DETERMINANTS OF NONPERFORMING LOANS: EMPIRICAL STUDY IN CASE OF COMMERCIAL BANKS IN ETHIOPIA

A THESIS SUBMITTED TO
SCHOOL OF POSTGRADUATE IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF MASTERS OF SCIENCE
(MSC) IN ACCOUNTING AND FINANCE

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JUNE, 2014
JIMMA, ETHIOPIA

Abstract

As noted by Sharon (2007), loans have a vital contribution towards development of economy. However, its nonpayment also leads to incidence of huge loss on banks in particular and country in general. Hence, this study was conducted to examine both bank specific (loan to deposit ratio, capital adequacy ratio, return on asset and return on equity) and macroeconomic (lending rate, inflation and effective tax rate) determinants of NPLs of commercial banks in Ethiopia. To this end, the researcher has selected eight senior commercial banks in Ethiopia judgmentally. This study used secondary sources of data, which is panel data in nature, over the period 2002-2013 These data were collected from NBE and CSA. Furthermore, fixed effect model was used to examine the determinants of NPLs. This research is an explanatory research design that identifies the cause and effect relationships between the NPLs and its determinants.

The study shows a down ward sloping of nonperforming loans for commercial banks in Ethiopia. The finding also revealed as LTD ratio had positive whereas INFR had negative, but insignificant effect on NPLs of commercial banks in Ethiopia. However, bank profitability measured in terms of ROE, banks capital adequacy ratio and lending rate had negative and statistically significant effect whereas bank profitability measured in terms of ROA and effective tax rate had positive and statistically significant effect on NPLs of commercial banks in Ethiopia. The finding of this study is significant since once identifying the determinants of NPLs might enable management body to make appropriate lending policies that prevent the occurrence of NPLs. Furthermore, the study recommended as bank managers should emphasize the management of current assets and loans than fixed assets in order to reduce the level of nonperforming loans. Besides, it is better for the loan officers to provide financial counseling to the borrowers on the wise use of loan and also to make decision on timely fashion to meet their need.

Key words: *Nonperforming loans, bank specific factors, macroeconomic factors*

Acknowledgement

First of all, I would like to greatly express my utmost gratitude to my main advisor Wondwesen Siyum (Ass. professor) and co-advisor Muse Beyene (MSc) for their invaluable comments, encouragements and guidance in accomplishing this thesis and make it successful. Besides, I extend my gratitude to the staff members and management body of Commercial Banks' head office, National Bank of Ethiopia and Center of Statistical Agency for their cooperation with me via providing necessarily data. My immense gratitude also go to my staff members for their immeasurable assistance while doing this thesis.

Furthermore, my indebted gratitude expressed to all of my families for their encouragement in completing this research paper, especially for my mother Belaynesh Mamo.

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Acronym

AIB: - Awash International Bank

ALR: Average lending rate

ARDL: - Autoregressive Distributed Lag

ATM: - Automated Teller machine

BOA: - Bank of Abyssinia

CAR: - Capital Adequacy Ratio

CBB: - Construction and Business Bank

CBE: - Commercial Bank of Ethiopia

CBE- Commercial Bank of Ethiopia

CEMAC: - Central African Economic and Monetary Community

CEEC: - Central Eastern European Countries

CESEE: - Central, Eastern and south eastern European

CIT: - Corporate Income Tax

CPI: - Consumer Price Index

CSA: - Center of Statistical Agency

DB: - Dashen Bank

ETR: - Effective Tax Rate

GDP: - Gross Domestic Product

GMM: - Generalized Methods of Moments

IMF: - International Monetary Fund

INFR: - Inflation Rate

LTD: Loan to deposit

MENA: - Middle East and North Africa

NBE: - National Bank of Ethiopia

NIB: - Nib International Bank

NPL: -Nonperforming Loan

OLS: - Ordinary Least square

ROA: -Returns on Asset

ROE: -Return on Equity

SPSS: -Statistical Package for Social Sciences

UB: - United Bank

US: - United States

VIF: - Variance Inflation Factors

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, the research hypothesis those tested against the econometric results are presented. Lastly, the subsequent section presents significance of the study, scope and limitation of the study, and organization of the paper, ethical issues and operational definitions respectively.

1.1 Background of the Study

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.

Deposits in banks are offset by higher margins from creation of credits as loans. However, if such assets do not generate any income, the banks` ability to repay the deposit amount on the due date would be in question. Therefore, the banks with such asset would become weak and such weak banks will lose the faith and confidence of the customers. Ultimately, unrecoverable amounts of loans are written off as Nonperforming loan (Mallick *et al.,* 2010) as cited in Rawlin *et al.*(2012).

As many literatures shows, there have been an increased number of significant bank problems both at matured and emerging economies (Tendia *et al.* 2012). Banking sectors can perform worst as a result of inefficient management, low capital adequacy and poor assets quality. Non-performing assets is also the single largest cause of irritation of the banking sectors (Sontakke and Tiwari, 2013).

Deterioration in asset quality is much more serious problem of bank unless the mechanism exists to ensure the timely recognition of the problem. It is a common cause of bank failure. Poor asset quality leads nonperforming loan that can seriously damage a banks' financial position having an adverse effect on banks operation (Lafuente, 2012).

A lot of studies were conducted on the difficulty of nonperforming loans for banking sectors. For instance, the study of Calice (2012) for the Tunisian banking sectors found as banking sector suffer from decline in asset quality. In addition, Blanco and Gimeno (2010) for South African banks and Kolapo (2012) for the Nigerian banks, NPLs have an adverse effect on banking sectors survival. Thus, since nonperforming loans had an adverse effect on the banking sectors' survival, the cause for NPLs should be given due consideration. Its causes are different in different countries that might be due to situational factors such as the level of economic condition in which the banking sectors are operating and also bank level factors. Accordingly,

this issue attracted the interest of different researchers in different countries. That means a lot of studies are performed on the determinants of NPLs of financial sectors worldwide. For instance:-

Saba *et al.*(2012) made study on the determinants of NPLs on US Banking sector and found as lending rate had negative while inflation and Real GDP per capital had positive and significant effect on NPLs. Besides, Louzis *et al.*(2010) examined the determinants of NPLs in the Greek financial sector using dynamic panel data model and found as real GDP growth rate, ROA and ROE had negative whereas lending, unemployment and inflation rate had positive significant while loan to deposit ratio and capital adequacy ratio had insignificant effect on NPLs.

The study of Skarica (2013) on the determinants of NPLs in Central and Eastern European countries through fixed effect model was also found as GDP growth rate, unemployment rate and inflation had negative and significant impact on NPLs. Similarly, Carlos (2012) based on OLS model estimators found as NPLs have negative association with GDP growth rate whereas a positive association with unemployment rate. Besides, Moti *et al.* (2012), made study on the effectiveness of credit management system on loan performance and found as credit quality, interest rates charged, credit risk control and collection policies had an effect on loan performance in Kenya.

Similar to the Western and other African countries, in Ethiopia also Wondimagegnehu (2012) conducted a study on determinants of nonperforming loans and found as 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, and fund diversion for un expected purposes and overdue financing had an effect on the occurrence of NPLs. Even though as to the knowledge of the researcher, there is only a single study made by Wondimagegnehu (2012) in Ethiopia which is related with this title without considering macroeconomic factors except for bank specific factors.

Thus, given the unique features of banking sector and environment in which they operate and also rapid expansion of banking institutions in Ethiopia, there are strong wishes to conduct a separate study on the determinants of NPLs of banking sector in Ethiopia. Besides, inconsistent results in different studies among researchers are also another motive to conduct this study. To this end, the main objective of this study was to examine the bank specific and macroeconomic

determinants of NPLs of commercial banks in Ethiopia. This initiates the bank management and executives with applied knowledge on the management of identified variables and provides them with understanding of activities that will enhance their loan quality and play a vital role in filling gap in understanding the determinants of NPLs.

1.2 Statement of the Problem

Issues of Nonperforming Loans (NPLs) gained increasing attentions in the past few decades. Poor loan management will contribute to NPLs. It is critical issue for every bank to manage bad loans. Many countries are suffering from Nonperforming Loans (NPLs) in which banks are unable to get profit out of loans (Petersson and Wadman, 2004).If the loan is well managed; it will increase the bank's profitability and sustainability in the future. However, if failed to do so, it will be the major threat to their survival (MacDonald, 2006).

NPLs affect the bank`s liquidity and profitability which are the main components for the overall efficiency of the bank. An increase in NPLs provision diminishes income. Again, mismatch of maturities between asset and liability create liquidity risk for the banks that deteriorate bank`s overall credit rating including its image (Badar and Yasmin, 2013).Therefore, the determinants of NPLs should be given a due consideration because of its adverse effect on survival of banks.

The adverse effect of NPLs is attributable to bank managers' adverse selection of its borrowers (Brownbridge, 1998). NPLs are determined by different factors such as level of GDP, inflation , unemployment, volume of deposit, return on equity, return on asset, capital adequacy, total loan, liquidity, bank size, excessive lending, interest rate and credit growth. These factors are studied by different researchers in different countries (Mileris(2012), Tomak(2013), Ahmad and Bashir(2013), Shingjerji(2013) and etc.).

Though, there are a number of studies that are conducted at a global level to examine the determinants of NPLs, most of the studies were made with reference to developed countries like Italy, Spain, Greece, Europe and USA and the like. This means, they do not explain the issues for emerging market particularly for Ethiopian case.

The operation of modern and organized financial institution is the most crucial part for any country to ensure the economic growth and development. In case, financial sector of Ethiopian economy is dominated by banking sectors. So, it is important to examine their asset quality.

Further, by having a lot of literature on the determinants of NPLs of banks across worldwide, it is important to examine in Ethiopia case. This is due to the fact that, it is difficult to make generalization about the NPLs for the developing economy based on the result of developed economy without making any research. Besides, since the majority of bank assets are hold by loans, unless the determinants of NPLs are visualized to enhance the quality of asset, it is hard for the survival the banking sectors.

Generally, the basic motive for this study is that, different studies were done in Western Europe and East African countries (Saba *et al.* (2012), Louzis *et al.* (2010), Badar and Yasmin (2013) and Moti *et al.* (2012). However, the results of those studies were inconsistent. This inconsistency of results might be attributable to the method of data analysis used by different researchers and difference in the economic condition of the countries in which banking sectors are operating. For instance;

The study of Saba *et al.* (2012) on the title of "Determinants of Nonperforming Loan on US Banking sector" found negative significant effect of lending rate and positive significant effect of real GDP per capital and inflation rate on NPL via OLS regression model. Similarly, the study of Louzis *et al.*(2010) examined the determinants of NPLs in the Greek financial sector using dynamic panel data model and found as real GDP growth rate, ROA and ROE had negative whereas lending, unemployment and inflation rate had positive significant while loan to deposit ratio and capital adequacy ratio had insignificant effect on NPLs. However, Swamy (2012) examined the determinants of NPLs in the Indian banking sector using panel data and found as GDP growth rate, inflation, capital adequacy and bank lending rate have insignificant effect on NPLs.

