of Abyssinia S.C (BOA), Lion International Bank S.C (LIB), Cooperative Bank of Oromia S.C (CBO), Berhan International Bank S.C (BBI), Bunna International Bank S.C (BIB), Oromia International Bank S.C (OIB), Zemen Bank S.C (ZB), Abay Bank S.C. (AB), Addis international Bank SC. (AdIB), Debub Global Bank S.C. (DGB) and Enat Bank S.C. (EB). (Habtamu, 2012).

2.1.1. Theories of Non-performing Loans

Muriithi (2013) discussed the below four theories of NPL in detail as follow.

2.1.1.1 . Asymmetry Theory

The theory of asymmetric information tells us that it may be difficult to distinguish well from bad borrowers, which may result into adverse selection and moral hazards problems. The theory explains that in the market, the party that possesses more information on a specific item to be transacted is in a position to negotiate optimal term for the transaction than the other party. The party that knows less about the same specific item to be transacted is therefore in a position of making either right or wrong decision concerning the transaction. Adverse selection and moral

hazards have led to significant accumulation of Nonperforming loan in banks (Berger and DeYoung, 1997).

2.1.1.2. Agency Theory

According to the Agency theory, the principal agency problem can be reduced by better monitoring such as establishing more appropriate incentives for managers. In the field of corporate risk management agency issue have been shown to influence managerial attitudes towards risk taking and hedging. This Theory also explains a possible mismatch of interest between shareholder management and debt holders due to asymmetries in earning distribution, which can result in the firm taking too much risk or not engaging in positive net value project. Consequently, agency theory implies that defined hedging policies can have important influence on firm value Muriithi (2013).

2.1.1.3. Transaction Cost Theory

Transaction cost theory is based on convexities in transaction technologies. Here, the financial intermediaries act as coalitions of individual lenders or scale or scope in the transaction technology. Transaction cost theory has proven an essential framework for decision on the vertical boundaries of the firm. Transaction costs are the cost associated to the division of work. Transaction occurs when a good or service is transferred. Variables that describe a transaction are among others, the specificity, the uncertainty, and the frequency of the transaction, whether an asset or a service is only or much more valuable in the context of a specific transaction Muriithi (2013).

2.1.1.4. Stakeholder Theory

Stakeholders' theory, developed originally by Freeman in 1984 as a managerial instrument, has since evolved into a theory of the firm with high explanatory potential. Stakeholder theory focuses explicitly on equilibrium of stakeholder's interests as the main determinant of corporate policy. The most promising contribution to risk management is the extension of implicit contracts theory form employment to other contracts, including sales and financing. To certain industries, particularly

high-tech and services, consumer trust in the company being able to continue offering its services in the future can substantially contribute to company value. However, the value of these implicit claims is highly sensitive to expected costs of financial distress and bankruptcy. Since corporate risk management practices lead to a decrease in these expected costs, company value rises. Therefore stakeholder theory provides a new insight into possible rationale for risk management. However, it has not yet been tested directly Muriithi (2013).

2.1.2. Non-performing Loans

In this section the definition of NPL, classification of NPLs, and impact of NPLs on the operation of commercial banks are discussed. Loans and advances constitute the primary source of income by banks. As any business establishment a bank also seeks to maximize its profit. Since loans and advances are more profitable than any other assets, a bank is willing to lend as much of its funds as possible (Wondimagegnehu, 2012). However the bank should consider the credit risk that arises because the possibility that the expected cash flows from advances and securities held, might not be paid in full. Credit risk is dependent on the quality of assets, and is reflected through the volume of NPLs (Ekanayake & Azez, 2015). Different authors has defined the concept of non-performing loans in different available literatures. In general, loans that are outstanding in both interest and principal for a period of time contrary to terms and conditions spelt out in the loan agreement are considered as non-performing loans.

Under the Ethiopian banking business directive, non-performing loans are defined as “loans or advances whose credit quality has deteriorated such that full collection of principal and/or interest in accordance with the contractual repayment terms of the loan or advances in question (NIBE, 2008). It further states that loans or advances with pre-established repayment programs are non-performing when principal and/or interest is due and uncollected for Ninety consecutive days or more beyond the scheduled payment date or maturity (NIBE, 2008). Moreover, NIBE directive no SBB/43/2008 classified non-performing loans into four categories; special mention, substandard, doubtful and Loss.

2.1.2.1. Non-performing Loans Provisioning

National bank of Ethiopia directive requires all banks to maintain a provisions for Loan Losses account which shall be created by charges to provision expense in the income statement and shall be maintained at a level adequate to absorb potential losses in the loans or advances portfolio. In determining the adequacy of the provisions for Loan Losses Account, provisions may be attributed to individual loans or advances or groups of loans or advances. The provisions for Loan Losses Account always have a credit balance. Additions to or reductions of the provisions for Loan Losses Account should be made only through charges to provisions in the income statement at least every calendar quarter.

Banks are required to maintain the following minimum provision percentages against the total outstanding principal balance of each loan or advance classified in accordance with the criteria for the classification of loans or advances.

Table 2.1: Non-performing loans Provisioning in Percentage

Classification Category	Minimum Provision (percentages against the total outstanding principal balance)
Pass	1%
Special Mention	3%
Substandard	20%
Doubtful	50%
Loss	100%

Source: NBE (2015)

Determinants of Non-Performing Loans

The literature on the determinants of non-performing loans identifies two sets of factors to explain NPLs. The two concerns of the credit risk or the non-performing loans are (1) macroeconomic factors and (2) bank specific factors (Zurairah, 2010). The first group i.e. macroeconomic factors focuses on external events which are likely to affect the borrowers capacity to repay their loans, while the second group, which looks more at the variability of NPLs across banks, attributes the level of non-performing loans to bank-level factors. Empirical evidence, however, finds support for both sets f factors. Johannes P. S.(2015) examine the bank-specific determinants for non-performing loans in commercial banks in Namibia. The study employed time-series econometric techniques of unit root, co-integration, and impulse response functions and forecast error variance decomposition on the quarterly data covering the period 2001 to 2014. Two models were estimated in which return on assets and return on equity were alternating as profitability measures, among other variables that explain non-performing loans. The results reveal that return on assets, return on equity, loan to total asset ratio, log of total assets are the main determinants of non- performing loans. In specific terms, a negative relationship between non-performing loans and return on assets as well as return on equity was found. Furthermore, a positive relationship between non-performing loans and loan to total asset ratio was found. Lastly, the results revealed a positive relationship between non-performing loans and log of total assets.

Makri, Tsagkanos and Bellas (2014) study examined the factors affecting the non-performing loans rate of Eurozones' banking systems for the period 2000 -2008. A dynamic panel regression method for our analysis specifically, a Generalized Method of the Moments (GMM difference) technique was applied.

The variables used include both macro-variables (e.g. annual percentage growth rate of gross domestic product, public debt as percent of gross domestic product, unemployment) and micro-variables (e.g. loans to deposits ratio, return on assets and return on equity). The findings reveal strong correlations between NPL and bank-specific (capital adequacy ratio, rate of non-performing loans of the previous year and return on equity) factors.

Hassana, Ilyas and Rehman (2015) analyzed the bank-specific and social factors that influences non-performing loans in Pakistan. A survey questionnaire methodology was used in this study. The results show that various bank-specific factors like credit assessment, credit monitoring and rapid credit growth have significant effect on Non-Performing Loans, whereas interest has a weak significance on NPLs.

Hue (2015) examined the main factor influencing the non-performing loans in the Vietanams' banking system for the period 2009-2012. An ordinary least square method for panel data was applied to analyze the relationship between the NPLs and some bank-specific factors such as the lag of NPLs in the last year, the loans-to-asset ratio, total assets and the Dummy, which clarify whether a bank is state or not. The results showed that the four factors actually helped the growth of NPLs in recent years.

Rahman. (2017) assessed the Impact of Financial Ratios on Non-Performing Loans of Publicly Traded Commercial Banks in Bangladesh from 2010-2015. He applied an econometric model to find out correlations among financial ratios and a sample of 96 observations has been analyzed from 20 banks out of 30 listed commercial banks. The result indicates credit-deposit ratio and net interest margin have a positive influence on the non-performing loans and capital adequacy ratio and return on assets have a negative influence on the non-performing loans and sensitive sector's loan and priority sector's loan have significant positive influence on the non-performing loans and unsecured loans, profit per employee, and investment deposit ratio have significant negative impact on gross non-performing loan.

Skarica (2013) conducted a study on the determinants of NPLs in Central and Eastern European countries. In the study, Fixed Effect Model and seven Central and Eastern European countries for 2007-2012 periods was used. The study utilized loan growth, real GDP growth rate, market interest rate, Unemployment and inflation rate as determinants of NPLs. The finding reveals as GDP growth rate and unemployment rate has statistically significant negative association with NPLs with justification of rising recession and falling during expansions and growth has an impact on the levels of NPLs. This shows as economic developments have a strong impact on the financial

stability. The finding also reveals as inflation has positive impact with justification as inflation might affect borrowers' debt servicing capacities.

Makri (2014) identify the factors affecting NPLs of Euro zone's banking systems for 2000- 2008 periods before the beginning of the recession exclusively pre-crisis period. The study includes 14 countries as a sample out of 17 total Euro zone countries. The variables included were growth rate of GDP, budget deficit (FISCAL), public debt, unemployment, loans to deposits ratio, return on assets, and return on equity and capital adequacy ratio. The study utilized difference Generalized method of the Moments (GMM) estimation and found as real GDP growth rate, ROA and ROE had negative whereas lending, unemployment and inflation rate had positive significant effect on NPLs. However, ROA & loan to deposit ratio, inflation, and budget deficit did not show any significant impact on NPL ratio. Similarly, Carlos (2012) on macroeconomic determinants of the Non-Performing Loans in Spain and Italy found as inflation rate has insignificant effect on NPLs.

Selma and Jouini (2013) conducted a study on three countries namely Italy, Greece and Spain for the period of 2004-2008 to identify the determinants of non-performing loans for a sample of 85 banks. The variables included both macroeconomic variables (GDP growth rate, unemployment rate and real interest rate) and bank specific variables (return on assets, loan growth and the loan loss reserves to total loans). They apply Fixed Effect model and found a significant negative relationship of ROA & GDP growth rate, and also positive relationships of unemployment rate, the loan loss reserves to total loans and the real interest rate with NPLs.

For a significant positive association between NPLs and real interest rate, they justify that when a rise in real interest rates can immediately leads to an increase in non-performing loans especially for loans with floating rate since it decrease the ability of borrowers to meet their debt obligations. In addition, a significant negative relationship between ROA and the amount of NPLs justify that a bank with strong profitability has less incentive to generate income and less forced to engage in risky activities such as granting risky loans.

Klein (2013) investigates the determinants and macroeconomic performance of NPLs in Central, Eastern, and South Eastern Europe (CESEE) for 1998 to 2011 period data for ten banks of each 16 countries. The study includes loan growth rate, inflation, unemployment rate and GDP growth rate as explanatory variables of the study. The study was used fixed effect/ dynamic model and found as inflation has positive whereas loan growth rate, GDP growth rate have negative significant effect on the occurrences of NPLs. However, the study found as unemployment rate has no significant effect on NPLs.

Farhan et al. (2012) investigated the economic factors causing NPLs in the Pakistani banking sector using a primary data collected via a structured questionnaire from 201 bankers who are involved in the lending decisions or analyze the credit risk or handling NPLs portfolio. Correlation and regression analysis was carried out to analyze the impact of selected independent variables (Interest Rate, Energy Crisis, Unemployment rate, Inflation, GDP Growth, and Exchange Rate) on the NPLs of Pakistani banking sector. According to the results, Pakistani bankers perceive that Interest Rate, Energy Crisis, Unemployment, Inflation, and Exchange Rate has a significant positive relationship with the non-performing loans of Pakistani banking sector while GDP growth has significant negative relationship with the non-performing loans of Pakistani banking sector.

Ahmed and Bashir (2013) conducted a study on the "Macroeconomic Determinants of Nonperforming Loan of Banking Sectors in Pakistan": The study was conducted on 30 commercial banks from total of 34 banks in 1990-2011periods. The main aim of the study was to investigate impact of inflation, credit growth, GDP growth rate, Unemployment rate, consumer price index and lending/interest rate, on nonperforming loan. They found negative effect of lending rate and GDP growth rate on NPLs. Their justification for negative association between lending rate and NPLs implies that as lending rate increase, individuals with funds starts saving with the banks to earn on their funds but investors with the profitable projects feel reluctant to borrow and invest. Besides, existing borrowers pay back their loans to keep their credit rating good as to get loans in the future at discount rates. Similarly, on their study of banks specific factor of NPLs of banking sectors in Pakistan from 2006-2011 in 2013, they found positive significant effect of ROA but insignificant

effect of ROE on NPLs. Their justification for positive significant association between ROA and NPLs implies that in order to increase the short term earnings, banks management portray wrong picture to the investors relating the future profitability and positive return prospects. Consequently, investors start borrowing from the banks and invest in the less profitable projects. This results in the current good performance and profitability of the banks but because of the wrong forecasting, returns on the investments are not according to the investors' expectation, resulting in the inability of the investors in repayment of loans thus leading to the growth in NPLs.