Shingjergji (2013) who conducted study on "the impact of bank specific factors on NPLs in Albanian banks system" utilized OLS estimation model and found as ROE have significant negative on NPLs. However, Ahmad and Bashir (2013) conducted a study on the "Bank

Specific Determinants of Nonperforming Loan" by static panel data model and found as ROE has insignificant negative association with NPLs.

Makri *et al.*(2014) identify the factors affecting NPLs of Eurozone's banking systems through difference Generalized Method of the Moments (GMM) estimation. Accordingly, they found as ROA did not show any significant impact on NPL ratio. However, Selma and Jouini (2013) conducted a study on Italy, Greece and Spain for the period of 2004-2008 via panel data model and found a significant negative effect of ROA on NPLs. similarly, Boudriga *et al.* (2009) conducted a study on the title "Problem loans in the MENA countries via random-effects panel regression model and found as ROA has significant negative effect on NPLs.

In addition to the above facts, there has not been much research which is conducted to date on the determinants of NPLs in countries with emerging economy like Ethiopia except the study made by Wondimagegnehu(2012).The study of Wondimagegnehu (2012) was assessed the bank specific factors affecting NPLs via OLS estimation model by the help of SPSS software. However, this study considers both macroeconomic factors such as inflation rate, tax rate and lending rate and, bank specific factors like loan to deposit ratio, ROE, ROA and capital adequacy ratio as determinant factors of NPLs. Besides, fixed effect model and version 12 Stata software was used in this study to examine the determinants of NPLs of commercial bank in Ethiopia.

Accordingly, banking industry in Ethiopian has its own unique features that distinguish them from other countries financial market. One of the feature is the regulation of the country is not allowed foreign nations or organization to fully or partially acquire share of Ethiopian banks. Besides, there is no secondary market. Moreover, in the country, a rapidly growing industry is the banking sector. As a result, it is visible to conduct a study on the determinants of NPLs of commercial banks in Ethiopia which is crucial.

In light of the above facts and research gaps, the purpose of this study is to examine the determinants of NPLs of commercial banks in Ethiopia. To this end, this study tried to provide real information about the determinant factors affecting NPLs of commercial banks and feasible recommendation for the impact of identified variables on the levels of NPLs. Therefore, the researcher used panel data for the period 2002 to 2013 that obtained from NBE and CSA.

1.3 Objective of the Study

1.3.1 General objectives

The main objective of this study was to examine the determinants of nonperforming loan of commercial banks in Ethiopian.

1.3.2 Specific objectives

Specific objectives of the study were;

1. To examine the bank specific determinants of nonperforming loans (NPLs) of commercial banks in Ethiopia
2. To examine macroeconomic determinants of nonperforming loans (NPLs) of commercial banks in Ethiopia
3. To examine the trends of nonperforming loans (NPLs) of commercial banks in Ethiopia

1.4 Research Hypothesis

The purpose of this study is to examine the determinants of nonperforming loans (NPLs) of commercial banks in Ethiopia. The empirical studies made around the world demonstrate various outcomes on determinants of nonperforming loans of the financial sectors. From the review of empirical literature, the researcher perceived as there is no consistency in the results for the determinants of nonperforming loans. For instance,

From Ethiopian context, Wondimagegnehu (2012) on the title of "Determinants of Nonperforming Loans of Banking sector in Ethiopia" found as interest rate has no impact on the levels of NPLs via OLS regression model. However, the study of Saba *et al.* (2012) on the title of "Determinants of Nonperforming Loan on US Banking sector" found negative significant effect of lending rate and positive significant effect of real GDP per capital and inflation rate on NPL via OLS regression model. Similarly, the study of Louzis *et al.*(2010) examined the determinants of NPLs in the Greek financial sector using dynamic panel data model and found as real GDP growth rate, ROA and ROE had negative whereas lending, unemployment and inflation rate had positive significant while loan to deposit ratio and capital adequacy ratio had insignificant effect on NPLs. However, Swamy (2012) examined the determinants of NPLs in the Indian banking sector using panel data and found as GDP growth rate, inflation, capital

adequacy and bank lending rate have insignificant effect on NPLs. According to Shingjergji (2013) and Boudriga *et al.* (2009) ROA has significant negative effect on NPLs whereas Makri *et al.*(2014) found as ROA did not show any significant impact on NPL ratio.

In this section the researcher developed testable hypotheses to examine the relationship between bank specific and macroeconomic determinants nonperforming loans of commercial banks in Ethiopia. Thus, based on reviewed related literatures, the researcher developed the following null hypotheses to estimate the sign relationship of bank specific and macroeconomic determinants with nonperforming loans of commercial banks in Ethiopia based on empirical evidence reviewed in the literature parts. Since, the null hypothesis is the statement or the statistical hypothesis that is actually being tested (Brooks, 2008 p. 52), the following hypotheses are null hypotheses. Accordingly, the following hypotheses are tested.

H1. Loan to deposit ratio (LTD) has positive relation with Nonperforming loans banks.
H2.Return on asset (ROA) has negative relation with Nonperforming loans (NPLs) of banks.
H3.Return on equity (ROE) has negative relation with Nonperforming loans of commercial banks in Ethiopia.
H4.Capital adequacy ratio (CAR) has negative relation with Nonperforming loans (NPLs) of banks.
H5.Inflation rate (INF) has negative relation with Nonperforming loans (NPLs) banks.
H6. Lending rate (LR) has positive relation with Nonperforming loans (NPLs) of banks.
H7.Effective tax rate (ETR) has positive relation with Nonperforming loans (NPLs) banks.

1.5 Scope and Limitation of the Study

This thesis is adjusted to fit its objectives of examining the determinants of NPLs of commercial banks in Ethiopia within the limits of specified time and possibility. The researcher decided to limit this study to the commercial banks found in Ethiopia namely commercial bank of Ethiopia, Construction and business bank, Awash international bank, bank of Abyssinia, Wegagen bank, United bank, Nib International bank and Dashen bank that were registered by NBE before 2007/08. These banks were selected since they are senior banks and are expected to have more experience on the lending activities. Besides, this study considers bank profitability (ROA, and ROE), loan to deposit ratio, and capital adequacy ratio, lending rate, inflation rate, and effective

tax rate for the decision and analysis of data. To this end, this study covers a panel data of these banks over the period 2002 to 2013. Thus, this study is limited to both bank specific and macroeconomic determinants of NPLs of Commercial banks in Ethiopia between the above mentioned periods.

1.6 Significance of the study

The finding of this study which details with the determinants of nonperforming loan of commercial bank in Ethiopia is beneficial for different stakeholders such as Banking sectors(commercial Banks and National bank of Ethiopia),researcher and for other researchers as follows.

For National bank of Ethiopia, since such investigation has policy implication, the finding of this study might be used as a directive input in developing regulatory standards regarding the lending policies of commercial banks of Ethiopia. In addition, this study will initiate the commercial Bank management to give due emphasis on the management of these identified variables and provides them with understanding of activities that will enhance their loan performance. This is due to the fact that knowing the variables that determine the nonperforming loan will help the bank manager to concentrate on the quality of loan rather than its quantity. Thus, this study made the management body to visualize the determinants of NPLs.

Furthermore, the finding of this study initiates the researcher for further studies. Last but not least, this study serves as a reference for other researchers in related area. Thus, it can minimize the literature gap in the area of study particularly in Ethiopia.

1.7 Operational Definition

Loan and advances: any financial asset granted by banks to borrower on a contract of an obligation to repay the principal amount with usually its interest either on due date or demand
Nonperforming loans - 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/advances is in question and delayed for more than 90 days(NBE, 2008).
Credit risk – the risk arise as result when the borrower fail to conclude its financial contract according to the agreement with lender. It is an asset default by counter party.

Borrower: - the one who borrows money from the lender (Bank).

Lending: - provision of loan by one party (lender) to another party (Borrower)

Bank specific factors: - are variables that are under the control of bank management. They can be directly/ indirectly stated in the financial statements of banks.

Macroeconomic factors: - are variables in which the bank management has no power to control them. Rather, these variables are related with the fiscal and monetary policies of the country.

1.8 Ethical Issues

Almost all the financial institutions have strict policy implications on the confidentiality of their data. They can pay the ultimate price for the breach of this duty of confidentiality. Disclosing of information by employees to a third party can expose the institution to potential legal conflict. Due to this ethical issue, they are fearful in disclosure of such information. However, this fear was addressed by explaining the core of the study to the information providing agents with the assurance that the data will be handled professionally through formal letter. Therefore, before data collection, permission is obtained from the management body of all the selected commercial banks through formal letter. The formal letter was taken from Jimma University specifically from the research and graduate studies office of business and economics collage and then given to those bank managements and all other concerned office to undertake the tasks freely and confidentially.

1.9 Organization of the paper

This thesis is organized into five chapters. The first chapter starts with presenting background of the study, statement of the problem, objective of the study, significance of the study, scope and limitation of the study. The second chapter focuses on both theoretical and empirical review of related literature. The third chapter deals with the research methodology. Chapter four deals with the data analysis and presentation and the fifth chapter contain the conclusion and recommendation of the study including the direction for further study

CHAPTER TWO

REVIEW of RELATED LITERATURE

This chapter starts with 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 (cross countries and single country) are reviewed by focusing on determinants of NPLs are presented. Then after, the knowledge gaps from the reviewed literatures are outlined.

2.1 Theoretical Literature

This part of literatures has three sections. The first section discusses overview of banking system in Ethiopia. The second section presents bank lending by focusing on its definition, source and factors. Lastly, the issue of nonperforming loan is overviewed.

2.1.1 Overview of Banking System in Ethiopia

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 between1936-1941, 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. Then, on December 16, 1963 as per proclamation No.207/1955 of October 1963 commercial bank of Ethiopia control all commercial banking activities (Fasil and Merhatbeb, 2009).

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 0f August 2,

1980 to form single commercial bank in the country until the establishment of private commercial banks in 1994.To this end, 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. However, following the departure of Dergue regime, 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 (Habtamu, 2012).

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. This indicates as Ethiopia categorized under banked country with limited outreach(Tseganesh, 2012).Thus, currently number of banking sectors in Ethiopia were reached nineteen as shown it the following tables.

Table 2.1 *Banking sectors in Ethiopia*

N<u>o</u>	Name of Banks	Year of Establishment
1	Awash International Bank	1994 E.C
2	Commercial Bank of Ethiopia	1963 E.C.
3	Development Bank of Ethiopia	1901 E.C.
4	Construction and Business Bank	1975 E.C.
5	Dashen Bank	1995 E.C.
6	Wegagen Bank	1997 E.C.
7	Bank of Abyssinia	1996 E.C.
8	United Bank	1998 E.C
9	Nib International bank	1999 E.C.
10	Cooperative Bank of Oromia	2004 G.C.
11	Lion International Bank	2006 G.C.
12	Zemen Bank	2008 G.C
13	Oromia International Bank	2008 G.C.
14	Buna International Bank	2009 G.C.
15	Berhan International Bank	2009 G.C
16	Abay Bank S.C	2010 G.C
17	Addis International Bank S.C	2011 G.C
18	Debub Global Bank S.C	2012 G.C
19	Enat bank	2012 G.c

Source: www.nbe.et

2.1.2 Definition and Concepts

2.1.2.1Overview of Bank Loans and Lending

Commercial bank is a depository institution that is relatively unrestricted in its ability to make commercial loan and that is largely permitted to issue checking accounts. Commercial banks are the most important of all depository institution (Leroy and Vanhoos, 2006).They creates money

by through lending and purchasing securities (Thomas, 2006). Commercial banks extend credit to different types of borrowers for many different purposes.