The study of Saba et al., (2012) on the title of "Determinants of Nonperforming Loan on US banking sector" also investigate the bank specific and macroeconomic variables of nonperforming loans from 1985 to 2010 period using OLS regression model. They considered total loans, lending rate and Real GDP per capital as independent variables. The finding reveals as real total loans have positive significant effect whereas interest rate and GDP per capital has negative significant association with NPLs.

Louzis et al. (2010) conduct study to examine the determinants of NPLs in the Greek financial sector using fixed effect model from 2003-2009 periods. The variables included were ROA, ROE, solvency ratio, loan to deposit ratio, inefficiency, credit growth, lending rate and size, GDP growth rate, unemployment rate and lending rates. The finding reveals that loan to deposit ratio, solvency ratio and credit growth has no significant effect on NPLs. However, ROA and ROE has negative significant effect whereas inflation and lending rate has positive significant effect on NPLs. It justifies that performance and inefficiency measures may serve as proxies of management quality. Shingjergji (2013) conducted study on the "impact of bank specific factors on NPLs in Albanian banking system". In the study, capital adequacy ratio, loan to asset ratio, net interest margin, and return on equity were considered as a determinant factors of NPLs. The study utilized simple regression model for the panel data from 2002 to 2012 period and found as capital adequacy ratio has negative but insignificant whereas ROE and loan to asset ratio has negative significant effect on

NPLs. Besides, total loan and net interest margin has positive significant relation with NPLs. The study justifies that an increase of the CAR will cause a reduction of the NPLs ratio. Besides, an increase of ROE will determine a reduction of NPLs ratio. Besides, Swamy (2012) conduct study to examine the macroeconomic and indigenous determinants of NPLs in the Indian banking sector using panel data a period from 1997 to 2009. The variables included were GDP growth, inflation rate, per capital income, saving growth rate, bank size, loan to deposit ratio, bank lending rate, operating expense to total assets, ratio of priority sector`s loan to total loan and ROA. The study found that real GDP growth rate, inflation, capital adequacy, bank lending rate and saving growth rate had insignificant effect; whereas loan to deposit ratio and ROA has strong positive effect but bank size has strong negative effect on the level of NPLs. Detailed review of literature on the five dependent variables used in this study is discussed below.

Macroeconomic Factors

Banks has a major role in economic activity of every country through provision of different financial services. In addition to banks influence on economic activities, macroeconomic factors also affect activities of commercial banks in a given country. Macroeconomic variables, which were found to affect non-performing loans in literatures include the GDP, exchange rate, interest rate, and inflation and others. The following macroeconomic factors are reviewed from different banking area studies. The choice of GDP, unemployment, unemployment rate and other macroeconomic factors as determinants of NPLs is justified by the theoretical literature of life cycle consumption models. Two macro- economic variables used in this study are discussed below in detail.

Lending Rate

Lending rates/ interest rates are one of the primary economic determinants of NPL. There is an empirical evidence of positive correlation between the interest rate and NPLs (Nkusu, 2011). When the economic grows healthily, bank will not expect abnormal deterioration in their loan portfolio performance. This is because only a little portion of the loans will go default. However, if the recession occurs, borrowers may not be able to pay for the interest of the loan borrowed. The probability of default in loan increases. Thus, they believe that loan loss provision is positively

related to lending rate. An increase interest rate weakens loan payment capacity of the borrower therefore NPLs and bad loans are positively correlated with the interest rates (Nkusu,et.al 2011). As far as interest rate policy is concerned it plays very important role in NPLs growth rate in a country/economy.

Un-employment Rate

Un-employment is a phenomenon that occurs when a person who is actively searching for employment is unable to find work. Unemployment is often used as a measure of the health of the economy. This is based on the argument that an increase in the unemployment rate in the country negatively affects the incomes of the individuals which increases their debt burden Farhan et al. (2012) Unemployment rate, on the NPLs of Pakistani banking sector. According to the results, Pakistani bankers perceive that Interest Rate, Energy Crisis, Unemployment, Rate has a significant positive relationship with the non-performing loans of Pakistani banking sector. According to Selma and Jouini(2013) conducted a study on three countries namely Italy, Greece and Spain for the period of 2004-2008 to identify the determinants of non-performing loans for a sample of 85 banks. The variables included both macroeconomic variables (GDP growth rate, unemployment rate and real interest rate) and bank specific variables (return on assets, loan growth and the loan loss reserves to total loans). They apply Fixed Effect model and found a significant negative relationship of ROA & GDP growth rate, and also positive relationships of unemployment rate. According to Vogiazes and Nikolaidu (2011) that income and unemployment rates were the main factors that caused for loan losses. Saba et al. 2012 found that non-performing loans were positively associated with the unemployment rates. Their justification provides unemployment negatively affects income of individuals thereby increasing their debt burden and reduce consumption. Unemployment contributes to higher NPLs. This study expects positive relationship between unemployment and NPLs.

Gross Domestic Product

Most of the studies under review use Gross domestic product as the main macroeconomic indicator of non-performing loans. According to Jakubik (2007) gross domestic product (GDP) is a measurement of the cyclical position of the economy. The association between the real GDP and non-performing loans is still a subject of debate considering that there are findings, which have found that there is a positive, negative and no relationship, though most of the studies favor towards the negative relationship. Several empirical studies have found a negative association between NPL and real GDP growth (Fofack, 2005).

Furthermore, Onchomba (2014) show that GDP growth variable is significant and negatively related to the Nonperforming loans in Kenyan mortgage firms. Their study revealed that increase on GDP growth rates would lead to decrease in level of Nonperforming loans experience by the mortgage firms. The study revealed that there exists a significant negative relationship between Growth of GDP and non-Performing Loan in mortgage firms. Zribi and Boujelbène (2011) also indicate that gross domestic product will affect the bank credit risk. The overall effect of GDP growth should consider as the macroeconomic variable in order to determine the bank credit risk. They provide an analysis for Tunisia which determines a panel model which examine the ten commercial banks that cover the period from year 1995 to year 2008. They found that there is a negative relationship between GDP growth and bank credit risk.

As per the above studies, the GDP growth rate whether it is high or low is relatively a factor for the ability of loan repayment on the phases of economy. The above researchers support that, during the economic growth in the country, the higher level of GDP growth causes a higher level of income. Due to that, it will improve the ability of the borrower to pay their debts which will contribute to lower down the non-performing loan and bad debts in the bank. They also said, when there is economy downturn, the level of non-performing loan increases. Borrower tends to have less flow of income when the economy downturn, therefore their ability of repaying the loan will be lower

which caused the non-performing loan increased. Their results show that GDP growth is negatively related to the NPL.

On the other hand, some researcher found out that there is a positive relationship between GDP and bank credit risk. The study of Aver (2008) on Slovenian banks credit risk found that there is positive relationship between GDP and bank credit risk for the reason that banks are well prepared during unfavorable economy and market situation. Poudel's (2013) study on the macroeconomic determinants of bank credit risk in the Nepalese banking sector supports the above argument. His finding shows that when GDP growth is low, bank tends to be more careful on selecting the loan borrower and qualifying them based on their creditworthiness and credit condition. Therefore, the volume of credit during low economic growth tends to be reduced. Besides, bank will also strict in categorized their client and debtor during the economy downturn so that the bank can control the amount of non-performing loan which can contribute to bank credit risk. The association between the real GDP and non-performing loans is still a subject of debate considering that the above contradictory findings.

Exchange Rate (EXG)

According to Shingjergji (2013), the relationship between foreign exchange rate Euro/ALL and NPL ratio is positive. It is because borrowers always exposed to foreign exchange rate of Euro/ALL and it could increase the NPL ratio. Moinescu (2012) also proved that NPL is significantly adjusting to economic development while exchange rate changes exercise positive effects on it. Besides that Khemraj and Pasha (2009) also found that in the Guyanese banking sector, the real effective exchange rate has a positive effect on NPLs by referring to Jimenez and Saurina (2005) model. Real effective exchange rate is one of the main causes of the NPLs and it is statistically significant during sustainable economic downturns (Fofack, 2005). Furthermore, Klein(2013) suggested that exchange rate depreciation (against the euro) contribute to higher NPLs.

It is supported by De Bock and Demyanets, (2012) found that economic activity turns slow when NPLs increases, while exchange rate tends to depreciate. Based on Beck et al. (2013), the exchange rate is considered as possible determinants of NPLs. In particular, exchange rate depreciation increases the NPLs in countries with a higher degree of lending in foreign currencies to non-hedged borrowers. Besides that, a solution using the simple pair-wise regressions, it suggests NPLs has had a significant impact on the nominal effective exchange rate. Badar and Javid(2013) wrote a positive increase in exchange rate is related with NPLs. Depreciation in the value of home currency will result a higher cost for imported goods which directly shakes the confident of all commercial bank as default risk rises together. However, it is observed that the short run dynamics is weak between the NPLs and exchange rate as a vector error connection model. In simple, long run relationship is due to the weak relationship between NPLs and exchange rate.

Bank Specific Factors

The existence of non-performing loans for some borrowers under the same macro environment shows that macroeconomic factors, which are viewed as exogenous forces influencing the banking industry are not the exclusive determinants of NPLs. On contrary, the distinctive features of the banking sector and the policy choices of each particular bank with respect to their efforts for maximum efficiency and improvements in their risk management are expected to exert a decisive influence on the evolution of NPLs. (Onchomba, 2014). Three bank- specific variables used in this study are discussed below in detail.

Return on Equity (ROE)

Return on equity is defined as the ratio of net profit after tax to total equity. A number of authors consider return on equity as a measure of cost efficiency in explaining the causality from cost efficiency and/or bank performance to non-performing loans (Klien, 2013) and (Louize et al, 2010). Different hypothesizes shows cost efficiency and bank performance can be either positively or negatively correlated with NPLs. (Berger &DeYoung, 1997) stated that cost efficiency is positively or negatively associated with increases in future NPLs under bad management and skimping

hypothesis respectively. For the negative relationship aspects, if bank is inefficient the amount of credit risk measured by increase in nonperforming loan will increase because they might have problem in monitoring the internal cost of bank. If there have some unexpected event happened and out of bank's control, bank need to spend extra money to solve the problem, it will create low cost efficiency. If the bank decide not to spend enough resources to ensure high loan quality, the bank will become efficient. However the nonperforming loan might become higher. So, the relationship between bank efficiency and credit risk can be either positive or negative. (Louize et al, 2012) hypothesizes that Banks' performance is negatively or positively related with future NPLs under bad management II and Procyclical credit policy hypothesis respectively. Different authors has found a positive and negative relationship between return on assets (as a measurement of performance and cost efficiency) and NPLs. Godlewski (2004) found that the impact of banks' profitability as measured by return on asset is negative on the level of NPL ratio. Messai, et.al. (2013) also found a significant and negative relationship between the return on assets (ROA) and the amount of NPLs. This negative result supports the fact that a bank with strong profitability has less incentive to generate income and therefore less constrained to engage in risky activities such as granting risky loans. Instead, inefficient banks are obliged to grant credits considered risky and subsequently achieve high levels of impaired loans.

On contrary, Garciya-Marco and Robles-Fernandez (2008), using a panel of 129 banks applied in Spain for the period 1993-2000; indicate that high levels of profitability are followed by a greater future risk. They argue that the policy of profit maximization is accompanied by high levels of risk. The creation of higher-risk and lower quality loans to improve reported short term financial performance, might lead the bank to lose long term profitability. Then, the return on equity will be positively correlated to NPLs.

Bank Size (BS)

Bank size could reflect bank strength and ability to cope with the problem of information Asymmetry, resulting in lower level of NPLs. Contrary, smaller banks have fewer resources to realize credit analysis efficiently. Moreover, bank size may be an indicator of diversification

opportunities increasing of which should lower bank risk. Misra and Dhal (2010), and Das and Ghosh (2007) found a positive effect size of the bank on NPL. Their justification is that large banks are more likely to have relatively more NPLs, due to the balance sheet constraint. On the other hand, Hu et al, (2006) founds that bank size is negatively related to NPLs.

Moreover, much of the empirical evidence relating to the impact of bank size on NPLs is inverse (Rajan and Dhal, 2003; Salas and Saurina, 2002; Hu et al, 2006). According to these studies, the negative effect means that large banks have better risk management strategies and technology which definitely allows them for efficient information gathering, processing and analyzing which finish up with lower levels of NPLs as compared to smaller banks. The size of a bank is measured by the Natural log of total assets of each bank. A negative relationship between the size of a bank and bank's NPLs is expected in this study.

Loan to Deposit Ratio (LTD)

The loan to deposit ratio is affected by the operational strategy of a bank's management. Excessive rapid loan growth declined bank's capital levels and useful pointers the deterioration of banks financial health and can be employed as early warning indicators of future problem loans (Das and Ghosh 2007) As disclosed by Jimenez and Saurian (2006) loan growth is considered as one of the most important causes of problem loans. However, according to Sinkey and Greenwalt (1991) a rapid expansion of loan may not be a problem by itself, but such expansion leads to poor screening and lending to borrowers of inferior quality. : According to (Louziset al. 2012 ; Makri*et al*. 2014 and Swamy 2012) LTD ratio has positive and significant effect on the level of NPLs of banking sectors.

Capital Adequacy (CAR)

Capital adequacy is an indicator of the ability of banks to provide funds for expansion and accepting risk loss caused by the operations of the bank. The difference between total assets and total liabilities is called capital. It is the amount of own fund available to support the bank's business and act as a buffer in case of adverse situation. It shows ability of the firm that liability could be

privileged. Capital adequacy is the level of capital required by the banks to enable them withstand the risks such as credit, market and operational risks they are exposed to in order to absorb the potential loses and protect the bank's debtors. Capital adequacy is a measure of the overall financial strength of a bank. The higher the capital adequacy ratio, the higher the level of protection available to depositors and It is vital for maintaining soundness of the banking system since it acts as a cushion against panic or bank run or uncertainties (Keovongvichith 2012).

2.2. Empirical Studies on the Determinants of Non-performing Loans in Ethiopian Banks

In the context of Ethiopia, there are few studies that examine factors affecting NPLs of commercial banks. To the knowledge of the researcher there are four studies conducted on determinants of loan defaults. These studies are the work of Wondimagegnehu (2012), Daniel (2010), Tilahun and Dugasa (2014) and Habtamu (2015). This particular section provides a detailed review of those related studies conducted in the context of Ethiopia.

Wondimagegnehu (2012) investigated the determinants of NPLs in the context of Ethiopian Commercial Banks. The broad objective of this research was to identify bank specific determinants of non-performing loans. To achieve this broad objective, the study used mixed research approach.

More specifically, the study used survey of employees of banks, structured survey of documents of bank reports and unstructured interview of senior bankers. The findings of the study showed that, most likely factors that affect occurrences of non-performing loans in Ethiopian Private commercial banks are poor credit assessment, failed loan monitoring, underdeveloped credit culture, lenient credit terms and conditions, aggressive lending, compromised integrity, weak institutional capacity, unfair competition among banks, willful default by borrowers and their knowledge limitation, fund diversion for unintended purpose, and over/under financing by banks. In addition the study had carried out tests to assess the correlation of independent variable such as deposit, loans, and total asset and dependent variable NPL ratio. The result showed that at 0.05 level of significant, there were no statistically significant relationship between all independent variables and NPL. Based on

the finding of the study, the researcher suggested that banks should put in place a vibrant credit process that ensures proper customer selection, robust credit analysis, authentic sanctioning process, proactive monitoring and clear recovery strategies for sick loans; formulate a clear policy framework that addresses issues of conflict of interest, ethical standard and check and balance in credit process; organizational capacity enhancement of banks; deliberate effort to develop culture of the public towards credit and its management by banks and ensuring prudent policies that govern bank loans.

In another study titled "Assessment of factors affecting non-performing loans: The case of Ethiopian Private Banks", Habtamu (2015) assessed bank specific factors affecting occurrence of NPLs in Ethiopian private banks. A survey study research design of six private Banks was employed in his paper. Interviews and questionnaires to bank officers who involve in lending activities for at least five years were used to collect data for the study. The data was carefully coded and entered to SPSS software and analyzed by descriptive statistics. Accordingly the findings of the study showed that the major factors affecting NPLs were poor credit assessment, poor loan follow up, underdeveloped credit culture, lenient credit terms and conditions, knowledge limitation, compromised integrity, unfair competition among banks, fund diversion for unintended purpose and shareholders influences. On the other hand the research found that credit growth, and bank size have no or very minimal relationship with occurrence of NPLs. Findings of Habtamu (2015) study further indicated that non-performing loans have negatively affected the performance of Ethiopian private banks in terms of credit crunch and profitability. The study of Wondimagegnehu (2012) and Habtamu (2015) is quite similar except that the first one focuses on all commercial banks and the second one only on private commercial banks. Daniel (2010) had conducted a research titled "privately owned commercial banks in Ethiopia: issues of non-performing loans". The main focus of the study was on the non-performing loan management of private commercial banks in Ethiopia. To achieve this major objective the researcher examined trend of NPLs, nature of NPLs, proportion of NPLs with total loan and advance, and determinants of non-performing loans. The research has identified moral hazard of the borrowers, ineffective monitoring, and operational loss of the borrower were the reasons for high NPLs in private commercial banks in Ethiopia during the sample period. In a study titled "Bank- specific determinants of credit risk: empirical evidence from Ethiopian Banks" Tilahun and Dugasa (2014) examined the bank specific determinants of

credit risk in Ethiopian commercial banks. The quantitative research approach was adopted for the study.

A balanced panel data of ten commercial banks both state owned and private owned for the period 2007 through 2011 has been analyzed using random effects GLS regression. The regression results revealed that credit growth and bank size have negative and statistically significant impact on credit risk. Whereas, operating inefficiency and ownership have positive and statistically significant impact on credit risk. Finally, the results indicate that profitability, capital adequacy and bank liquidity have negative but statistically insignificant relationship with credit risk.

2.3. Literature Gap

The empirical literatures discussed so far showed that banks NPLs are determined by both macroeconomic and bank specific factors. However, Most of empirical evidences appeared to have focused on studies that were conducted in the banking sector of different countries outside Ethiopia.

This is because only few studies have assessed the determinants of NPLs, despite the fact that several studies were conducted by different researchers on the Ethiopian Banking sector. In most of the studies, NPLs are only considered as additional explanatory variable and not deeply investigated. Consequently, the Banking sectors in Ethiopia have so far received inadequate attention in the literature review of NPLs.

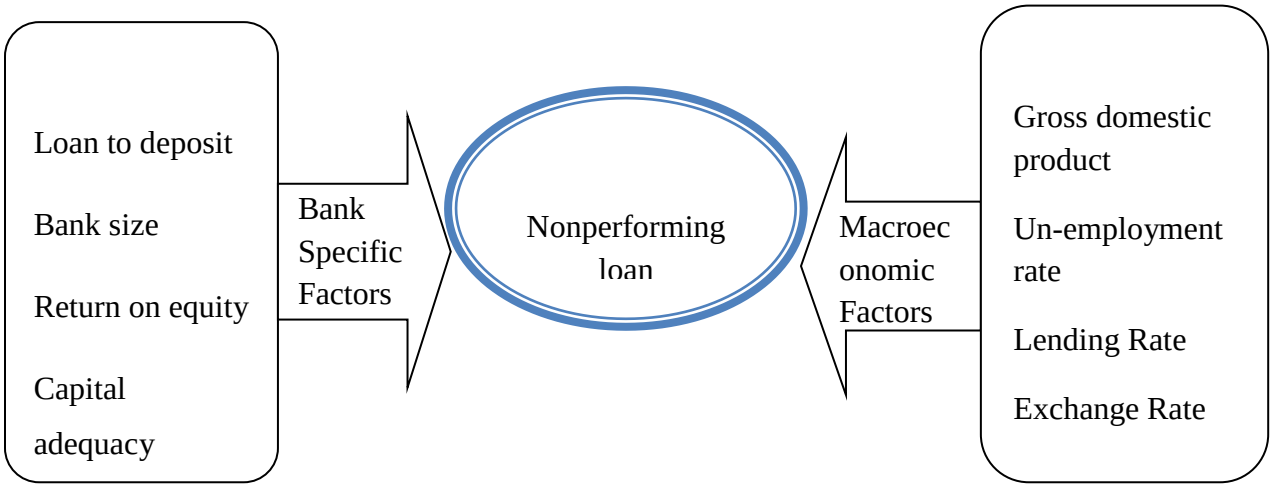
The variables influenced on NPLs are Macro-Economic Determinants such as Real GDP per capita, Inflation rate, tax rate, loan performance, lending rate, Exchange rate, unemployment rate etc. and Bank Specific Factors like loan to deposit ratio, ROE, ROA, capital adequacy ratios, Bank Size, poor loan follow-up, credit orientation, Lenient Credit Terms, Earning ability, poor risk assessment, cost efficiency, Lack of Strict Admittance Exit Policies, liquidity, Ownership structure etc. Hence, the researcher motivated to study on macro economic variables (GDP, Inflation Rates, lending rate and Exchange rate) and bank specific variables (bank size, loan growth, liquidity and Earning ability). Since in Ethiopia context except (Wondimagegnehu,2012) and (Gadise Gezu,2014), via different variables unlike the present study Except inflation rate by Gadise, it's not possible to get a

study on Determinant of Non Performing Loans' which took; with similar bank specific and macro-economic factors. (Gadise ,2014) indicates that inflation rate has insignificant impact on NPLs. In contrast (Chang ,2002, and Ekanayake and Azeez,2015) mentioned that inflation rate indicates a negative relationship with NPLs. In general, the lack of sufficient research on the determinants of NPLs in Ethiopian private commercial banking sector and the focus of the existing studies being only on the banks specific determinants of NPLs initiates this study. Hence, the purpose of this study is to investigate the determinants of NPLs in Ethiopian private commercial banking sector by utilizing an econometrics model so as to estimate both the macroeconomic and bank specific determinants of NPLs of private commercial banks in Ethiopia which is proposed to fill the existing knowledge gap.

2.4. Conceptual Framework

From the literature review, the researcher constructed the following conceptual framework to summarize the main focus and scope of this study in terms of dependent and independent variables included. This conceptual model adopted from (Shingjergji, 2013 and Muhammed, 2013). Accordingly, the estimated frame work used in this study are modified by researcher and presented as follow;

Figure 2.1: Conceptual Framework



Source: Developed for the research from Literature

CHAPTER THREE: RESEARCH METHODOLOGY

This study aims to examine the determinants of NPLs in the private commercial banks found in Ethiopia. Accordingly, this chapter discussed the research procedure that is used to carry out this study. In case, it starts by discussing research design followed by the nature and instruments of data collection and sampling design. Finally, definition of study variables with their measurement and model specifications are presented.

3.1. Research Design

Research design is a master plan specifying the methods and procedures for collecting and analyzing the required data. The choice of research design depends on objectives that the researchers want to achieve (John, 2007).The aim of the study was to examine determinates of Nonperforming loan from private commercial banks in Ethiopia. The characters of the study examine derived hypotheses and specify the relationship among variables (typically in terms of magnitude or direction) rather than developing it. The study is an explanatory research that used quantitative research approach.

Creswell (2003) discussed that explanatory studies unlike descriptive studies go beyond observing and describing the condition and tries to explain the reasons of the phenomenon. Explanatory research is devoted to finding causal relationships among dependent and independent variables. It implies how and why variables should be related and the existence of or a change in one variable or cause leads to change in other variable.

This study used Quantitative approach, as it is the best approach to test hypotheses and to identify factors that influence on outcome (Creswell, 2003). Quantitative approach specifies how and why the variables are interrelated and why independent variable, influence or affect a dependent variable non-performing loan so, the quantitative approach better provides and explain cause and effect relation. Quantitative approach can be expressed in terms of quantity and attempts to avoid bias in measurement by using standardized measurement tools in interpretation by using defined data

categories. It measures what happens (reliable and objective) rather than how someone feels about what happens(subjective).It tests a sample and generalize a population Often reduces and restructures a complex problem to a limited number of variables.

3.2. Nature of Data and Instruments of Data Collection

This study used panel data. The researcher prefers to use panel data since panel data can take heterogeneity among different units into account over time by allowing for individualspecific variables. Besides, by combining time series and cross-section observations, it gives more informative data. Furthermore, panel data can better detect and measure effects that simply cannot be observed in pure cross-section or pure time series data (Gujarati, 2004). Accordingly, the researcher used secondary sources of data that is panel in nature. A secondary source of data was preferred by the researcher since it is less expensive in terms of time and money while collecting. And also, it affords an opportunity to collect high quality data (Saunders , (2007) cited in Belay (2012). Secondary data may either be published or unpublished data (Kothari, 2004). Accordingly, secondary data was obtained from the audited annual financial statements of the concerned private commercial banks in Ethiopia. These data includes both bank specific and macroeconomic factors. The bank specific which was obtained from the National bank of Ethiopia, each selected private commercial banks whereas one of macroeconomic variable was collected from the central statistical agency (CSA).