One of the major functions of any commercial bank is providing loan to the business society. Banks collect money from those who have excess money and lend it to others who need money for different purpose. Therefore, banks' intermediary function plays a vital role in the economic activity. Banks accept customer deposits and use those funds to give loans to other customers or invest in other assets that will yield a return higher than the amount bank pays the depositor (McCarthy et al., 2010) cited in Zewdu (2010). It follows that customers' deposit is the primary source of bank loan and hence, increasing or guaranteeing deposits directly has a positive effect on lending. Therefore, bank credit is the primary source of available debt financing for most customers whereas good loans are the most profitable assets for banks.

The principal profit making activity of commercial banks is making loans to its customers. In the allocation of funds to earn the loan portfolio, the primary objective of bank management is to earn income while serving the credit needs of its community (Reed and Gill, 1989) cited in Zewdu (2010).Therefore, like all debt instruments, a loan entails the redistribution of financial assets over time, between the lender and the borrower. The borrower initially receives an amount of money from the lender to pays back, but sometimes not always in regular installments, to the lender. This service is generally provided at a cost, known as interest on the debt. As one of the principal duties of financial institutions is to provide loans, it is typically the main source of income to banks. Besides, bank loans and credit also constitute one of the ways of increasing money supply in the economy (Felix and Claudine, 2008).

Loans are the largest single source of income for banks. Bank loan involves personal relationships between the bankers and borrowers. It has a highest degree of default risk than other bank assets. Loans yield the higher rate of return among bank assets in compensation for lower liquidity and higher risk (Thomas, 2006). A loan composition greatly varies among banks based on their size, location, trade area and lending experts (MacDonald, 2006).

According to Zewdu (2010), lending is the provision of resources (granting loan) by one party to another. The second party doesn't reimburse the first party immediately there by generating a debt, and instead arranges either to repay or return those resources at a later date. Banks function

as financial intermediaries, collecting funds from savers in the form of deposit and then supplying to borrowers as loans. Those functions benefit both the banks and the borrowers.

Lending represents the heart of the industry and Loans are the dominant asset and represent 50-75 percent to total amount at most banks, generate the largest share of operating income and represents the bank`s greatest risk exposure (MacDonald, 2006).

2.1.2.2 Factors Affecting Bank Loan

According to Zewdu (2010), the sources of fund for lending are reserve, deposits and capital. All these sources may be affected by different factors and would have a direct influence on lending. Since lending is the principal function of banking industry, the management of banks should give due attention, analyze and take the necessary measures on time on internal and external factors that affect or limit lending. Without lending, banks' incomes especially interest income would highly deteriorate and affect bank survival. In case, since nonperforming loans (NPLs) has a direct reflection of poor asset quality, the factors that influence banks loans have their own impact on NPLs (Rawlin *et al.* 2012).

According to Reed and Gill (1989) cited in Zewdu (2010) therefore, the factors that influence bank loans, that might have their own impact on NPLs are:

Capital position: The capital of banks serves as a custom for protection of depositors' funds. The size of capital in relation to deposits influences the amount of risk that a bank can afford. Relatively large capital structure can make loans of longer maturities and greater credit risk.

Profitability: Some banks may emphasize earning more than others. Banks with greater need of earning might adapt more aggressive lending policies. An aggressive policy might call consumer loans, which normally are made at higher rates of interest than short-term loans.

Stability of deposits: - The fluctuation and type of deposit must be considered. After adequate provisions have been made for reserves, bank can then engage in lending. Even though, these reserves designed to take care of predictable deposit fluctuations and loan demands since unpredictable demand force banks to give consideration to the stability of deposits in formulating loan policy.

Economic conditions: - Stable economy is more conducive to a liberal loan policy than the one that is subject to seasonal and cyclical movements. Deposit of famine economies fluctuate more violently than deposit in an economy noted for its stability. Consideration must be given to the national economy. Factors adversely affect the nation as a whole may, if they are of serious magnitude, eventually affect local conditions.

Influence of monetary and fiscal policies: - If monetary and fiscal policies are expansive and additional, reserves are made available to the commercial banking system; the lending ability of banks is increased. Under these policies banks can have a more liberal loan policy.

Ability and experience of bank personnel:-The expertise of lending personnel is not insignificant in the establishment of bank loan policy. One of the probable reasons that banks were slow in entering the consumer lending field was the lack of skilled personnel.

Credit needs of the area served:- banks specialized experience on different types of loans e.g. Mortgage real-estate. The major reasons banks are chartered is to serve the credit needs of their communities. Banks are morally bound to extend credit to borrowers who present logical and economically sound loan requests.

According to Black and Daniel (1989) cited in Zewdu (2010) there are also other factors that affect bank lending and investing activities. These factors include:

The interest rate: represents rate of returns available from the various alternative lending and investing activities. Fundamental problem of bank management is achieving the proper balance between return and risk.

The liquidity of fund: - it is the amount of liquid funs tied up in varies lending and investing activities. To maintain adequate liquidity, bank must constantly guard against excessive losses from lending and investing activities. If bank made too many bad loans, the value of its asset could fall below the amount of its liabilities.

Tax: corporate income tax rate affect the bank loans in different aspects: one is that high tax burden enable the banks to shift the tax burden either by increasing lending rate and fees or paying low interest rate on deposits. The second aspect is that, corporate income tax rate has output and input substitution effect. The output substitution effect states that increased CIT rate represents a decrease in production in the incorporated sectors. In this case, the demand for loan gets lower whereas input substitution effect represents the substitution of equity with other inputs for instance; debt (Albertazzi and Gambacorta, 2006). Taxation in banking sectors represents the

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ability of banks to allocate its portfolios reduces its taxes. Bank is capable of transferring the tax costs to its customers by raising fees and interest spreads. The shifting of tax burden to customers through higher lending rate on loan and lowering interest rate on the deposit has a direct impact on the level of NPLs (Khan *et al.*2011). Besides, corporate entities shift their tax burden to other tax payers due to the existence of double taxation (Kaplow, 2008).

2.1.2.3Nonperforming Loans (NPLs)

There is no common definition of nonperforming loans (NPLs) in the whole country since it is recognized that it is possible that what is appropriate in one country may not be so in another. There is, however, some common opinion on this issue. Accordingly the IMF's Compilation Guide on Financial Soundness Indicators, NPLs is defined as:

> *"A loan is nonperforming when payments of interest and/or principal are past due by 90 days or more, or interest payments equal to 90 days or more have been capitalized, refinanced, or delayed by agreement, or payments are less than 90 days overdue, but there are other good reasons such as a debtor filing for bankruptcy to doubt that payments will be made in full"* (IMF, 2005).

Besides, 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" (NBE, 2008).*

Generally, NPLs are loans that are outstanding both in its principal and interest for a long period of time contrary to the terms and conditions under the loan contract. Any loan facility that is not up to date in terms of payment of principal and interest contrary to the terms of the loan agreement is NPLs. Thus, the amount of nonperforming loan measures the quality of bank assets (Tseganesh, 2012).

2.1.2.3.1 Five Cs of Nonperforming/Bad loans

As noted by MacDonald (2006), there are five Cs of bad credits that represent the issues used to guard against/prevent bad loans). These are:

Complacency: refers the tendency to assume that because of the things were good in the past, they will be good in the future. For instance, Assuming the past loan repayment success since things have always worked out in the past.

Carelessness: indicates the poor underwriting typically evidenced by inadequate loan documentation, lack of current financial information or other pertinent information in the credit files, and lack of protective covenants in the loan agreement. each of these makes it difficult to monitor a borrower`s progress and identify problems before they are unmanageable.

Communication ineffectiveness: inability to clearly communicate the bank`s objectives and policies. This is when loan problem can arise. Therefore, the bank management must clearly and effectively communicate and enforce the loan policies and loan officers should make the management aware of specific problems with existing loans as soon as they appear.

Contingencies: refers the lenders` tendency to play down/ignore circumstances in which a loan might in default. It focuses on trying to make a deal work rather than identifying down side risk.

Competition: involves following the competitors` action rather than monitoring the bank`s own credit standards.

Banks, however, still have required expertise, experiences, and customer focus to make them the preferred lender for many types of loan. Lending is not just a matter of making loan and waiting for repayment. Loan must be monitored and closely supervised to prevent loan losses (MacDonald, 2006).

2.2 Empirical Literature

This chapter provides so many evidences which identify the major determinants of bank loans, particularly, nonperforming loans. In case, some studies are conducted on particular country and the others on panel of countries. Hence many researchers have conducted a lot of study on determinants nonperforming loans (NPLs), due to its significance for the bank's failure. In case, the researcher starts reviewing empirical related literatures from the study made across country and then single country studies.

There are a plenty of variables that affect the NPLs of banking sectors. In this study, the researcher focused on both bank specific and macroeconomic determinants of NPLs of commercial bank in Ethiopia. Internal factors are caused by internal functions and activities of

bank, and are due to decisions and practices of officials and staff's functions. These factors are controllable in which the manager can prevents them through using suitable method, determination and elimination of weakness and improvement of process. Whereas, external factors can`t be controlled by bank managers and are caused by external environment including effect on implementation of decisions and also government policies. For instance; unexpected events, changing in rules and obligations, political and economic changes (inflation and slump) are external factors (Biabani *et al.*, 2012).

However, a variety of variables that got more attention and included in this thesis are loan to deposit ratio, capital adequacy/solvency ratio, profitability (ROA & ROE), lending rate and effective tax rate.

2.2.1. Across Countries Studies

Boudriga *et al.*(2009) conducted a study on the title "bank specific determinants and the role of the business and the institutional environment on Problem loans in the MENA countries" for 2002-2006 periods. They employed random-effects panel regression model for 46 countries. The variables included were credit growth rate, Capital adequacy ratio, real GDP growth rate, ROA, the loan loss reserve to total loan ratio, diversification, private monitoring and independence of supervision authority on nonperforming loans. The finding revealed that credit growth rate is negatively related to problem loans. Capital adequacy ratio is positively significant justifying that highly capitalized banks are not under regulatory pressures to reduce their credit risk and take more risks. Also ROA has negative and statistically significant effect on NPLs. This result supports as greater performance measured in terms of ROA reduces nonperforming loans since reduced risk taking in banks exhibiting high levels of performance.

Skarica (2013) also 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 *et al.*(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.

Djiogap and Ngomsi (2012) were investigates the determinants of bank long-term loan in the Central African Economic and Monetary Community (CEMAC). They used the panel data of 35 commercial banks from six African countries over the period 2001-2010. They used fixed effect model to examine impact of bank size, GDP growth and capital adequacy ratio on NPLs. The study found negative significant impact of CAR on the level of NPLs. Their finding justifies as more diversified banks and well capitalized banks are better able to withstand potential credit. However, inflation variable is statistically insignificant in explaining the total business loans ratios of banks.