3.3. Population and Sampling Design

3.3.1. Target Population

A population is the total collection of elements about which the researcher makes some inferences. The collection of all possible observations of a specified characteristic of interest is called a population while a collection of observations representing only a portion of the population is called a sample. In this study, the population is the banking sector in Ethiopia. The target population for this study was all private commercial banks that were registered by NIBE and operational in the country. Currently, the country has sixteen private commercial banks licensed and registered by the NIBE.

Table 3.1: List of private commercial banks in Ethiopia

No	Name of Banks	Year of Establishment
1	Awash Bank	1994 G.C
2	Dashen Bank	1995 G.C.
3	Bank of Abyssinia	1996 G.C.
4	Wegagen Bank	1997 G.C.
5	United Bank	1998 G.C
6	Nib Interantional Bank	1999 G.C.
7	Cooperative Bank of Oromia	2005 G.C.
8	Lion International Bank	2006 G.C.
9	Oromia International Bank	2008 G.C.
10	Zemen Bank s.c	2009 G.C
11	Buna International Bank	2009 G.C.
12	Berhan International Bank	2009 G.C
13	Abay Bank S.C	2010 G.C
14	Addis International Bank S.C	2011 G.C
15	Debub Global Bank S.C	2012 G.C
16	Enat bank	2012 G.C

Source: National Bank of Ethiopia (2017)

3.3.2. Sampling Design

Sample design deals with sample frame, sample size and sampling technique. Sampling is a technique of selecting a suitable sample for the purpose determining parameters of the whole population. Population is the list of elements from which the sample may be drawn (John, 2007). A sample is drawn to overcome the constraints of covering the entire population with the intent of generalizing the findings to the entire population.

As noted by Kothari (2004), good sample design must be viable in the context of time and funds available for the research study. Besides, judgmental sampling offers the researcher to deliberately select items for the sample concerning the choice of items as supreme based on the selection criteria set by the researcher. Accordingly, this study employed purposive sampling technique to select the required sample of banks from the above listed banks since it is viable in line with time and funds available for this study. The selection criteria set by the researcher was first, the required banks are only Private Commercial banks in Ethiopia. Second, those private commercial banks should operate before 2002 having financial statements for consecutive sixteen years. Therefore, the data for this study was collected from six private commercial banks in the country. There is Awash Bank (AB), Dashen Bank (DB), Wegagen Bank (WB), United Bank (UB), Bank of Abyssinia (BOA) and Nib International Bank(NIB) are private bank that were registered before 2002 by NIBE.

This is due to the fact that since the primary aim of this study is to examine the determinants of nonperforming loans evidence from Private commercial banks in Ethiopia, it is better to make generalization for the banking sector of the country based on data drawn from sample bank which is much more experienced in the industry. Thus, as one can understand from objective of the study, the researcher aimed to examine the determinants of nonperforming loans in Private Commercial banks in Ethiopia. In order to achieve the stated objective, the researcher classified banks based on years of their operation into those operated before 2002 and also based on whether they are Ethiopian Private commercial banks or not. Accordingly, this study focused on all private banks in Ethiopia that were established to give commercial banking services only and those operate before 2002. Thus, the researcher used 16 years data of selected private commercial banks in Ethiopia that provide financial statements consecutively from 2002-2017 periods.

To this end, the sample size of this study is not less than specified sample size required for ones' study since the accuracy and validity of the works never guaranteed by increasing the sample size beyond specified limit. This is due to the fact that increasing the number of sample size beyond the specified sample size required for ones' study never add value to the accuracy of the study rather it made information unmanageable due to redundancy (Ayalew, 2011).That is why this study used six experienced private commercial banks in Ethiopia from sixteen private banks in the country.

3.4. Model Specification

The aim of this study is to examine the determinants of NPLs of Private Commercial banks in Ethiopia. Similar to the most noticeable previous research works conducted on the nonperforming loan of financial sectors, this study used nonperforming loans ratio as dependent variables where gross domestic product (GDP),Exchange rate (EXR) Unemployment rate (UN), Lending rate (LR), capital adequacy(CAR), Loan to deposit (LTD), return on equity (ROE) and Bank Size (BS) with non-performing loan (NPL). The variables are taken from different papers discussed in the empirical literatures taking into consideration the availability of data.

3.4.1. Choosing Random Effect (RE) Versus Fixed Effect (FE) Models

Panel data uses two main techniques in its analysis and they include; Fixed and Random Effect Model. The Fixed Effect Model explores the relationship between predictor and outcome variables within an entity (bank, company person). Each entity has its own peculiar features that may or may not have an impact on the predictor variable (Reyna 2007). For instance, the policies of a particular country could have some impact on interest rate. This model assumes that the unique element with an individual may impact or bias the predictor or outcome variables and therefore there is the need to control for this. This is the motive behind the assumption of the correlation between entity's error term and predictor variables (Reyna 2007). This modeler moves the effect of time-variant characteristics so that the net result of predictors on the outcome variable can be ascertained. Another assumption this model is that those time-invariant features are distinctive to the individual and should not be correlated with the other individual features. Each entity is different therefore the entity's error term and the constant which involves individual features should not be correlated with the others (Reyna 2007).

This means FE is not suitable when the error terms are correlated because the implications may not be accurate.

The equation used in the FE model is given as:

$$Yit = \beta Xit + \alpha i + U$$

Where αi (i= 1…n) is the unknown intercept for each entity, Yit is the dependent variable (DV) ,i represents entity and t is time, Xit is the independent variable (IV), β1 represents the coefficient for the IV and U is the error term.

The Random effect model on the other hand is a special case of the fixed effects model. It is employed in analysis of hierarchical or panel data when one assumes no fixed effect. Thus it allows for individual effects. The brain behind this model is that the variance across entities is assumed to be random and uncorrelated with the predictor or independent variables. Random effect model assumes that the entity's error term is not correlated with the predictors which allows for time-invariant variables to play a role as explanatory variables. Therefore individual characteristics which may or may not have impact on the predictor variables must be specified. The down side is that, some variables may not be available therefore bias can occur in the model (Reyna 2007). According to Williams (2015), Random Effect models can be estimated through Generalized Least Squares (GLS). The random effect model is:$Yit = \beta Xit + \alpha + Uit + Єit$.

According to Gujarati (2004), 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). Hausman specification test which suggests the fixed effects model was better than random effects model as the p-value (0.00), is less than 0.05. Since the number of time series (i.e. 16 year) is greater than the number of cross-sectional units (i.e. six Private Ethiopian commercial banks), FEM is preferable. Thus, the researcher chooses fixed model based on the second argument.

The regression model which is existed in most literature has the following conceptual model adopted from (Shingjergji,2013) and (Muhammed, 2013). Accordingly, the estimated models used in this study are modified and presented as follow;

$NPL = \beta_0 + \beta_1 GDP + \beta_2 EXG + \beta_3 RLR + \beta_4 UN + \beta_5 ROE + \beta_6 BS + \beta_7 LTD + \beta_8 CRA + Ɛ$

Where; β_0 is the constant term

$\beta(1\text{-}8)$, is the coefficient of the independent variables of the study specific bank I at time t, ε the normal error term.

Ɛ represents error terms for intentionally unintentionally omitted or added variables. It has zero mean, constant variance and non- auto correlated.

3.5. Study Variables

Nonperforming loan ratio is dependent variables used in this study. It is measured in terms of Nonperforming loans to gross loan. Besides, explanatory variables included in this study are loan to deposit ratio, capital adequacy ratio, bank size, return on equity, lending rate, gross domestic rate, Unemployment rate and exchanger rate. As noted by Brooks (2008) 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.

3.5.1. Dependent Variable

Non-performing loan (NPLs) are considered a loan that is in default or close to being in default or it defined as a sum of borrowed money upon which the debtor has not made his or her scheduled payments for at least 90 days. The amount of non-performing loans depends on the ability of the bank to assess loan applicants „credit risk which is generally measured using the probability of default, loss given default and exposure at default (Nikolic et al,2013). The Ethiopian banking regulation also defines NPL as follows: "Nonperforming loan and advances are a loan whose credit quality has deteriorated and the full collection of principal and/or interest as per the contractual repayment terms of the loan and advances are in question" (NIBE, 2008).

$$\text{NPL ratio} = \frac{\text{Provision}}{\text{Total outstanding loan}}$$

3.5.2. Independent Variables

Independent variables are explanatory variables that explain the dependent variables. In case the independent factors of nonperforming loan indicators are macroeconomic GDP, EXR. UN and LR and bank specific factors are BS, ROE, LTD and CAR.

Macroeconomic factor

Real GDP: The real gross domestic product is the measure of total economic activity within the economy and it is commonly used economic indicator. In this study employed the gross domestic product growth as a measure of macroeconomic conditions. The gross domestic product growth is the annual change in the real GDP. Some Scholars stated that GDP is inversely associated with non performing loan such as, (Louzis, Vouldis and Metaxas ,2010) showed that gross domestic product (GDP) growth rate has a negative effect on problem loans, confirming that in times of recession, problem loans increase. In addition to the above scholars (Messai & Jouini, 2013), (Alizadeh Janvisloo & Muhammad, 2013) stated that non performing loan and GDP has indirect association ship. However, other authors (Shingjergji, 2013) notified that NPL and GDP has positive relationship.

H1: There is a significant negative relationship between GDP rate and NPLs.

Lending Rate: Lending rates are one of the primary economic determinants of non-performing loans. As far as interest rate policy is concerned it plays very important role in NPLs growth rate in a country/economy, Hoque and Hossain (2008) examined this issue and according to them non-performing loans are highly correlated with the high interest rates which enhances the debt burden of the borrowers and cause loan defaults. This variable is expected to have be positive association with NPLs. According to Glen and Mondragon-Velez (2011), changes of lending rate will affect the ability of borrowers to continue paying interest for the loan borrowed. There is an empirical evidence of positive correlation between the interest rate and non-performing loans (Nkusu, 2011).

H2: There is a significant positive relationship between Lending rate and NPLs.

Exchange rate: exchange rate will be difficult to predict in the next period, it can move in either upward or downward direction regardless of what the estimates and predictions were. An appreciation of exchange rate can have mixed effects. It may weaken the competitiveness of export-oriented firms and adversely affect their ability to pay their debts (Fofack, 2005) .However, it may improve the debt servicing capacity of borrowers whose loans are in foreign currencies. So, the relationship between EXR and NPL may be mixed.

H3: There is a significant positive relationship between exchange rate and NPLs.

Unemployment rate: According to Vogiazes and Nikolaidu (2011) that income and unemployment rates were the main factors that caused for loan losses. (Bofondi and Ropele 2011 and Saba et al. 2012) found that non-performing loans were positively associated with the unemployment rates. Their justification provides unemployment negatively affects income of individuals thereby increasing their debt burden and reduce consumption. Unemployment contributes to higher NPLs. This study expects positive relationship between unemployment and NPLs

H4. Unemployment rate has a significant positive relationship with Nonperforming loans bank

Bank Specific

Loan to deposit : it examines bank liquidity by measuring the funds that a bank has utilized into loans from the collected deposits.LTD ratio indicates the banks willingness to used depositors fund on credit activity to meet loan demand by reducing their cash assets. The LTD ratio measured by total loan to total deposit.

$$LTD = \frac{\text{Total Credit}}{\text{Deposit}}$$

H5: There is a significant positive relationship between loan to deposit and NPLs.

Bank Size: variable is expected to have a positive influence on the survival time for the banks. That is, as the size of the asset increase it is less likely that they will fail and longer the survival time. Larger banks have the advantage of better access to additional financing, dealing with liquidity problems and diversifying risk. (Langrin 2001) argue that size is a significant determinant of the time to bank failure. Some studies report a negative association between NPLs and bank size (Salas and Saurina, 2002, curak, Pepur ,Poposki, 2013). According to these studies, the inverse relationship means that large banks have better risk management strategies. There are also studies which provide evidence of a positive association between NPLs and asset size(Das and Ghosh,2007,Misra and Dhal, 2010). Asset size is measured by bank assets/ total banking sector asset value.

Logarism (Total Asset)

H6: There has significant negative relationship between bank size and NPLs.

Return on Equity: it measures profitability by revealing how much profit a bank can generates with the money shareholders have invested and it represents the rate of return generated by the owners' equity. ROE measured by the ratio of net profit to total equity.

$$ROE = \frac{\text{Net profit}}{\text{Total equity}}$$

H7: There is significant negative relationship between return on Equity and NPLs.