2.2.2. Single Country Studies

One of the studies in this regard is that of Sakiru *et al.(*2011) on macroeconomic determinants of nonperforming loan on banking system in Malaysia. Their study was covered bank`s data for monthly time series of 2007:1 to 2009: 12 period. In the study, lending rate, producer price and industrial production index were used as macroeconomic variables that affect the NPLs. The study utilized ARDL approach and the finding reveals that lending rate has a significant positive effect on NPLs and justifies that, during the period of high lending rate, NPLs is anticipated to increase causing a rise in the rate of default by borrowers.

Hyun and Zhang (2012) investigated the impact of macroeconomic and bank-specific factors of nonperforming loans in US for two distinct sub-sample periods that is from 2002-2006 (pre financial crisis) and 2007-2010(during financial crisis).The variables included both macroeconomic factors namely GDP growth rate, unemployment rate and lending rate, and bank specific variables such as Return on Equity (ROE), solvency ratio, inefficiency, bank size and non-interest income. In pre financial crisis period, the study found as solvency ratio, ROE, lending rate, GDP growth rate and unemployment rate negatively affect NPLs. Negative effect of lending rate on NPLs implies that an increase in lending rate curtail peoples' /business entity's' ability to borrow, which decreases the amount of loan and then reduce NPLs. Beside, statistically significant and negative solvency ratio effect on NPLs, implies that the higher the Solvency ratio,

the lower the incentives to take riskier loan policies, and consequently, reduce the amount of problem loans. However, bank size has no effect. During financial crisis also solvency ratio, GDP growth rate, unemployment rate and ROE all have a negative impact on NPLs while lending rate has no significant effect on NPLs. Size allows for more diversification opportunities as larger banks can compose less concentrated portfolios that include borrowers from different industries, geographical Locations, capital size and other customer segments.

Tomak (2013) conducted study on the "Determinants of Bank's Lending Behavior of commercial banks in Turkish" for a sample of eighteen from 25 banks. The main objective of the study was to identify the determinants of bank`s lending behavior. The data was covered2003 to 2012 periods. The variables used were size, access to long term funds, interest rates, GDP growth rate and inflation rate. The finding reveals that bank size, access to long term loan and inflation rate have significant positive impact on the bank`s lending behavior but, interest rates and GDP are insignificant.

Besides, 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 from2006-2011in 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.

Ali and Iva (2013) who conducted study on "the impact of bank specific factors on NPLs in Albanian banking system" considered Interest rate in total loan, credit growth, inflation rate, real exchange rate and GDP growth rate as determinant factors. They utilized OLS regression model for panel data from 2002 to 2012 period. The finding reveals a positive association of loan growth and real exchange rate, and negative association of GDP growth rate with NPLs. However, the association between interest rate and NPL is negative but week. And also inflation rate has insignificant effect on NPLs.

Similarly, 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, Mileris (2012) on the title of "macroeconomic determinants of loan portfolio credit risk in banks" was used multiple and polynomial regression model with cluster analysis, logistic regression, and factor analysis for the prediction. The finding indicates that NPLs are highly dependent of macroeconomic factors.

However, 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.

Similarly, Farhan *et al.*(2012) on the title of "Economic Determinants of Non-Performing Loans: Perception of Pakistani Bankers" utilized both primary and secondary data in 2006 years. The data was collected from 201 bankers who are involved in the lending decisions or handling non-performing loans portfolio. Correlation and regression analysis was carried out to analyze the impact of selected independent variables. The variables included were interest rate, energy crisis, unemployment, inflation, GDP growth, and exchange rate. The study found that, interest rate, energy crisis, unemployment, inflation and exchange rate has a significant positive relationship whereas GDP growth has insignificant negative relationship with the non-performing loans.

According to an Empirical Study made on Commercial Banks in Pakistan by Badar & Yasmin(2013) on the title of "Impact of Macroeconomic Forces on Nonperforming Loans" the long and short run dynamics between nonperforming loans and macroeconomic variables covering the period from 2002 -2011 of 36 commercial banks in Pakistan were assessed. In the stud, inflation, exchange rate, interest rate, gross domestic product and money supply were included as macroeconomic variables. They applied vector error correction model. The study found that as there is strong negative long run relationships exist of inflation, exchange rate, interest rate, gross domestic product and money supply with NPls.

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Ranjan and Chandra (2003) analyze the determinants of NPLs of commercial banks' in Indian in 2002. The objective of the study was to evaluate how NPLs influenced by financial and economic factors and macroeconomic shocks. In the study, they utilized panel regression model and found that lending rate also have positive impact on the NPLs justifying that the expectation of higher interest rate induced the changes in cost conditions to fuel and further increase in NPLs. Besides, loan to deposit ratio had negative significant effect on NPls justifying that relatively more customer friendly bank is most likely face lower defaults as the borrower will have the expectation of turning to bank for the financial requirements.

Besides, Daniel and Wandera (2013) conducted the study on the effects of credit information sharing on the nonperforming loan of commercial banks in Kenya. The objectives of the study was to assess the impact of credit information sharing on nonperforming loans, to identify the factors that account for bad loans and to determine the economic sector that records higher bad loans and the efforts taken to reduce the risk in this sector. Data was collected from primary sources and secondary data between 2007 to 2012 period. The variables included in the study were Information Asymmetry; Interest/lending rates, Management of loans and legal framework and Credit Criteria. The study found as lending rates has positive significant effect on NPLs. It justifies as these causes make many borrowers not to pay their loans hence leading to many bad loans.

Similarly, Joseph (2011) who conducted study on the title of effects of interest rate spread on the level of non-performing assets of commercial banks in Kenya was considered interest rate spread/cost of loan as independent and NPLs ratio as dependent variables. The study applied descriptive research design. Both primary and secondary data were considered from 43 commercial banks in 2010. It was analyzed by the help of SPSS software. The finding indicates that cost of loan/lending rate has a positive significant effect on the occurrences of NPLs. However, Konfi (2012) who conducted study on the determinants of nonperforming loans on the operations of SINAPI ABA TRUST microfinance institutions in Ghana found as high interest rate was not significant factors causing the incidence of NPLs. This study justifies as interest rate is only applicable to loan defaulters who have managed to pay off outstanding principal and are in default in only interest payment. If a borrower is in default of both principal and interest, then one cannot assert that high interest rate is the actually the cause of the loan default.

Besides, the study conducted in Ethiopia by Wondimagegnehu(2012) on "the determinants of Nonperforming loan on commercial banks of Ethiopia" also found as 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 defaults by borrower and their knowledge limitation, fund diversion for un expected purposes and overdue financing has significant effect on NPLs. Besides, the study of Wondimagegnehu (2012) considers interest rate as bank specific factors and revealed as interest rate has no impact on the level of NPLs of commercial banks in Ethiopia.

2.3 Conceptual Frame Work

The main objective of this study is to examine the determinants o NPLs of commercial banks in Ethiopia. Based on the objective of the study, the following conceptual model is framed. As previously discussed in the related literature review parts, nonperforming loans are affected by both bank specific and macroeconomic factors. Bank specific factors are profitability, capital adequacy ratio, liquidity, diversification, bank size, 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 defaults by borrower and their knowledge limitation, and overdue financing deposit rate, and capital structure; whereas macroeconomic factors are interest/lending rate, inflation rate, public debt, exchange rate, money supply (Farhan *et al.*(2012), Shingjergji(2013), Sakiru *et al.* (2011), Ahmad &Bashir (2013), Saba *et al.* (2012), Louzis *et al.* (2010), Shingjergji (2013), Swamy (2012), Badar & Yasmin(2013), Ranjan & Chandra(2003) and Wondimagegnehu (2012)).

Thus, the following conceptual model is framed to summarize the main focus and scope of this study in terms of variables included. The blue color part represents the dependent variables used in this study.

Figure 2.1 *Conceptual framework*
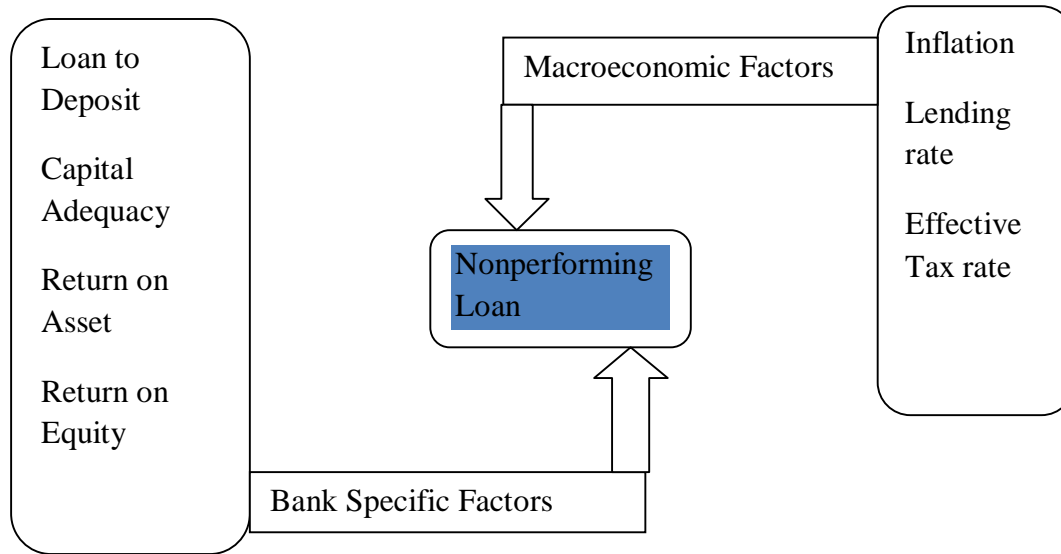
Source: extracted by the researcher (2014)

2.4. Summary and Knowledge Gap

This chapter was presented the theoretical foundation on bank loan and the banking industry in Ethiopia. In case, Ethiopian current banking system is dominated by the private banks that are entering to the industry in recent years. The other issues discussed in this chapter is bank definition and concepts of loan and lending, factors affecting bank loan and sources and allocations of funds in the banking industry. Further, factors that limit lending such as capital position, profitability, stability of deposits, economic condition, monetary and fiscal policies that have their own impact on NPLs were discussed in detail. Lastly, Nonperforming loan issues including its five Cs were discussed. Besides, Empirical studies regarding the determinants of nonperforming loan were also discussed. Then, the Knowledge gap is identified and conceptual frame work is developed by the researcher.

There are a plenty of variables that affect the NPLs of banking sectors. In this study, the researcher focused on both bank specific and macroeconomic determinants of NPLs of commercial bank in Ethiopia. Internal factors are caused by internal functions and activities of bank due to decisions and practices of officials and staff functions. These factors are controllable in which the manager can prevents them through using suitable method, determination and elimination of weakness and improvement of process. Whereas, external factors can`t be

controlled by bank managers and are caused by external environment including effect on implementation of decisions and also government policies. These factors are policy (monetary and fiscal) related factors. For instance; unexpected events, changing in rules and obligations, political and economic changes (inflation and collapse) are external factors (Biabani *et al*. 2012).However, the variables that got more attention and included in this thesis were loan to deposit ratio, capital adequacy/solvency ratio, profitability (ROA & ROE), lending rate and effective tax rate.

A plenty of studies were done on determinants of NPLs in different countries. Even though, the determinants of NPLs are still debatable among different researchers that might be due to situational factors like country level factors, bank level factors and the condition of legal and regulatory framework of the country. Thus, these debates can only be resolved through quantitative analysis on the determinants of NPLs.

Besides, most of the related literatures reviewed cover different studies made both in developing and developed countries' banking industries. Even if quite numbers of studies have investigated on the determinants of NPLs, most of these studies have been done in developed countries with few being done in developing countries. Thus, as to the knowledge of the researcher, there is still limited number of literatures in Ethiopian banking industry, with the exception of a single study made by Wondimagegnehu (2012) on the determinants of NPLs of banking industry in Ethiopia. Hence, this previously done study by Wondimagegnehu (2012) utilized only bank specific factors. Wondimagegnehu (2012) considers interest rate as bank specific factors and revealed as interest rate has no influence on the level of NPLs.

Furthermore, bank profitability and capital adequacy ratio that considered as basic determinants of NPLs were not included in his study since these variables are widely used by different researchers. Besides, even if taxation is not used in further study before, the researcher add as one of the determinant factors of NPLs in this study based on theoretical literatures and its sensitivity in the country specifically in Ethiopia. Likewise due to rapid expansion of banking institution in Ethiopia, it is better to conduct this investigation to ensure their continuous operation.

This study therefore, seeks to fill this gap by establishing the link between nonperforming loans and its determinants (bank specific and macroeconomic factors) in case of commercial banks in Ethiopia.

CHAPTER THREE

RESEARCH METHODOLOGY

This study aims to examine the determinants of NPLs in the 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. The subsequent section presents and discusses method of data process and analysis. Finally, definition of study variables with their measurement and model specifications are presented.

3.1 Research Design and Approach

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). Since this study was designed to examine the relationships between NPLs and its determinants, a logical reasoning either deductive or inductive is required. Deductive reasoning starts from laws or principles and generalizes to particular instance whereas inductive reasoning starts from observed data and develops a generalization from facts to theory. Besides, deductive reasoning is applicable for quantitative research whereas inductive reasoning is for qualitative research. Thus, due to quantitative nature of data, the researcher used deductive reasoning to examine the cause and effect relationships between NPLs and its determinants in this study.

As noted by Kothari (2004), explanatory research design examines the cause and effect relationships between dependent and independent variables Therefore, since this study was examined the cause and effect relationships between nonperforming loans and its determinant, it is an explanatory research.

The objective to be achieved in the study is a base for determining the research approach for the study. In case, if the problem identified is factors affecting the outcome having numeric value, it is quantitative approach (Creswell, 2003). Therefore, the researcher employed quantitative

research approach to see the regression result analysis with respective empirical literatures on the determinants of Nonperforming loans. Thus, the researcher was used a panel data from 2002 to 2013 period.

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 individual-specific variables. Besides, by combining time series and cross-section observations, it gives more informative data. Furthermore, panel data can better detect and measure effects that simply cannot be observed in pure cross-section or pure time series data (Gujarati, 2004).

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 et al (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 commercial banks in Ethiopia. These data includes both bank specific and macroeconomic factors. The bank specific which was obtained from the country's central bank, National bank of Ethiopia, which regulates the banking sector of the country and the head office of each selected commercial banks whereas one of macroeconomic variable was collected from the central statistical agency (CSA).

3.3 Sampling Design

Sample design deals with sample frame, sample size and sampling technique. Sampling is a technique of selecting a suitable sample for the purpose 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 to June of 2013, there are nineteen banks in Ethiopia. These are commercial bank of Ethiopia(CBE), Construction and Business bank(CBB), Awash international bank(AIB), bank of Abyssinia(BOA), Wegagen bank(WB), United bank(UB), Nib international bank(NIB), Dashen

bank(DB), Development bank of Ehtiopia, Cooperative bank of Oromia, Lion international bank, Zemen bank, Oromia international bank, Buna international bank, Berhan international bank, Abay bank S.C, Addis international bank S.C, Debub global bank,S.C and Enat banks. However, from all the above listed banks, Development bank of Ethiopia is not Commercial bank (www.nbe.et).

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 Commercial banks in Ethiopia. Second, those commercial banks should operate before 2007/08 having financial statements for consecutive twelve years.

Therefore, the data for this study was collected from eight commercial banks in the country. Out of the eight commercial banks, commercial bank of Ethiopia(CBE) and Construction and business bank(CBB) are state owned banks whereas the remaining six banks:-Awash international bank(AIB), bank of Abyssinia(BOA), Wegagen bank(WB), United bank(UB), Nib International bank(NIB) and Dashen bank(DB) are private banks that were registered before 2007/08 by NBE.

This is due to the fact that since the primary aim of this study is to examine the determinants of nonperforming loans of 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. Further, lending is not a one night process rather it comes by making operation for some consecutive years since the bank should have to accept deposit to grant loans to reach stage of suffering from poor asset quality.

Thus, as one can understand from objective of the study, the researcher aimed to examine the determinants of nonperforming loans of 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 2007/08 and after2007/08 year. And also based on whether they are commercial

banks or not. Accordingly, this study focused on all banks that were established to give commercial banking services only and those operate before 2007/08. Thus, the researcher used 12 years data of selected commercial banks that provide financial statements consecutively from 2002-2013periods.

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 eight experienced commercial bank in Ethiopia from nineteen banks in the country.

3.4 Data Analysis and Presentation

 As noted by Kothari (2004), data has to be analyzed in line with the purpose of the research plan after data collection. Accordingly, secondary data collected from NBE, CSA and head office of each respective bank were analyzed to determine its suitability, reliability, adequacy and accuracy. Thus, this study utilized both descriptive and econometric analysis based on a panel data from 2002-2013 to examine the relationship between the NPLs and its determinant factors in commercial banks found in Ethiopia. The data collected from different sources were coded, checked and entered to simple excel program to make the data ready for analysis. Then the collected data was processed and analyzed through STATA version 12 software packages.

For descriptive analysis; table and percentage were used to analyze the data. Besides, results of the descriptive statistics such as mean, standard deviation, minimum and maximum values were reported to describe the characteristics of variables under investigation. Furthermore, various diagnostic tests such as normality, heteroscedasticity, autocorrelation and multicolinearity test were conducted to decide whether the model used in the study is appropriate and to fulfill the assumption of classical linear regression model. Thus, in order to examine the possible degree of Multicolinearity among variables, correlation matrixes and variance inflation factor were used.

To this end, the researcher used fixed effect regression model analysis to examine the effect of each explanatory variable on nonperforming loans of commercial bank in Ethiopia. Thus, regression results were presented in a tabular form with the appropriate test statistics and then an explanation of each parameter were given in line with the evidence in the literature.

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, profit, lending rata and effective tax 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

Nonperforming Loan

Nonperforming loans (NPLs) are loans that are outstanding both in its principal and interest for a long period of time contrary to the terms and conditions under the loan contract. Any loan facility that is not up to date in terms of payment of principal and interest contrary to the terms of the loan agreement is NPLs. Thus, the amount of nonperforming loan represents the quality of bank assets (Tseganesh, 2012).

According to the Ethiopian banking regulation, "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" (NBE, 2008). NPL is a loan that delays for the payment of principal and interest for more than 90 days. Deterioration in asset quality is much more serious problem of bank unless the mechanism exists to ensure the timely recognition of the problem. It is a common cause of bank failure. Poor asset quality leads nonperforming loan that can seriously damage a banks' financial position having an adverse effect on banks operation (Lafunte, 2012).It distresses the performance and survival of banks (Mileris, 2012).It is measured or indicated by the amount of NPLs to gross loans.

NPL ratio= $\underline{\text{NPLs}}$
Gross loan

3.5.2 Independent Variables

Independent variables are explanatory variables that explain the dependent variables. In case, independent variable included in this study are indictors of bank profitability (ROA and ROE), solvency/capital adequacy ratio (CAR), loan to deposit ratio (LTD), lending rate(LR),inflation rate(IFR), and effective tax rate(ETR). Majority of these variables are modified and adopted from previously done studies based on the extent of their effect on nonperforming loan whereas one of these variable, that is effective tax rate is added from the researcher's own perception.

Bank Profitability

Bank profitability may reflect the risk taking behavior of bank managements. Banks with high profitability are less over stressed for revenue creation and thus less forced to engage risk credit offering. However, inefficient banks are more likely to experience high level of problem loans since they are tempted to grant and to engage in more uncertain credits to defend their profitability and meet the prudential rules imposed by monetary authorities (Boudriga *et al.* 2009). Poor management can imply week monitoring for both operating cost and credit quality of customers, which will include high levels of capital losses (Haneef *et al.* 2012).Thus, both ROA and ROE are considered as profitability indicators of bank in this study.

Return on Asset (ROA): represents efficiency in asset utilization and shows how much net income is generated out of assets. It indicates the ability of bank management to generate profits by utilizing the available assets of the bank. Thus, if the ratio of ROA is high, it indicates that it is better performance in order to generate profit. Strong bank profitability measured in terms of ROA might result from high lending rate, fees and commission that lead bank growth in size and profitability. Thus, ROA gives an idea as to how efficient management is at using its assets to generate earnings.

Different researchers found different results regarding the relationship between ROA and NPLs. For instance: - Ahmed and Bashir (2013) and Makri *et al.*(2014),) were examined positive significant relationships between ROA and NPLs. However, Boudriga *et a.,* (2009) and Selma

and Jouini (2013) found negative association between NPLs and ROA by supporting the arguments that states deterioration of profitability ratio measured in terms of ROA leads to riskier activities of banks and then raise the level of NPLs. They justified that since ROA represents efficiency in asset utilization, poor utilization of assets leads higher NPLs for the banks. Thus, this ratio is expected to have negative relationships with NPLs in this study. It is measured by the ratio of net profit to total asset as follows;

$$ROA = \frac{Net\ profit}{Total\ asset}$$

Return on Equity (ROE): represents the rate of return received from equity invested in banks. It is the amount of net income returned as a percentage of shareholders equity. Return on equity measures profitability by revealing how much profit a bank can generates with the money shareholders have invested. Thus, ROE measures how much the bank is earning on their equity investment. Many researchers were found different results between NPLs and bank profitability measured in terms of ROE. For instance:-Shigjerji(2013) and Ahmed and Bashir (2013) and Makri *et al*.(2014)found negative relationships between ROE and NPLs. Therefore, this ratio is expected to have negative relationships with NPLs. It is measured by the ratio of net profit to total equity.