Capital adequacy (CAR): Empirically, there is no consensus on the relation between capital adequacy and NPLs. Sinkey and Greenawalt (1991) show that banks with adequate capital ratio experience lower rates of NPLs. On the other hand, found positive relationship between NPLs and capital adequacy ratio.

Banks with high levels of CARs might be encouraged to embark in riskier activities leading to riskier credit portfolios (Saba et.al. 2012; Rime 2011). Makri et al. (2014) suggest that negative relationship with NPLs since CAR increase absorb a risky loan portfolio is marked by a high NPL.

The study expects negative relation with NPLs.

CAR= Total Equity
Total Asset

H8: Capital adequacy ratio has significant negative relationship with Nonperforming loans

Table 3.2: Operational Definition& expected outputs

		Symbol	Explanation	Measurement	Expected sign
Dependent Variables		NPL	Nonperforming loan	Non-Performing Loans are loans that are past due. NPLs/ Gross loan	NA
Independent Variables	Bank Specific Variables	LTD	Loan to deposit ratio	Loan/Deposit	+
		BS	Bank Size	Natural Log of total asset	-
		ROE	Return equity	Net income /Total equity	-
		CAR	Capital adequacy	Total equity/Total asset	-
	Macro-economic Variables	LR	Real Lending rate	The average lending rate of banks	+
		GDP	Gross domestic product	The annual GDP growth rate	-
		UN	Unemployment rate	The annual unemployment rate	+
		EXG	Exchange rate	Average annual exchange rate (in %)	+

CHAPTER FOUR: FINDING AND DISCUSSION

This chapter deals with analysis of the finding and discussion of the result in order to achieve research objectives and set a base for conclusion. The data was analyzed in terms fixed effect model of via Eviews9 version. The first section of this chapter was discussion for the result of descriptive statistics including trend analysis of Nonperforming loans (NPLs) of private commercial bank in Ethiopia. Furthermore, the second section presents the basic tests for the assumptions of classical liner regression model. Next to this, model selection and regression result were presented. Lastly, the result of the regression analysis was discussed in detail.

4.1. Descriptive Statistics

Descriptive statistics that was intended to give general descriptions about the data (both dependent and independent variables) is presented in Table 4.1. The dependent variable nonperforming loans and the independent variables were classified into two, the macro economic factors (gross domestic product, unemployment, lending rate & exchange rate) and bank specific were (loan to deposit, capital adequacy, return equity and bank size) which were used to see the effect of on non performing loan . The total number of observation for each variable was 90. Accordingly, mean, median, standard deviation, minimum and maximum values of each variable were used so as to show the overall trend of the data over the period under consideration.

Under the table show that number of observation is 90 this is initially assume all the sample banks that is six bank with 16 years it is 96 observation but the study used unbalanced data the number of observation are 90 because the data of BOA and AB from 2002 to 2004 are extremely outlier so, to solve this problem the researcher try to used dummy variables; but number of observation is affected by this result finally the researcher to decide use unbalanced data of BOA and AB.

Table 4.1: Summary of Descriptive Statistics for dependent and independent variables

Variables	Observation	Mean	Standard deviation	Minimum	Maximum
NPL	90	0.058878	0.035662	0.015300	0.159500
GDP	90	0.091944	0.034204	-0.021000	0.126400
EXG	90	14.00672	5.168497	8.542500	22.41370
LR	90	11.59300	0.777355	10.50000	12.75000
UN	90	18.15333	4.297980	4.500000	26.40000
CAR	90	0.134294	0.089205	0.066900	0.922900
ROE	90	0.304577	0.083695	0.052151	0.488684
LTD	90	68.42027	12.66427	48.85000	101.5800
BS	90	22.54364	1.167148	19.56490	24.99000

Source: Financial Statements of Sampled Commercial banks, NIBE reports and CSA reports, 2018

NPLs ratio measured by Nonperforming loans divided by total loan rangers from 15.95-1.53 percent. It has a mean of 5.89% showing the lowest deviation 3.56% from its mean value. This indicants that commercial private banks in Ethiopia incurred 5.89% NPLs on average from its total loan. According to Ethiopian context, the banking sectors are required to maintain the ratio of NPLs at least below 5% (NIBE, 2008). However, as indicated above in table 4.1, the NPLs of private commercial banks in Ethiopia are more than the required threshold. Thus, NPLs problem are still serious for private commercial banks in Ethiopia.

Regarding LTD ratio that measured by total loans divided by total deposits, it ranges from a minimum of 48.85% to a maximum of 101.58%. It has a mean of 68.42% with highest deviation (12.66%) from its mean value.

ROE measured by the net profit divided by total equity of the bank measures how much the banks are efficiently earning from funds invested by its shareholders. As shown in the above table 4.1, ROE records a minimum of 5.2% and maximum of 48.9% with a mean of value of 30.45%.This implies that private commercial banks in Ethiopia have relatively a good performance in terms of ROE. Thus, commercial banks in Ethiopia earned high return from its own equity than assets.

CAR also measured by total equity divided by total assets presents a minimum of 6.7% and maximum of 92.29% with a mean value and standard deviation of 13.43% and 8.92%respectively. This indicates that CAR for the sample private commercial banks in Ethiopia during study period was above the minimum requirement, which is 8%.

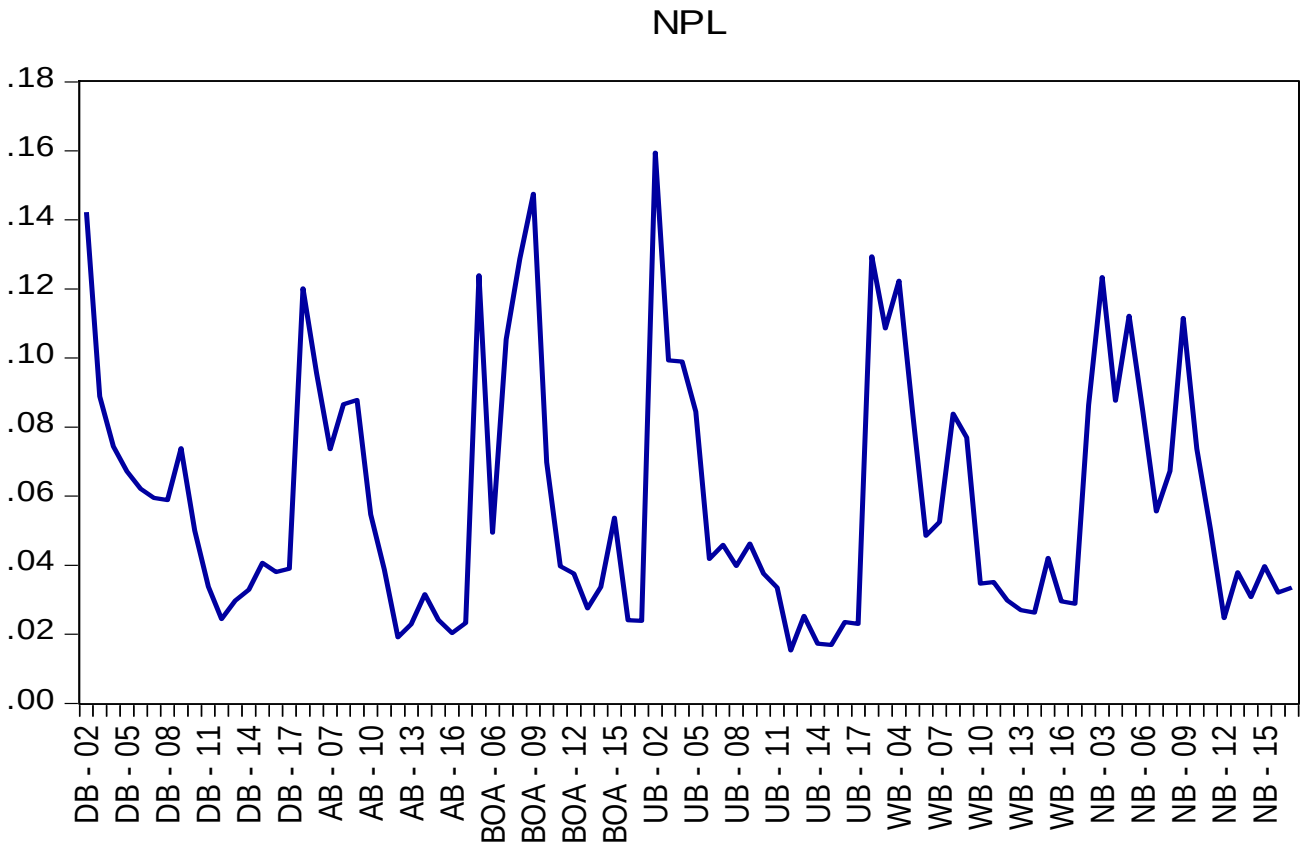
Furthermore, LTD ratio between total loans to total deposit had the highest deviation (12.66%) and the range between 101.58% - 48.85% with the mean value of 68.42.

To sum up BS is the natural logarism of total asset which is the range of 19.56 to 24.99 percent with the standard deviation 1.17% from the average value, whereas NPLs had the lowest deviation from its mean Value. Besides, private commercial banks in Ethiopia earned high return from its own equity than assets. Furthermore, average value of NPLs of private commercial banks in Ethiopia are above the required threshold (<5%) showing a serious loss from loans where as CAR are more than the minimum requirement (8%) showing better risk withholding ability of banks as per the National bank of Ethiopia.

4.2. Nonperforming Loans Trend Form 2002-2017

This section describes a pattern for nonperforming loans of Ethiopian private commercial banks operating in Ethiopia during the period from 2002-2017 .Accordingly, the following figure presents the respective graphical presentation for NPLs from 2002-2017. In the figure 4.1; x-axis represents the years via respective banks whereas y-axis represents the level of NPLs ratio of private commercial banks in Ethiopia.

Graph 4.1: Trend of NPL of the bank



Source: *Own computation from NIBE via Eviews version 9*

As it can been seen from the above fig 4.1, the trends of nonperforming loans of private commercial banks in Ethiopia for the period from 2002 to 2017 are decreasing. This significant decline of NPLs

might imply either improvement in the levels of loan quality or being escaping of banks from providing loan and advances. Even if, there is a decreasing trend in the level of NPLs ratio from 2002-2017, descriptive result shows that NPLs problem is still above the industry average for private commercial banks in Ethiopia. Thus, this result suggests the downward sloping trend of NPLs.

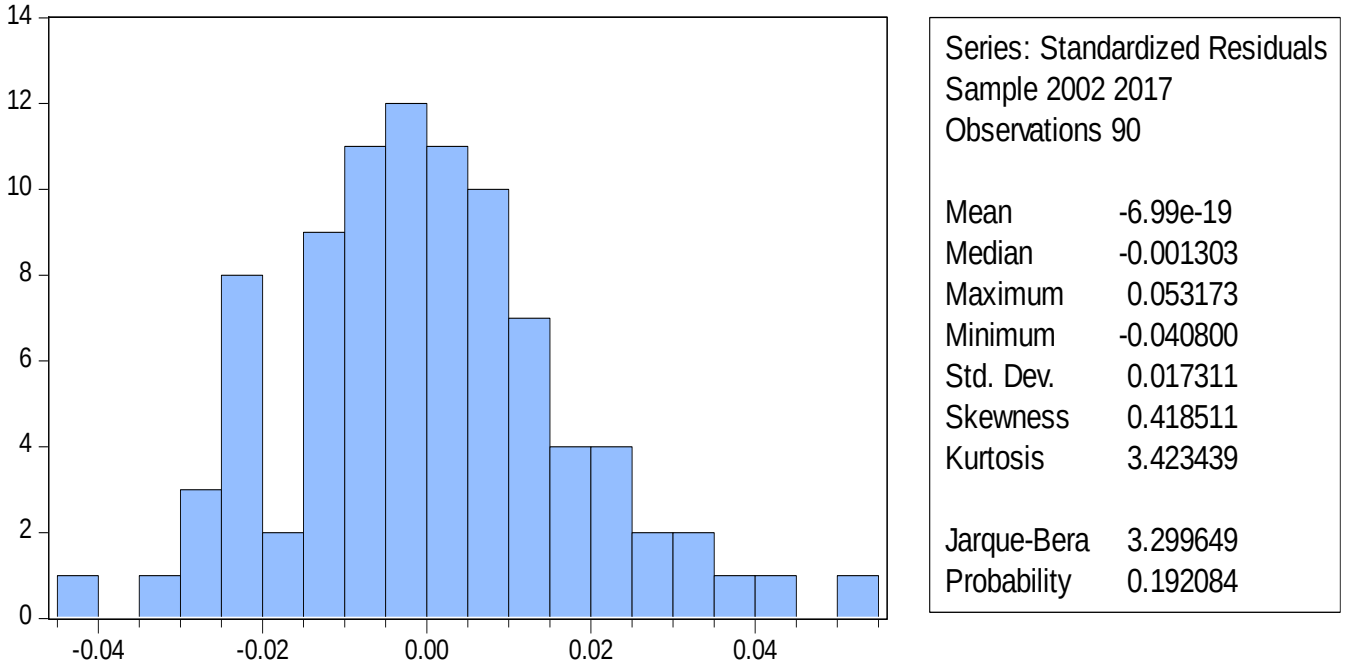
4.3. Tests for the Classical Linear Regression Model (CLRM) Assumptions

In the descriptive statistics part, the study shows the mean, standard deviation, minimum and maximum values of the dependent and explanatory variables including the number of observation for each variable during the period under consideration, that is from 2002-2017. According to Brooks (2008) five assumptions were made relating to the classical linear regression model (CLRM). Estimation of the model should have to meet the OLS assumptions to be the estimation BLUE (Best Linear Unbiased Estimators). As noted by Brooks (2008), when these assumptions are satisfied, it is considered as all available information is used in the model. However, if these assumptions are violated, there will be data that left out of the model. Accordingly, before applying the model for testing the significance of the slopes and analyzing the regressed result, normality, multicolinearity, autocorrelation and heteroscedasticity tests are made for identifying misspecification of data if any so as to fulfill research quality.