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

Capital Adequacy Ratio (CAR)

Capital adequacy is a measure of bank`s financial strength since it shows the ability to withstand/tolerate with operational and abnormal losses. It also represents the ability to undertake additional business (Habtamu, 2012). As noted by Makri *et al*.(2014), CAR determines risk behavior of banks. It is a measure of banks solvency and ability to absorb risk. Thus, this ratio is used to protect depositors and promote stability and efficiency of financial systems. According to Makri *et al*.(2014), there is negative relationship with NPLs indicating a risky loan portfolio is marked by a high NPL (equivalent to high credit risk). However, Djiogap and Ngomsi (2012) found positive association between NPLs and capital adequacy ratio. It is

measured by total Equity to total asset ratio. However, it is expected to have negative association with NPLs in this study. This implies that well capitalized banks are less incentive to take risk.

$$CAR = \frac{\text{Total Equity}}{\text{Total Asset}}$$

Loan to deposit (LTD) Ratio

Loan to deposit (LTD) ratio examines bank liquidity by measuring the funds that a banks has utilized into loans from the collected deposits. It demonstrates the association between loans and deposits. Besides, it provides a measure of income source and also measures the liquidity of bank asset tied to loan (Makri *et al.*2014)). This ratio also measures customer friendliness of banks implies that relatively more customer friendly bank is most likely face lower defaults as the borrower will have the expectation of turning to bank for the financial requirements (Ranjan and Chandra, 2003). Thus, it represents a bank's preference for credit. It is credit culture that represents a bank's preference for credit. It is measured in terms of loan to deposit ratio. There is empirical evidence that shows as LTD ratio has significant effect on the level of NPLs of banking sectors in different aspects. In this study, this ratio is expected to have positive relation with NPLs.

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

Lending Rate/Interest Rate

Lending rates are one of the primary economic determinants of NPLs. It is the cost of borrowed funds. Interest rate spread is a measure of profitability between the cost of short term borrowing and the return on long term lending. Interest rate spread affect performing assets in banks as it increases the cost of loans charged on the borrowers (Joseph, 2011). Interest rate is the price a borrower pays for the use of money they borrowed from the lenders. Interest can be thought of as rent of money.

Thus, lending rate is a rate of return usually remains in admittance of monetary regulators (NBE) to manipulate the pursuance of monetary objectives. In case, maximum and minimum lending rate is set by NBE.

There is empirical evidence showing a positive and negative association between lending rate and NPLs. For instance: - Saba *et al.*(2012) found negative association between lending rate and NPLs whereas Farhan *et al.*(2012) and Ranjan and Chandra (2003)found as there is a positive relationship with NPLs and lending rate since an increase in interest rate curtails the paying capacity of the borrowers. Thus, lending rate is expected to have positive association with NPLs in this study. Accordingly, this study considers average lending rate (average of Minimum and Maximum Lending Rate) as proxy of lending rate as being commonly used by commercial banks for pricing loans.

Inflation Rate

It is a situation in which the economies overall price level is rising. It represents sustained and pervasive increament in aggregate price of goods and services resulting decline in purchasing power of money. Accordingly, when inflation is high and unexpected, it can be very costly to an economy. At the same time, inflation generally transfers resources from lender and savers to borrowers since borrowers can repay their loans with birr that are worthless. It is determined as the general consumer price index. This indicates that, as inflation increase, the cost of borrowing gets more expensive and deteriorates the quality of loan portfolio.

There are ambiguous results regarding the relationship between NPLs and inflation rate. According to Farhan *et al.*(2012), Skarica(2013), Klein(2013) and Tomak(2013) found as there is a positive relationship between NPLs and Inflation rate.Theoretically, inflation should reduce the real value of debt and hence make lending easier. However, high inflation may pass through to nominal interest rates, reducing borrowers' capacity to repay their debt. Through its attraction with the tax system, it can increase tax burden by artificially increasing income and profits. Besides, inflation cause firms to increase their costs of changing prices. Finally, it made individuals to hold less cash and make more trips to banks since inflation lowers the real value of money holdings. It can negatively affect the borrowers' real income when wages are stick. Besides, price stability is considered as prerequisites for ones' countries economic growth (Skarica, 2013).

Thus, Consumer price index is used in this study as the proxy of inflation since most ample measure of inflation defines a change in the price of consumer goods and services purchased by

households. Increase in CPI requires monetary regulators to use contractionary measures by increasing the interest rate to control inflation which later increase the cost of borrowing and ultimately cause NPLs. Keeping this information in mind, the relationship between NPLs and inflation is expected to be negative for this study. In case, the figure amount of CPI was taken from CSA.

Effective Tax Rate

Taxation in banking sectors represents the ability of banks to allocate its portfolios for its taxes. Corporate income tax rate affect the bank loans in different aspects. High tax burden enable the banks to shift the tax burden either by increasing lending rate and fees or paying low interest rate on deposits (Albertazzi and Gambacorta, 2006). Thus, bank is capable of transferring the tax costs to its customers by raising fees and interest spreads (Khan *et al*.2011). Bank with high debt pay less taxes due to higher interest expense. Accordingly, even if there is no specific study conducted using taxation as a determinant factor of NPLs, this study expects positive relationships between tax rate and NPLs. Generally, expected Sign of Variables are presented in table 3.1 as follows.

Table 3.1: *Expected Sign (+/-) of Explanatory Variables in this Study*

Explanatory Variables	Expected Sign	Some empirical evidence
Loan to Deposit Ratio	+	Swamy (2012)
Capital Adequacy Ratio	-	Shingjerji(2013),Hyun&Zhang(2013), Makri *et al*.(2014), Klein(2013)
Return on Asset	-	Swamy(2012), Selma and Jouini(2013), Bougriga *et al*. (2009)
Return on Equity	-	Makri *et al*.(2014), Klein(2013), Shingjerji(2013)
Lending Rate	+	Farhan *et al*.(2012), Sakiru *et al*(2011)
Inflation Rate	-	Farhan *et al*.(2012), Skarica(2013), Klein(2013), Tomak(2013)
Effective Tax Rate	+	-

sources: Swamy (2012), Shingjerji(2013), Hyun&Zhang(2013), Makri et al.(2014), Klein(2013), Selma and Jouini(2013), Makri et al.(2014), Klein(2013), Farhan et al.(2012), Sakiru et al(2011) and other studies included in the study.

Notes: A positive sign "+" indicates direct impact; whereas a negative sign "–" indicates an inverse impact of explanatory variables on dependent variable.

3.6 Model Specification

The aim of this study is to examine the determinants of NPLs of commercial banks in Ethiopia. Similar to the most noticeable previous research works conducted on the nonperforming loans of financial sectors, this study used nonperforming loans ratio as dependent variables whereas Loan to deposit ratio, capital adequacy ratio, return on asset, return on equity, Average lending rate, inflation rate and effective tax rate as explanatory variables. These variables were chosen since they are widely existent for the commercial bank in Ethiopia. Accordingly, this study examined the determinants of NPLs of commercial banks in Ethiopia by adopting a model that is existed in most literature. The regression model which is existed in most literature has the following general form;

$$Yit= \beta o + \beta X_{it} + \varepsilon_{it}$$

Where: - Y_{it} is the dependent variable for firm 'i' in year 't', β_0 is the constant term, β is the coefficient of the independent variables of the study, X_{it} is the independent variable for firm 'i' in year 't' and ε_{it} the normal error term.

Thus, this study is based on the conceptual model adopted from Fawad and Taqadus (2013). Accordingly, the estimated models used in this study are modified and presented as follow;

$$NPL_{it}= \beta_0 +\beta_1(LTD)_{it} + \beta2(CAR)_{it}+ \beta3(ROA)_{it}+\beta_4(ROE)_t+ \beta_5(ALR)_{it}+ \beta_6(INFR)_{it}+ \beta7(ETR)_{it}+\varepsilon_{it}$$

Where;

- β_0 is an intercept
- $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, {}_{and} \beta_7$ represent estimated coefficient for specific bank *i* at time *t* ,
- LTD,CAR, ROA, ROE, ALR, INF and ETR represent Loan to deposit ratio, capital adequacy/Solvency ratio, return on asset, return on equity, Average lending rate, inflation rate and effective tax rate respectively
- ε_{it} represents error terms for intentionally/unintentionally omitted or added variables. It has zero mean, constant variance and non- auto correlated. The coefficients of explanatory variable were estimated by the use of ordinary least square (OLS) technique.

CHAPTER FOUR

FINDING and DISCUSSIONS

Summary: 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 Stata 12 version. The first section of this chapter was mainly start with the explanation for study variables and discussion for the result of descriptive statistics including trend analysis for nonperforming loans (NPLs) of 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 Introduction

The determinants of NPLs of banking sectors have been studied by many researchers across the world. However, the literature lacks more evidence regarding Ethiopian context. Thus, this study was conducted to examine the determinants of NPLs of commercial banks in Ethiopian context to contribute its own effort for the empirical evidence. The banks that are included in this study were all senior commercial banks those operate before 2007/08. In case, the data for this study was drawn from eight commercial banks for 2002 to 2013 periods. To this end, 96 observations were analyzed to examine the determinants of NPLs of Commercial banks in Ethiopia.

4.2 Study Variables

This study was examined both macro and bank specific determinants of NPLs. Bank specific variables were drawn from financial statement of banks that are taken from the NBE and head office of each commercial bank whereas macroeconomic factors were taken from CSA except Effective tax rate that calculated from banks' financial statements. As stated in previous chapters, NPL is dependent variables whereas loan to deposit ratio, return on equity, return on asset, capital adequacy ratio, lending rate, inflation and effective tax rate are an explanatory in this study. In case, measurements and explanations of the above mentioned variables are presented in the following table 4.1 as follows:

Table 4.1 *Explanation of Study Variables*

Variables	Explanations
Nonperforming loan ratio(NPLs)	*Calculated as nonperforming loan to gross loan*
Loan to deposit (LTD)	*Calculated as total loan to total deposits*
Capital adequacy ratio(CAR)	*Calculated as total Owner's equity to total asset*
Return on equity(ROE)	*Calculated as net profit to owner's equity*
Return on asset (ROA)	*Calculated as net profit to total asset*
Average lending rate(ALR)	*Calculated as the summation of minimum and maximum lending rate divided by two*
Inflation(INF)	*Calculated as consumers price index*
Effective Tax Rate (ETR)	*Calculated as Tax to net income before tax*

Source: own computation from the financial statements (NBE) and CSA.

4.3 Descriptive Statistics

This section presents the descriptive statistics of dependent and explanatory variables used in this study. The dependent variable used in this study was NPLs ratio while explanatory variables are LTD, ROE, ROA, CAR, ALR, INF and ETR. Accordingly, the following table 4.2 reports mean, maximum, minimum, standard deviation and number of observation for each variables used in this study. In case, the following table 4.2 shows that all variables except for NPLs ratio have 96 observations. As noted by Yuqi Li (2006), the presences of missing value for some variables reduce the total observations for that variable. Thus, due to the missing value of NPLs for one year, NPLs have 95 observations implying missing reported figure. That means, NPLs missed one observation. Thus, mean, standard deviation, minimum and maximum values of both dependent and explanatory variables for Commercial Banks in Ethiopia from 2002-2013 were demonstrated as follows:

Table 4.2 *Summary of Descriptive Statistics*

Variables	Observation	Mean	Standard Deviation	Minimum	Maximum
NPL	95	11.82821	12.25082	0.3	60.04
LTD	96	69.92695	19.9799	21.23	121.17
ROE	96	22.64032	14.3512	-57	70
ROA	96	2.519219	1.397962	-2.13	11.62
CAR	96	11.29685	4.008946	4	28.03
ALR	96	10.98385	1.502616	7	12.3
INF	96	14.16667	12.65086	-10.6	36.4
ETR	96	29.93375	11.49718	-7	125

Source: own computation from NBE and CSA via Stata 12

NPLs ratio measured by Nonperforming loans divided by total loan ranges from 0.3- 60.04 percent. It has a mean of 11.82% showing the lowest deviation (-0.43%) from its mean value. This indicates that Commercial banks in Ethiopia incurred 11.82%NPLs on averages from its total loan. According to Ethiopian context, the banking sectors are required to maintain the ratio of NPLs at least below 5% (NBE, 2008). However, as indicated above in table 4.2, the NPLs of commercial banks in Ethiopia are more than the required threshold. Thus, NPLs problem are still serious for commercial banks in Ethiopia.