4.3.1. Normality Test

One assumption of classical linear regression model (CLRM) is the normal distribution of the residual part of the model. As noted by Gujarati (2004), OLS estimators are BLUE regardless of whether the ui are normally distributed or not. If the disturbances (ui) are independently and identically distributed with zero mean and constant variance and if the explanatory variables are constant in repeated samples, the OLS coefficient estimators are asymptotically normally distributed with means equal to the corresponding β's. However, as per the central limit theorem, if the disturbances are not normally distributed, the OLS estimators are still normally distributed approximately if there are large-sample data. Thus, since the sample size for this study is large enough, it is approximately considered as normally distributed. This implies that residuals are asymptotically normal in this study.

Graph 4.2: Normality test



Source: *Own computation from NIBE via Eviews version 9*

4.3.2. Heteroscedasticity Test

In the classical linear regression model, one of the basic assumptions is Homoskedasticity assumption that states as the probability distribution of the disturbance term remains same for all observations. That is the variance of each u_i is the same for all values of the explanatory variable. However, if the disturbance terms do not have the same variance, this condition of non constant variance or non-homogeneity of variance is known as heteroscedasticity (Bedru andSeid, 2005).Accordingly, in order to detect the heteroscedasticity problems, Breusch-Pagan or Cook-Weisberg test was utilized in this study. This test states that if the p-value is significant at 95confidence interval, the data has heteroscedasticity problem, whereas if the value is insignificant(greater than 0.05), the data has no heteroscedasticity problem. Thus, as shown in the table 4.2,there is no heteroscedasticity problem for this study hence the p value is 6.17% showing insignificant value.

Table 4.2. Heteroskedasticity Test: ARCH

F-statistic	3.551744	Prob. F(1,87)	0.0628
Obs*R-squared	3.490879	Prob. Chi-Square(1)	0.0617

4.3.3. Autocorrelation Test

Furthermore, the researcher tested the autocorrelation assumptions that imply zero covariance of error terms over time. That means errors associated with one observation are uncorrelated with the errors of any other observation. As noted by Gujarati (2004), the best renowned test for detecting serial correlation is Durbin Watson test. Accordingly, if the d computed nearest to 2inapplication, it is assumed that there is no autocorrelation problem. Thus, as shown in table 4.4 the computed "DW" in this study was 1.75 which is nearest to 2 implying the absence of autocorrelation problem. Thus, this implies that error terms are not correlated with one another for different observation in this study.

4.3.4. Multicolinearity Test

The term Multicolinearity indicates the existence of exact linear association among some or all explanatory variables in the regression model. When independent variables are multi collinear,there is overlapping or sharing of predictive power. Thus, if multicolinearity is perfect, the regression coefficients of the independent variables are undetermined and their standard errors are immeasurable (Gujarati, 2004). The multicolinearity makes significant variables insignificant by increasing p-value since increased p-value lowers the t-statistics value. Thus, the panel regression results with multicolinearity will shows significant variables as insignificant variables. The multicolinearity problem is solved by dropping highly correlated variables (Ahmad and Bashir, 2013).Then, the result provide more significant variables than before.

This is due to the fact that when explanatory variables are highly correlated with one another, they share the same information. Thus, the multicolinearity problem reduces the individual explanatory variables' predictive power. That is none of the predictor variables may contribute uniquely and

significantly to the prediction model after the other independent variables is included (Theodros, 2011).As noted by Gujarati (2004), the correlation analysis is made to describe the strength of relationship or degree of linear association between two or more variables. In Pearson correlation matrix, the values of the correlation coefficient range between -1 and +1. A correlation coefficient of +1 indicates that the two variables have perfect positive relation; while a correlation coefficient of -1 indicates as two or more variables have perfect negative relation. A correlation coefficient of 0, on the other hand indicates that there is no linear relationship between two variables (Bedru and Seid, 2005).Besides, as noted by Brooks (2008), zero correlation among explanatory variables is not occurring in any practical work. Thus, even if there is some indication for the existence of zero correlation among the explanatory variables, it does not have a great effect on the accuracy. Accordingly, Pearson correlation matrix is applied to examine the association between NPLs ratio, loan to deposit, capital adequacy ratio, return on equity, and bank size, average lending rate and gross domestic product and exchange rate where nonperforming loans are considered as dependent variable whereas others are independent variables. Thus, as it can be seen from table, 4.3 the result of Pearson correlation matrix indicates that NPLs has positive correlation with loan to deposit ratio. While the correlation between NPLs ratio with capital adequacy ratio, return on equity, and return on asset, average lending rate, inflation and effective tax rate is negative. Besides, the result of correlation analysis made in the above table clearly indicates that there is no significant multicolinearity problems among explanatory variables since each of them are not above 0.8 thresholds. As noted by in Gujarati(2004), a serious problem for Multicolinearity is occurred if the correlation is about 0.8.Thus, the explanatory variables are the basic determinants of NPLs of private commercial banks in Ethiopia. This of course enhanced the reliability of regression analysis. However, to reach such conclusion, this has to be supported by regression result after the appropriate model is applied as discussed in the upcoming sections.

Table 4.3: Multicolinearity Test

	NPL	GDP	EXG	LR	UN	CAR	ROE	LTD	BS
NPL	1.000000								
GDP	-0.190346	1.000000							
EXG	-0.757674	-0.096299	1.000000						
LR	-0.575931	-0.076820	0.701028	1.000000					
UN	0.569630	-0.268281	-0.528445	-0.395042	1.000000				
CAR	0.162240	-0.195268	0.021871	-0.005248	0.106324	1.000000			
ROE	0.196221	-0.019647	-0.426523	-0.373790	0.219487	-0.067411	1.000000		
LTD	0.505397	-0.040126	-0.645506	-0.748703	0.388515	0.017789	0.037371	1.000000	
BS	-0.755169	0.164843	0.767357	0.795750	-0.545397	-0.181392	-0.284758	-0.665042	1.000000

Source: *Own computation from NIBE via Eviews version 9*

4.4. Results of Regression Analysis

This section presents the regression result of fixed effect model that made to examine the determinant of NPLs of private commercial banks in Ethiopia. Accordingly, the regression result was made and coefficients of the variables were estimated via Eviews version 9 software.As stated earlier in model selection part, fixed effect regression model is an appropriate model used in this study. Thus, the model used to examine the determinants of NPLs of private commercial banks in Ethiopia in this study was:

$$\mathbf{NPL = \beta_0 + \beta_1 GDP + \beta_2 EXG + \beta_3 RLR + \beta_4 UN + \beta_5 ROE + \beta_6 BS + \beta_7 LTD + \beta_8 CRA + Ɛ}$$

Where;

NPL= Nonperforming loan ratio of bank

GDP= Gross domestic product

EXG= Exchange rate

RLR= Real lending rate

UN= Unemployment

ROE= Return on equity

BS= Bank size

LTD=Loan to deposit

CAR= Capital adequacy

β_0 = an intercept

β_1, β_2, β_3, β_4, β_5, β_6, β_7 and β_8 = estimated coefficient of explanatory variables for banks. Ɛ the error term for error terms for intentionally/unintentionally omitted or added variables. Accordingly, table 4.4 below presents the result of Fixed Effect regression model made to examine the impact of explanatory variables on NPLs. Hence, determinants of private commercial banks of Ethiopia non-performing loan are studied based on unbalanced panel data, where all the variables are observed for each cross-section and each time period.

The study has a panel data from the period 2002 up to 2017 and a cross section segment which considered six private commercial banks namely Dashn Bank, Awash Bank, Bank of Abyssinia, United Bank,Wegagen Bank and Nib International Bank. The study used panel data model and examined by fixed model analyze the relationship between private commercial banks in Ethiopia non-performing loan and determinant variables. All the proposed independent variables (i.e., Gross domestic product (GDP) Exchange rate (EXG) Unemployment (UN) Landing rate (LR), Loan to deposit ratio (LTD), Bank size (BS), Capital adequacy (CAR) and Return on equity (ROE) were regressed with respect to the dependent variable (NPLs).

Under the following regression outputs, the beta coefficient may be negative or positive beta indicates that each variable's level of influence on the dependent variable. P-value indicates at what percentage level of each variable is significant. R^2 values indicate the explanatory power of the model and in this study adjusted R^2 value which takes into account the loss of degrees of freedom associated with adding extra variables were inferred to see the explanatory powers of the models. The regression result in the following table 4.4 demonstrated both coefficients of explanatory variables' and corresponding p-values as follows.

Table 4.4: Results of Fixed effect regression Model

Dependent Variable: NPL

Method: Panel Least Squares

Date: 05/27/18 Time: 15:57

Sample: 2002 2017

Periods included: 16

Cross-sections included: 6

Total panel (unbalanced) observations: 90

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP	-0.147310	0.084312	-1.747189	0.0846
EXG	-0.004132	0.001255	-3.293553	0.0015
LR	0.005664	0.006320	0.896095	0.3730
UN	0.000897	0.000594	1.510559	0.1350
CAR	0.054650	0.024714	2.211274	0.0300
ROE	-0.103171	0.035928	-2.871614	0.0053
LTD	-0.000260	0.000300	-0.865674	0.3894
BS	-0.013975	0.006805	-2.053813	0.0434
C	0.405264	0.125145	3.238357	0.0018

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.764378	Mean dependent var	0.058878
Adjusted R-squared	0.724075	S.D. dependent var	0.035662
S.E. of regression	0.018733	Akaike info criterion	-4.975040
Sum squared resid	0.026670	Schwarz criterion	-4.586181
Log likelihood	237.8768	Hannan-Quinn criter.	-4.818229
F-statistic	18.96545	Durbin-Watson stat	1.754260
Prob(F-statistic)	0.000000		

Source: Own computation from NBE eviews 8, (2018)

Based on regression result, the relation between the variables included in the model can, therefore, be represented as follow;

$NPL = \beta_0 - 0.147310GDP - 0.004132EXG + 0.005664LR + 0.000897UN - 0.103171ROE - 0.013975BS - 0.000260LTD + 0.054650CRA + \varepsilon$

The value of the adjusted R-Squared is 72.4% which confirms that 72.4 percent of changes on dependent variable (NPL) are explained by independent variables of the model, 72.4%. The value of F-statistic (18.96) confirms the accuracy of the estimated model. F-statistics tests the null hypothesis that all of the slope parameters (β's) are jointly zero. Accordingly, the F-test result shows that the null hypothesis is rejected as the probability of F-stat is 0.0000. In other words, the change in GDP, EXG, LR, UN, BS, CAR, LTD and ROE collectively explain 72.4% of the variation in NPLs ratio of Ethiopian Private Commercial bank. Through the examination of coefficients for bank specific factors, GDP, EXG, ROE, LTD and BS had negative impact on NPLs. However LR, UN and CAR had positive impact on NPLs.

Gross domestic product (GDP) Exchange rate (EXG) Capital adequacy (CAR) and Return on equity (ROE), Bank size (BS), are found to be significant variables of nonperforming loans in Ethiopian Private Commercial banks. On the other hand the findings revealed that there is statistically insignificant relationship between macroeconomic variables Unemployment (UN) Lending rate (LR), and Bank specific variables Loan to deposit ratio (LTD)to NPLs of Ethiopian private commercial banks. The following section demonstrates the impact of each explanatory variable on Ethiopian private commercial banks NPL.

Determinants of Nonperforming Loans

Thus, taking into consideration that the basic aim of this study was to examine the determinants of NPLs of private commercial banks in Ethiopia, the estimation results of Fixed Effect Model that presents the impact of explanatory variables on NPLs were discussed as follows:

Gross domestic product rate (GDP)

GDP is the macroeconomic variables which measured by Real GDP growth (in percent). As per the above empirical model regression output. In this study real GDP has highly statistical significant and negative impact on NPLs 10% significance level (P-value=0.0846). GDP is goes up by one percent non performing loan is goes down by 14.7% provided other independent variables are constant. The coefficient signs of real GDP growth rate show that, economic growth has a negative impact on the NPL of Private commercial banks in Ethiopia. Expectedly the current econometric analysis indicate that real GDP growth is the main driver of nonperforming loan ratio in Ethiopia banking industry. The Encouraged Ethiopian economy over the study period creates the increment of the income which ultimately enhances the loan payment capacity of the borrower. This is because; the current Ethiopian economy growth could create a new and potential demand for the financial market and it might reduce the probability of default loan.

There are significant empirical evidence of negative association between growth domestic product and non-performing loans (Skarica 2013; ,Makri 2014; Selma and Jouini 2013;Klein 2013 and Farhan et al. 2012).

Un-employment Rate (UN)

UN is a phenomenon that occurs when a person who is actively searching for employment is unable to find work. The variable measured by annual percentage of unemployment rate.Indicates that there is no statistically significant impact of UN on the level of NPls with (P-value of 0.1350), which is not within the acceptable range 5%. The finding of the study consistent is with Klein (2013).The positive coefficient value of the estimate is consistent with the results of Selma and Jouini (2013) and Louzis et al. (2010). Generally, the study rejects the alternative hypothesis (i.e. there is insignificant positive relationship between UN and Private commercial bank in Ethiopia NPL).

Exchange Rate (EXG)

Among the external determinants Exchange rate is the main factor for non performing loans in Private Commercial Banks in Ethiopia. As a result exchange rate is average annual exchange rate (in percent).According to the regression result the exchange rate (EXG) has negative association

ship with non performing loans of the Private commercial banks of Ethiopia. Hence, it is observed that exchange rate has statistical significant and negative impact on NPLs at 1% and 5% significance level (P-value=0.0015). When exchange rate is goes up by one percent non-performing loan is goes down by 0.4% provided other independent variables are constant. Unlike of this paper regression result some Authors such as, Shingjergji 2013 and Farhan et al. 2012studied that the foreign exchange rate has a strong positive association with NPLs

Lending Rate (LR)

Lending interest rate indicates price the borrowers pay for loans and thus, debt service cost. Increase of interest rate produces additional debt burden and the level of non-performing loans goes up. Moreover, high lending rate reflects high risk premium that banks charge for low credit quality debtors, indicating poor credit portfolios (Curak , Pepur ,Poposki,2013). Hence, The last macro Economic determinants of this paper is average lending rate, which is measured by the average lending rate of all commercial banks. Based on the regression model output lending rate has negative association ship with nonperforming loan of Private commercial banks in Ethiopia as per the expectation. Hence, it is observed that lending rate has statistical insignificant on NPLs The result is supported by Shingjergji (2013) insignificant relation with NPLs and also Fofack (2005), and Kabra, 2010 and Louzis et al. (2011)stated that lending rate is positive relations with NPLs.

Loan to deposit (LTD)

Loan to deposit is the internal factors of NPLs of Private commercial banks of Ethiopia. It is the ratio of total loan too total deposit. The variables which show the relative credit ratio to total asset of commercial banks is negatively related to NPLs. Hence, it is observed that LTD has strongly insignificant on NPLs. Generally, reject the null hypothesis since there is a negative significant relationship between Loan to deposit and non-performing loans. This result is inconsistent with expected result for the study also conform the findings Rahman. (2017) and Makri (2014) found that there is a negative relationship between LTD and NPLs.

Return on equity (ROE)

Return on equity is other internal factors of the banks and the researcher measure it by net income over total equity of the Private Commercial banks in Ethiopia. Then as per expectation mentioned on chapter three the regression result shown that it has significant and negative relationship with NPLs. Since Return on equity has (P value=0.0053). When Return on equity is goes up by one percent non- performing loan is goes down by 10.3% provided other independent variables are constant. Inefficient banks are obliged to grant credits considered risky and subsequently achieve high levels of impaired loans. There is a negative and statistically significant relationship between ROE and NPLs. The result shows negative effect of bank profitability measured in terms of ROE on NPLs with a coefficient of -0.222149and a p-value of 0.0008 at 5% and 1% significance level. This result confirms the finding of (Makri et al.2014; Louzis et al. (2010)-; Klein, 2013; Shingjerji, 2013; and Ahmad and Bashir, 2013). This implies that deterioration of profitability ratio in terms of ROE leads to higher NPLs. Generally, the study accepts the alternative hypothesis (i.e. ROE is significant and negative relationship with Private Commercial bank in Ethiopia NPL).

Bank size (BS)

Larger banks have the advantage of better access to additional financing, dealing with liquidity problems and diversifying risk. Bank size is the internal factors of the study which is measured by natural log of total asset of the banks. According to the regression result bank size has negative association ship with nonperforming loan of Private commercial banks in Ethiopia. Hence, it is observed that bank size has statistical insignificant on NPLs at significance level (P value=0.0434). When bank size is goes up by one percent non- performing loan is goes down by 1.4% provided other independent variables are constant.

The size of the banks increase it is less likely that they will fail and longer the survival time. Negative relationship between size and bad loans indicated that larger banks are more able to solve problems of information asymmetry in comparison to their smaller counterparts. With skilled employees and quality information bases, larger banks are more effective in credit analysis and monitoring their debtors. And also larger banks have the advantage of better access to additional

financing, dealing with liquidity problems and diversifying risk. Shingjergji (2013) reported an inverse relationship due to the fact that big banks have large resources to evaluate their loans, which improve the quality of loans, and greater opportunities for portfolio diversification more than small banks.

Capital adequacy (CAR)

The last determinant of nonperforming loan is capital adequacy. It is the amount of Equity which holds against risky assets reserve to protect the depositors from any unexpected loss. The result of fixed effect model tale 4.4 indicate that total Equity to total asset ratio showed that the coefficient of Capital adequacy is 0.054650 and positive statistically significant relation with NPLs (p-value= 0.0300) at 5% level. Thus, implies that for one percent goes up banks' capital adequacy ratio, keeping other thing constant had resulted 5.5% changes on the levels of NPLs in same direction. The result is consistent with However; the finding is inconsistent with Makri (2014) the result of CAR Shingjergji (2013). Generally, the study not to reject the alternative hypothesis (Capital adequacy has a positive significant effect on Private commercial banks in Ethiopia of NPL).) The result indicates that higher capital requirement protects Private commercial banks in Ethiopia from providing loans to more risky projects. The capital increase improves the bank ability to with stand financial shocks.

Private commercial banks in Ethiopia if they have higher capital adequacy banks not interested for risky activity also high capital adequacy is measure the overall financial strength of a bank and indicator of efficient management .Efficient management leads to high screening, monitoring and controlling to borrowers of inferior quality if during the study period when Private commercial banks in Ethiopia hold higher amount of capital, they had low non-performing loan and when they hold lower amount of capital, Private Commercial bank in Ethiopia had high nonperforming loan.

This chapter discussed the results of descriptive and regression analysis regarding to the determinant factors of nonperforming loans of Private Commercial bank in Ethiopia. The regression revealed that GDP, EXG, LTD, BS and CAR are statistically significant factors that determine the NPLs of private commercial banks in Ethiopia. On the other hand, ROE, LR and UN are

statistically insignificant to explain NPLs of Private commercial banks in Ethiopia. The expected sign and the finding of the study are summarized in the following table 4.5.

Table 4.5: Summary of Result and expected signs of explanatory variables on the dependent variables

Hypothesis	Variables	Expected Signs	Actual Signs	Rejected/not rejected	AT significant level
H1	GDP	Negative & Significant	Negative & Significant	Not rejected	10%
H2	EXG	Positive & Significant	Negative & Significant	Not rejected	1% and 5%
H3	Unemployment Rate	Positive & Significant	Positive &Insignificant	Rejected	_
H4	Lending rate	Positive & Significant	Positive& Insignificant	Rejected	-
H5	Bank size	Negative & Significant	Negative & Significant	Not Rejected	5% & 10%
H6	Capital adequacy	Negative & Significant	Positive& Significant	Not rejected	5% & 10%
H7	Return on equity	Negative & Significant	Negative & Significant	Not rejected	1%, 5% and 10%
H8	Loan to deposit	Positive & Significant	Negative& Insignificant	Rejected	-

Source: Developed by the researcher.

CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS

In previous chapter presented descriptive and regression analysis to examined the determinant of NPL of Private Commercial bank in Ethiopia. This chapter discussed the summary, conclusions and recommendations of the study. The chapter organized in to two sections, the first section 5.1 presents conclusions of the study and section 5.2 presents the recommendations provided depend on the findings of the study.

5.1. Conclusions

The broad objective of the study was to investigate bank specific and macroeconomic determinants of NPLs in Private Commercial banks in Ethiopia. To achieve the broad objective of the study used quantitative research approach. The study used descriptive statistics and multiple linear regression analysis to analyzed and identify the influences of bank specific and macroeconomic factor on non-performing loans of six sampled Private Commercial banks in Ethiopia. A sample of 90 observations has been analyzed over the period from 2002-2017 and used unbalance panel data. Regression analysis and descriptive statistics were employed on secondary data collected from NIBE, each bank's financial statement of banks and Central statically agency. The researcher used fixed effect model and conducted by the ordinary listing square and CLRM assumptions test of the models no evidence for the presence of normality, heteroscedasticity, multicolinearity and autocorrelation problem. The study shows the cause-effect relationship between the bank specific, macroeconomic factor and non-performing loans of Private Commercial bank in Ethiopia.

The study uses four bank specific variables and four macroeconomic factors such Gross domestic product (GDP) Exchange rate (EXG) Unemployment (UN) Landing rate (LR), Loan to deposit ratio (LTD), Bank size (BS), Capital adequacy (CAR) and Return on equity (ROE).The findings of the study suggested the following conclusions.

The study shows that GDP, EXG, CAR, BS and ROE statistically significant effect on the level of NPLs. However, the regression model revealed the insignificant effect of LR, LTD and UN on the level of NPLs of commercial banks in Ethiopia for the period under consideration.

In Ethiopia In the sample period NPL was ranged from 1.53 % to 15.95% the minimum and maximum value respectively and It has a mean of 5.89% .The goal of this paper is to identify those factors that are responsible for non-performing loans of private Commercial Banks in Ethiopia. Awareness of such factors will help in the formulation of policies to address the problem of NPLs. The utilized data are financial report of Ethiopia private commercial banks from 2002-2017 Data on non-performing loans, Gross domestic product (GDP) Exchange rate (EXG) Unemployment (UN) Landing rate (LR), Loan to deposit ratio (LTD), Bank size (BS), Capital adequacy (CAR) and Return on equity (ROE were sourced from National Bank of Ethiopia (NBE) and Central Statistics Agency.

Based on the regression result this model is good fitted. Since all variables are statistically significant at 90% confidence (GDP), at 95% confidence (ROE & BS) and 99% & 95% confidence (EXG&ROE) The adjustedR^2 value resulted as 72.4 % of fitness can be observed in the sample regression line. Furthermore, it measures 72.4 percent of the total variation in the non performing Ratio, is explained by independent variables (Gross domestic product (GDP) Exchange rate (EXG) Unemployment (UN) Landing rate (LR), Loan to deposit ratio (LTD), Bank size (BS), Capital adequacy (CAR) and Return on equity (ROE) jointly.

Therefore, these eight variables explain 72.4% affected non performing loans and the remaining 27.4% was affected by other determinants which were not included on this paper. From the finding on the adjusted R squared, the study found that variation of 72.4% on the non-performing loans among private commercial banks in Ethiopia due to changes in non-performing loans among Private commercial banks in Ethiopia could be accounted for by changes in all aforementioned independent variables. The study also revealed that there was Gross domestic product (GDP)

Exchange rate (EXG) Loan to deposit ratio (LTD), Bank size (BS), and Return on equity (ROE) are negative relationship with NPLs in other hand positive association ship with Unemployment (UN),Landing rate (LR) and Capital adequacy (CAR) from the regression statistics result.

5.2. Recommendations

Based on the findings of the study the following recommendations were forwarded.

- Bank management analysis the credited effect on non performing loans and analysis for bank specific factor such as deposit, loan, capital and their return, also must give more emphasis credit and risk assessment and asset management decision and give priority for current asset specially loan in order to reduce the level of nonperforming loans.

- This study recommended to sampled private commercial banks in Ethiopia balance their loan in proportionate with customers' deposit. In addition, private banks should not use loan as customer holding and controlling of risk and assessment mechanism.