Regarding LTD ratio that measured by total loans divided by total deposits, it ranges from a minimum of 21.23% to a maximum of 121.17%. It has a mean of 69.93% with highest deviation (49.95%) from its mean value. As far as profitability ratios concerned, ROA records a minimum of -2.13 and maximum of 11.62% with a mean value of 2.52%.In case, even if high ROA indicates better performance in the management of available assets, commercial banks in Ethiopia shows low performance with regard to ROA during the study period as compared to ROE.

On the other hand, 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 4.2, ROE records a minimum of -57% and maximum of 70% with a mean of value of 22.64%.This implies that commercial banks in Ethiopia have relatively a good

performance in terms of ROE as compared to ROA during the study period. 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 4 and maximum of 28.03% with a mean value and standard deviation of 11.29% and 4.009% respectively. This indicates that CAR for the sample commercial banks in Ethiopia during study period was above the minimum requirement, which is 8%. Furthermore, ALR demonstrates a minimum of 7 and maximum of 12.3% with a mean value 10.99% showing 1.5% deviations from its mean. Finally, INF ranges from minimum values of -10.6% to a maximum of 36.4% and effective tax rate ranges from a minimum of -7% to maximum of 125%.

To sum up, LTD ratio had the highest deviation (49.95%) whereas NPLs had the lowest deviation (-0.43 %.) from its mean Value. Besides, commercial banks in Ethiopia earned high return from its own equity than assets. Furthermore, average value of NPLs of commercial banks in Ethiopia are above the required threshold (<5%) showing a serious loss from loans whereas CAR are more than the minimum requirement (8%) showing better risk withholding ability of banks as per the National bank of Ethiopia.

4.4 Analysis for Nonperforming Loans Trend Form 2002-2013

This analysis establishes a pattern for nonperforming loans (NPLs) of commercial banks operating in Ethiopia during the period under consideration, which is from 2002-2013. Accordingly, the following figure 4.1 provides a respective pictorial presentation for NPLs figure from 2002-2013. In the following figure 4.1; x-axis represents the years whereas y-axis represents the level of NPLs of commercial banks in Ethiopia.

Fig 4.1 *Moving Trend analysis of Nonperforming Loans*
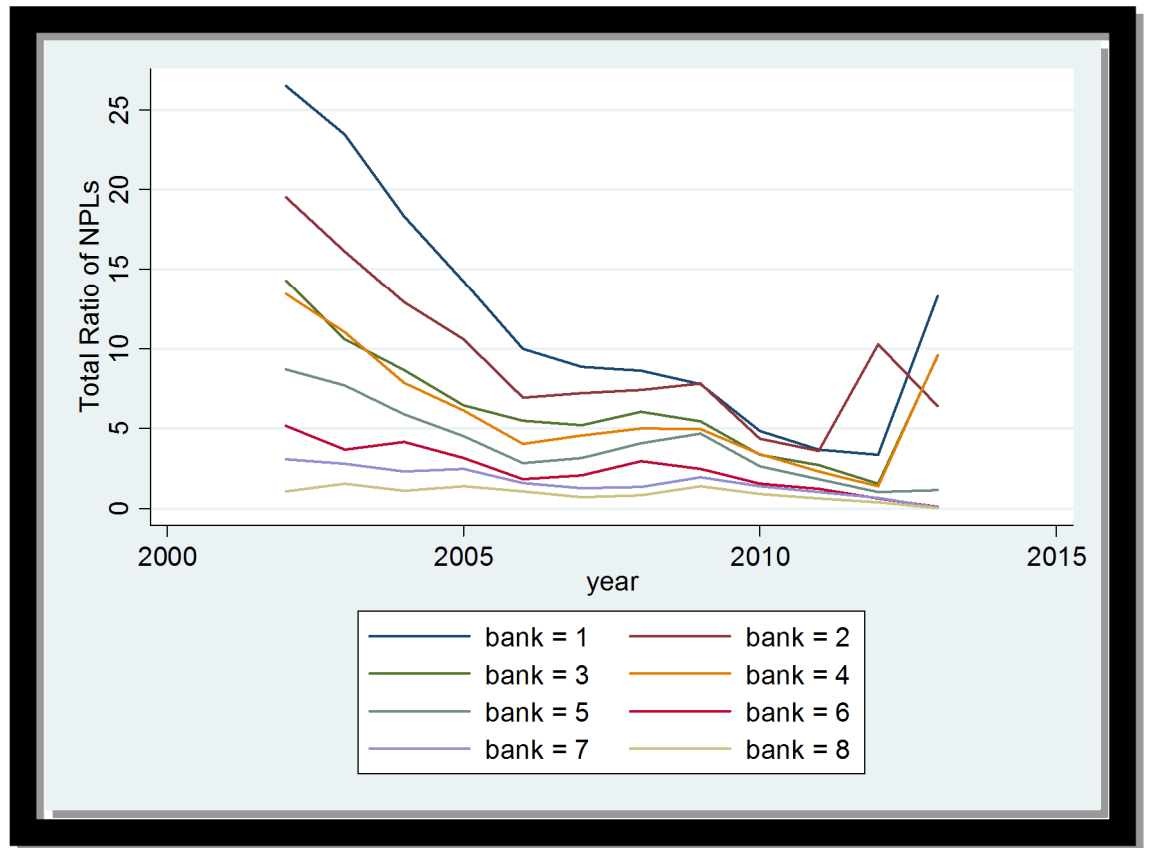
As it can been seen from the above fig 4.1, the trends of nonperforming loans of commercial banks in Ethiopia for the period from 2002 to 2013 are decreasing. This significant decline of NPLs might imply either improvement in the levels of loan quality or being escaping of banks from providing loan and advances. Even if, there is a decreasing trend in the level of NPLs ratio from 2002-2013, descriptive result shows that NPLs problem is still above the industry average for commercial banks in Ethiopia. Thus, this result suggests the downward sloping trend of NPLs.

4.5 Test 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 2002-2013.

However, this section provide test for the classical linear regression model (CLRM) assumptions such as normality, heteroscedasticity, autocorrelation and multicolinearity tests.

The linearity of the parameter is assumed since the model applies linear ordinary least square (OLS). The objective of the model is to predict the strength and direction of association among the dependent and independent variables. Thus, in order to maintain the validity and robustness of the regression result of the research in CLRM, it is better to satisfy basic assumption CLRM. 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.

4.5.1 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 u_i 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.

4.5.2 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 and Seid, 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 95 confidence 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 appendix1A, there is no heteroscedasticity problem for this study hence the p value is 23.76% showing insignificant value.

4.5.3 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 2in application, it is assumed that there is no autocorrelation problem. Thus, as shown in appendix 1A the computed "d" in this study was 1.875 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.

4.5.4 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).

In case, Pearson correlation matrix and Variance inflation factor (VIF) are used for testing multicolinearity in this study. Pearson correlation matrix is a technique used for testing multicolinearity of explanatory variables by investigating their relationship and also useful to measure the propensity of how much the independent variables influence the dependent variable wooldridge (2005) cited in Theodros (2005).

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 return on asset, average lending rate, inflation and effective tax rate where nonperforming loans are considered as dependent variable whereas loan to deposit ratio, return on equity, return on asset, capital adequacy ratio, average lending rate, inflation and effective tax rate are explanatory variables used in this study.

Thus, as it can be seen from appendix1B, 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 or larger.

However, multicolinearity between explanatory variables may result wrong sign in the estimated coefficients and bias the standard errors of coefficients (Theodros, 2011). To overcome this problem, VIF test was conducted. That means, the larger the value of VIF indicates the more collinearity of the variables with each other. According to the rule of thumb, if VIF of a variable exceeds 10, the variable is said to be highly collinear (Bedru and Seid, 2005). Accordingly, the variance inflation factor test as indicated in appendix1C.

Based on the result indicated in appendix1C, there is no multicolinearity problem in this study. This is due to the fact that the mean of VIF of variables is 1.52 which is much lower than the threshold of 10.The VIF for each variable also very low. This indicates that the explanatory variables included in the model were not correlated with each other.

To sum up, beside the descriptive statistics, correlation analysis is made for explanatory variable to detect the multicolinearity problem in the regression model. In case, there is no multicolinearity problem between variables. Thus, the explanatory variables are the basic determinants of NPLs of 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.

4.6 Model Selection

4.6.1 Random Effect versus Fixed Effect Models

Econometrics model used to examine the impact of loan to deposit ratio, capital adequacy ratio, return on equity, return on asset, and lending rate, inflation and effective tax rate on nonperforming loans of commercial banks in Ethiopia was panel data regression model which is either fixed-effects or random-effect model. The appropriate test used to decide whether fixed effect or random effect model is appropriate was Hausman Specification Test. Thus, Hausman Specification Test identifies whether fixed-effects or random-effect model is most appropriate

under the null hypothesis that unobservable individual effects (u_i) are uncorrelated with one or more of explanatory variables (X_i).As noted by Gujarati (2004), fixed effect model is most appropriate when null hypothesis is rejected whereas random effect is appropriate when null hypothesis is not rejected.

For Hausman test, the null and alternative hypotheses are as follows:

H_o: u_i is not correlated with X_i (random- effects model appropriate)

H_1: u_i is correlated with X_i (fixed-effects model appropriate)

Thus, to test the null hypothesis, it requires comparing the estimates from the random-effects and the fixed-effects estimator. Random-effect estimator is consistent under the null hypothesis, but inconsistent under the alternative hypothesis whereas fixed-effect estimator is consistent under both the null and alternative hypothesis. If the estimates for the random-effects estimators are not significantly different from the estimates for the fixed-effects estimator, then the null hypothesis is accepted and conclude that u_i is not correlated with X_i, and therefore the random-effect model is the appropriate model. If the estimates for the random effect estimator are significantly differ from the estimates for the fixed-effect estimator, the null is rejected and conclude that u_i is correlated with X_i, and therefore the fixed-effect model is the appropriate model for the study. Besides, if the number of year is exceeds number of cross section, fixed effect model is appropriate which is true for this study (ibid).

Accordingly, appendix1D demonstrates the Hausman Specification Test that used to decide the best model for this study. The decision rule, for Hausman Specification test is rejecting the null hypothesis when the p-value is significant. Thus, as shown in Appendix1D, the Hausman specification test for this study has a p-value of 0.0397 for the regression models. This indicates that p-value is significant and then the null hypothesis is rejected justifying as fixed effect model is appropriate for the given data set in this study.