- Commercial Private bank in Ethiopia should try to enhance their return by engaging in calculated risk activity rather than risky activity. Instead of provide much amount of loan to increase their income, better to engaged in other less risky services to increase their fee such as electronic fund transfer, providing locker facilities and preferable for private commercial banks in Ethiopia to concentrate or diversify their credit portfolio by calculating risk relative to its return in order to reduce the level of nonperforming loans.

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APPENDIX

Raw Data

Name of Banks	Year	NPL	GDP	LR	EXG	BS	UN	ROE	CAR	LTD
DB	2002	0.1422	0.0163	10.7500	8.5425	21.1194	26.4000	0.4012	0.0669	79.2200
DB	2003	0.0889	-0.0210	10.7500	8.5809	21.4119	22.9000	0.4245	0.0700	81.0200
DB	2004	0.0744	0.1173	10.7500	8.6197	21.7080	20.6000	0.4201	0.0700	82.2200
DB	2005	0.0672	0.1264	10.5000	8.6518	21.9529	20.5000	0.4019	0.0710	84.2200
DB	2006	0.0621	0.1154	10.5000	8.6810	22.2375	20.4000	0.4804	0.0849	85.7600
DB	2007	0.0595	0.1179	10.5000	8.7943	22.5218	19.4000	0.4760	0.0901	82.0400
DB	2008	0.0589	0.1119	11.5000	9.2441	22.7800	17.1000	0.3418	0.0932	71.2300
DB	2009	0.0739	0.1004	12.2500	10.4205	22.9900	20.4000	0.3530	0.0934	56.1700
DB	2010	0.0500	0.1057	12.2500	12.8909	23.2300	18.9000	0.4079	0.0909	49.7700
DB	2011	0.0338	0.1128	11.8800	16.1178	23.4000	18.0000	0.4511	0.0953	52.5100
DB	2012	0.0244	0.0884	11.8750	17.2536	23.5800	17.6000	0.4887	0.1043	57.7600
DB	2013	0.0297	0.0966	11.8800	18.1947	23.7000	4.5000	0.3974	0.1036	55.9100
DB	2014	0.0329	0.0989	11.8800	19.0748	24.0400	17.4000	0.3275	0.1331	53.3300
DB	2015	0.0407	0.0897	11.8800	20.0956	24.7800	16.8000	0.3710	0.1049	58.1900
DB	2016	0.0380	0.0650	12.7500	21.1059	24.8000	16.9000	0.2831	0.1175	55.7800
DB	2017	0.0390	0.0750	12.7500	22.4137	24.9900	17.8000	0.2991	0.1182	57.5500
AB	2002	0.2402	0.0163	10.7500	8.5425	20.8294	26.4000	0.2999	0.1034	69.2200
AB	2003	0.2513	-0.0210	10.7500	8.5809	21.0605	22.9000	0.2212	0.1089	70.0100
AB	2004	0.1839	0.1173	10.7500	8.6197	21.2942	20.6000	0.2205	0.1100	71.9900
AB	2005	0.1202	0.1264	10.5000	8.6518	21.5235	20.5000	0.2281	0.1083	72.0100
AB	2006	0.0956	0.1154	10.5000	8.6810	21.8064	20.4000	0.3248	0.1157	72.9260
AB	2007	0.0736	0.1179	10.5000	8.7943	22.0660	19.4000	0.4238	0.1260	80.7200
AB	2008	0.0866	0.1119	11.5000	9.2441	22.2900	17.1000	0.4228	0.1001	70.7550
AB	2009	0.0878	0.1004	12.2500	10.4205	22.5800	20.4000	0.2653	0.1067	54.6710
AB	2010	0.0547	0.1057	12.2500	12.8909	22.7900	18.9000	0.3657	0.1063	51.5180
AB	2011	0.0387	0.1128	11.8800	16.1178	23.0300	18.0000	0.3779	0.1205	51.4800
AB	2012	0.0191	0.0884	11.8750	17.2536	23.2000	17.6000	0.3215	0.1258	59.8040
AB	2013	0.0229	0.0966	11.8800	18.1947	23.5000	4.5000	0.2822	0.1162	61.4580
AB	2014	0.0316	0.0989	11.8800	19.0748	23.7800	17.4000	0.2375	0.1175	61.0140
AB	2015	0.0242	0.0897	11.8800	20.0956	23.9700	16.8000	0.2704	0.1263	67.3960
AB	2016	0.0204	0.0650	12.7500	21.1059	24.0000	16.9000	0.2506	0.1263	67.6720
AB	2017	0.0233	0.0750	12.7500	22.4137	24.2300	17.8000	0.2520	0.1261	67.8900
BOA	2002	0.3795	0.0163	10.7500	8.5425	20.8560	26.4000	0.3240	0.1258	68.2200
BOA	2003	0.2843	-0.0210	10.7500	8.5809	21.0107	22.9000	0.3216	0.1121	71.2000

BOA	2004	0.1751	0.1173	10.7500	8.6197	21.1839	20.6000	0.3103	0.1131	77.5500
BOA	2005	0.1240	0.1264	10.5000	8.6518	21.4445	20.5000	0.3240	0.1135	83.2200
BOA	2006	0.0494	0.1154	10.5000	8.6810	21.7650	20.4000	0.3061	0.1333	90.1700
BOA	2007	0.1054	0.1179	10.5000	8.7943	21.9458	19.4000	0.2358	0.1126	84.7100
BOA	2008	0.1287	0.1119	11.5000	9.2441	22.1700	17.1000	0.0522	0.0984	81.0000
BOA	2009	0.1475	0.1004	12.2500	10.4205	22.4200	20.4000	0.2800	0.0948	60.2800
BOA	2010	0.0698	0.1057	12.2500	12.8909	22.5600	18.9000	0.3353	0.0932	61.3600
BOA	2011	0.0397	0.1128	11.8800	16.1178	22.7000	18.0000	0.3910	0.0908	54.5600
BOA	2012	0.0376	0.0884	11.8750	17.2536	22.8300	17.6000	0.3183	0.1100	57.5600
BOA	2013	0.0275	0.0966	11.8800	18.1947	23.0400	4.5000	0.3173	0.1090	55.3400
BOA	2014	0.0337	0.0989	11.8800	19.0748	23.5300	17.4000	0.2299	0.1356	55.6400
BOA	2015	0.0537	0.0897	11.8800	20.0956	23.7900	16.8000	0.2065	0.1325	53.1100
BOA	2016	0.0241	0.0650	12.7500	21.1059	23.8900	16.9000	0.2294	0.1262	58.7600
BOA	2017	0.0239	0.0750	12.7500	22.4137	23.9200	17.8000	0.2299	0.1264	59.2200
UB	2002	0.1595	0.0163	10.7500	8.5425	19.5649	26.4000	0.4012	0.9229	74.5500
UB	2003	0.0993	-0.0210	10.7500	8.5809	19.9661	22.9000	0.4162	0.0932	80.1200
UB	2004	0.0990	0.1173	10.7500	8.6197	20.3287	20.6000	0.1666	0.0934	78.9900
UB	2005	0.0845	0.1264	10.5000	8.6518	20.7937	20.5000	0.4174	0.0947	78.2200
UB	2006	0.0418	0.1154	10.5000	8.6810	21.1926	20.4000	0.3117	0.1196	82.3000
UB	2007	0.0459	0.1179	10.5000	8.7943	21.5040	19.4000	0.2415	0.1648	91.5000
UB	2008	0.0398	0.1119	11.5000	9.2441	21.9020	17.1000	0.2689	0.1439	76.1000
UB	2009	0.0462	0.1004	12.2500	10.4205	22.2600	20.4000	0.2568	0.1118	59.5000
UB	2010	0.0376	0.1057	12.2500	12.8909	22.4900	18.9000	0.3885	0.1081	55.3000
UB	2011	0.0335	0.1128	11.8800	16.1178	22.7600	18.0000	0.3578	0.1167	54.0000
UB	2012	0.0153	0.0884	11.8750	17.2536	22.8900	17.6000	0.3690	0.1254	60.5000
UB	2013	0.0253	0.0966	11.8800	18.1947	23.0200	4.5000	0.3115	0.1203	58.4000
UB	2014	0.0173	0.0989	11.8800	19.0748	23.5300	17.4000	0.2292	0.1326	56.9000
UB	2015	0.0169	0.0897	11.8800	20.0956	23.9500	16.8000	0.2124	0.1174	58.1000
UB	2016	0.0235	0.0650	12.7500	21.1059	23.9900	16.9000	0.2068	0.1200	65.5000
UB	2017	0.0230	0.0750	12.7500	22.4137	24.2300	17.8000	0.2042	0.1222	66.2200
WB	2002	0.1294	0.0163	10.7500	8.5425	20.2863	26.4000	0.3601	0.1112	76.1200
WB	2003	0.1086	-0.0210	10.7500	8.5809	20.6056	22.9000	0.3512	0.1114	76.2500
WB	2004	0.1224	0.1173	10.7500	8.6197	20.8543	20.6000	0.3519	0.1115	77.0100
WB	2005	0.0841	0.1264	10.5000	8.6518	21.2032	20.5000	0.3513	0.1115	63.2200
WB	2006	0.0485	0.1154	10.5000	8.6810	21.5382	20.4000	0.3700	0.1127	77.0000
WB	2007	0.0525	0.1179	10.5000	8.7943	21.9702	19.4000	0.3777	0.1159	79.1300
WB	2008	0.0839	0.1119	11.5000	9.2441	22.1400	17.1000	0.3138	0.1468	79.1100
WB	2009	0.0770	0.1004	12.2500	10.4205	22.3500	20.4000	0.3062	0.1634	56.6600
WB	2010	0.0347	0.1057	12.2500	12.8909	22.4700	18.9000	0.3019	0.1832	63.0600

WB	2011	0.0351	0.1128	11.8800	16.1178	22.8100	18.0000	0.3426	0.1659	48.8500
WB	2012	0.0298	0.0884	11.8750	17.2536	22.8400	17.6000	0.2857	0.1922	61.9200
WB	2013	0.0270	0.0966	11.8800	18.1947	23.0600	4.5000	0.2457	0.1761	62.1200
WB	2014	0.0263	0.0989	11.8800	19.0748	23.2500	17.4000	0.1930	0.1860	54.9200
WB	2015	0.0421	0.0897	11.8800	20.0956	23.6500	16.8000	0.1874	0.1761	61.5100
WB	2016	0.0295	0.0650	12.7500	21.1059	23.7700	16.9000	0.1705	0.1733	67.7500
WB	2017	0.0288	0.0750	12.7500	22.4137	23.8900	17.8000	0.1710	0.1722	68.0100
NIB	2002	0.0864	0.0163	10.7500	8.5425	20.0959	26.4000	0.2999	0.1200	88.2100
NIB	2003	0.1234	-0.0210	10.7500	8.5809	20.6011	22.9000	0.2992	0.1221	85.2200
NIB	2004	0.0877	0.1173	10.7500	8.6197	20.9440	20.6000	0.2988	0.1234	92.5000
NIB	2005	0.1122	0.1264	10.5000	8.6518	21.2725	20.5000	0.2947	0.1287	96.2200
NIB	2006	0.0847	0.1154	10.5000	8.6810	21.4298	20.4000	0.2794	0.1406	101.5800
NIB	2007	0.0556	0.1179	10.5000	8.7943	21.6815	19.4000	0.2478	0.1631	96.7000
NIB	2008	0.0673	0.1119	11.5000	9.2441	22.0100	17.1000	0.2654	0.1639	85.5800
NIB	2009	0.1116	0.1004	12.2500	10.4205	22.2900	20.4000	0.3914	0.1516	67.3600
NIB	2010	0.0737	0.1057	12.2500	12.8909	22.5100	18.9000	0.2398	0.1535	61.6900
NIB	2011	0.0504	0.1128	11.8800	16.1178	22.6800	18.0000	0.2939	0.1646	54.0000
NIB	2012	0.0247	0.0884	11.8750	17.2536	22.9300	17.6000	0.2549	0.1846	64.0000
NIB	2013	0.0379	0.0966	11.8800	18.1947	22.9600	4.5000	0.2272	0.1822	68.0000
NIB	2014	0.0308	0.0989	11.8800	19.0748	22.9900	17.4000	0.2111	0.1828	68.0000
NIB	2015	0.0397	0.0897	11.8800	20.0956	23.0100	16.8000	0.2025	0.1642	71.0000
NIB	2016	0.0321	0.0650	12.7500	21.1059	23.2200	16.9000	0.1822	0.1591	60.0000
NIB	2017	0.0335	0.0750	12.7500	22.4137	23.2300	17.8000	0.1811	0.1600	72.0000