4.7 Result of Regression Analysis

This section presents the regression result of fixed effect model that made to examine the determinant of NPLs of commercial banks in Ethiopia. Accordingly, the regression result was made and coefficients of the variables were estimated via STATA version 12 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 commercial banks in Ethiopia in this study was:

$NPL_{it} = \beta_0 + \beta_1(LTD)_{it} + \beta_2(CAR)_{it} + \beta_3(ROA)_{it} + \beta_4(ROE)_t + \beta_5(ALR)_{it} + \beta_6(INFR)_{it} + \beta_7(ETR)_{it} +$

ε_{it}..(2)

Where;

NPL= nonperforming loan ratio of bank 'i' in year t

LTD= represent Loan to deposit ratio of bank 'i' in year t

CAR= capital adequacy ratio of bank 'i' in year t

ROA= return on asset of bank 'i' in year t

ROE=return on equity of bank 'i' in year t

ALR= Average lending rate of bank 'i' in year t

INFR=inflation rate of bank 'i' in year t

ETR = effective tax rate of bank 'i' in year t

β_0= an intercept,

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6,$ and $\beta_7,$ = estimated coefficient of explanatory variables for bank 'i' in year t

ε_{it}= the error term for error terms for intentionally/unintentionally omitted or added variables. It has zero mean, constant variance and non- auto correlated.

This study used panel data models that comprises of both random and fixed effect model to examine the relationship between NPLs and explanatory variables. To select either Random or Fixed Effect Model, the character of individual effects was tested through the Hausman specification test. Based on comparison result between random and fixed effect model through Hausman test, an appropriate model for this study was fixed effect model. Thus, the cause and effect relationship between NPLs and explanatory variables was examined by fixed effect model.

Accordingly, table 4.3 below presents the result of Fixed Effect regression model made to examine the impact of explanatory variables on NPLs. Hence, NPLs ratio is dependent variable whereas loan to deposit ratio, capital adequacy ratio, return on asset, return on equity, average lending rate, inflation rate and effective tax rate are explanatory variables. Thus, the regression

result in the following table 4.3 demonstrates both coefficients of explanatory variables and corresponding p-values as follows.

Table 4.3 *Results of fixed effect regression model*

Explanatory Variables	Coefficient	Std. Error	P>|t|
Loan to Deposit Ratio(*H1**)	0.0061738	0.0593928	0.917***
Capital Adequacy Ratio(*H2**)	-0.559224	0.0697555	0.000*
Return on Asset (*H3***)	3.832226	0.7330695	0.000*
Return on Equity (*H4**)	-1.046489	0.3070609	0.001*
Average Lending Rate (H5**)	-2.953288	0.6861642	0.000*
Inflation Rate (*H6**)	-0.065195	0.0717177	0.366***
Effective Tax Rate (*H7**)	0.1681874	0. 0715277	0.021**
Constant	54.49	9.94697	0.000*
R^2 0.6426 rho .41139 Prob>F=0.0001			

Source: own computations Via Stata 12 from NBE and CSA

  Note: *significant at 1%, **significant at 5%, and ***insignificant*

   H* accept null and H** reject null hypothesis

Thus, based on the above table 4.3, the following model was developed to examine the determinants of NPLs in this study.

NPL = 54.49+0.0062LTD -0.56CAR+3.83ROA-1.05ROE-2.95ALR-0.065INFR+0.67ETR+Ɛ

As shown in the above table 4.3, coefficient of determination was 64.26% revealing that 64.26% of variation in NPLs ratio is explained by the selected explanatory variables (loan to deposit ratio, profitability, capital adequacy ratio, average lending rate, inflation rate and effective tax rate). Besides, Rho displays that 41.14% variation in NPLs is due to entity specific characteristics of the selected cross sectional entities i.e. commercial bank in Ethiopia. Furthermore, Since F- statistics is designed to jointly test the impact of explanatory variables on dependent variables; F-statistics of this model has a p-value of 0.0001 indicating rejecting of the

null hypothesis. This implies that all selected explanatory variables can affect the level of NPLs in common.

Furthermore, the researcher examined the impact of both bank specific and macroeconomic factor on the level of NPLs based on regression result of fixed Effect Model in the above table 4.3 in terms of examination of coefficients of explanatory variables and significance level.

Through the examination of coefficients for bank specific factors, ROE and CAR had negative impact on NPLs having a coefficient of -0.56 and -1.05 respectively. This indicates that one unit change in ROE and CAR can result a change on NPLs rate by 0.56 and 1.05units in opposite direction respectively. However, ROA had positive impact on NPLs having a coefficient of 3.83 which implies one unit change in ROA can result a change on NPLs rate by 3.83units in the same direction. LTD also had positive impact on NPLs. Besides, from macroeconomic factors, average lending rate had negative impact on the level of NPLs having a coefficient of-2.95 which indicates a one unit change (increase/decrease) in average lending rate can result a change on NPLs by 2.95 units in opposite direction. Besides, INFR had negative impact on NPLs. Whereas effective tax rate had positive impact on the level of NPLs having a coefficient of 0.17 which indicates one unit change in tax rate can result a change on NPLs by 0.17units.

In terms of significance level (corresponding p-value), all explanatory variables had p-values of less than the selected significance levels (5%) except for LTD and INF. As shown in the above table 4.3, ROA, CAR and ALR had strong and statistically significant (p-value = 0.000) impact on the level of NPLs even at 1%. Besides, ROE and ETR had statistically significant (p-value = 0.021and 0.001 respectively) impact on the level of NPLs at 5%. However, LTD and INF had no statistically significant impact on the level of NPLs with a p-value of 0.917* and 0.366* respectively.

Thus, contrary to the researcher`s expectation, LTD ratio from bank specific factor and inflation rate from macroeconomic factors did not show any significant impact on the level of NPLs of commercial banks in Ethiopia. Furthermore, the above table 4.3 shows rejection of null hypothesis for ROA and ALR.

4.8 Discussion

Based on previous studies and the finding of this study, this section discussed the general result obtained via Fixed Effect regression Model as shown in the above table 4.3. Referring the literature, the result of each explanatory variable including their impact on the level of NPLs of commercial banks in Ethiopia was discussed. Thus, result of the finding was discussed in relation to the previous empirical and theoretical evidences.

4.8.1 Determinants of Nonperforming Loans

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

Return on Equity (ROE)

The results of fixed effect model in the above table 4.3 indicate that there is a negative and statistically significant impact of ROE on the level of NPls. The result shows strong effect of bank profitability measured in terms of ROE on NPLs with a coefficient of -0.56 and a p-value of 0.000 at 1% and 5% significance level. This implies that for one unit change in ROE, keeping the other things constant had resulted 0.56 unit change on the level of NPLs in opposite direction. This result confirms the finding of Makri *et al*.(2014) and Boudriga *et al.(*2009) where aggregate country data was used, Klein (2013), Shingjerji(2013), Ahmad and Bashir(2013) and Hyun and Zhang(2012) where particular country data was used.

Contrary to the finding of Louzis *et al.(*2012) where particular country data was used, this result, as expected, indicates a negative significant effect of ROE on the levels of NPLs of commercial banks in Ethiopia. This implies that deterioration of profitability ratio in terms of ROE leads to higher NPLs. This negative significant impact of ROE on the levels of NPLs indicates the existence of better management of funds invested by shareholders via good agency relationships in commercial banks in Ethiopia.

Return on Asset (ROA)

The regression result of fixed effect model in the above table 4.3 is inconsistent with the hypothesis developed by the researcher. The study hypothesized that there is a negative association between ROA and NPLs of banks. Contrary to the hypothesis, the estimated coefficients and test statistics of ROA was 3.83 and 0.000 respectively. This reveals positive and statistically significant impact of ROA on the levels of NPLs and implies that for one unit change in bank profitability measured in terms of ROA, keeping the other thing constant had resulted 3.83unitchange on the level of NPLs in the same direction.

Unlike the study made by Boudriga *et al.*(2009) and Makri *et al.*(2014) where aggregate country data was used, and Selma and Jouini(2013) where particular country data was used, the results of this study confirms the finding of Swamy(2012) and, Ahmad and Bashir(2013)where single country data was considered. Thus, results of this study examined positive significant effect of bank profitability measured in terms of ROA on the levels of NPLs of commercial banks in Ethiopia.

The main reason for this positive impact of ROA on the levels of NPLs resulted from bank managements' inefficiency on asset utilization and also poor loan quality in the Ethiopia. Thus, the finding implies that commercial banks in Ethiopia are less incentive for return gained from assets and also to provide loans.

Capital Adequacy Ratio (CAR)

Regarding capital adequacy ratio that determines the risk taking behavior of banks, this study identifies statistically significant and negative impact of capital adequacy ratio on NPLs. Thus, regression result of fixed effect model in the above table 4.3 is consistent with the hypothesis developed in this study. The study hypothesized that there is a negative association between CAR and NPLs of banks. This negative sign indicates an inverse relationship between capital adequacy ratio and NPLs. Thus, it implies that for one unit change in the banks' capital adequacy ratio, keeping other thing constant had resulted 0.56 unit changes on the levels of NPLs in opposite direction.

The result of this finding is consistent with the study of Hyun and Zhang (2012) where particular country data was used and Makri *et al.* (2014) where aggregate country data was used. Unlike the study made by Boudriga *et al.*(2009), and Djiogap and Ngomsi (2012) where aggregate country data was used and , Shingjerji(2013) and Swamy(2012) where particular country data was used, the result of this finding confirms significant negative effect of CAR on the levels of NPLs of commercial banks in Ethiopia by supporting the arguments that state well capitalized banks are better able to resist the levels of risk. This implies commercial banks in Ethiopia are less the incentives to take riskier loan activities due to highly regulated nature of the institution in the country. Thus, negative impact of CAR on NPLs is due to effective regulatory pressures by NBE on capital adequacy ratio of banks and also bank managements' efficient utilization of its capital to absorb NPLs.

Lending Rate

The regression result of fixed effect model in the above table 4.3 is inconsistent with the hypothesis developed in this study. The study hypothesized that there is a positive association between lending rate and NPLs of banks. Unlike the findings of Ranjan and Chandra (2003) and Farhan *et al.*(2012), Louzis *et al.*(2010), Sakiru *et al.*(2011), Tomak(2012), Konfi (2012), and Daniel and Wandera(2013) where aggregate country data was used, the result of Fixed Effect Model in the above table 4.3 indicates statistically significant negative impact of lending rate on NPLs in Ethiopia. This negative sign indicates an inverse relationship between lending rate and NPLs. It implies that for one unit change in the banks' lending rate, keeping other thing constant had resulted 2.95 units change on the levels of NPLs in opposite direction.

The finding of this study confirms the finding of Joseph(2011), Saba *et al.* (2012), Ahmad and Bashir(2013), Hyun and Zhang (2012) and Ali and Eva (2013) that argues negative effect of lending rate on the NPLs of banks. Thus, according to commercial banks in Ethiopia, change in lending rate had no direct impact on NPLs since change in lending rate has a limit by regulatory authorities.

The main reason for this negative association between lending rate and NPLs for Commercial bank in Ethiopia is: First, higher lending rate curtail ability to borrow, which decreases the amount of loan and then reduce NPLs. In case, higher lending rate enable individuals with funds

to start saving with the banks to earn on their funds but investors with the profitable projects feel unwilling to borrow and invest. Second, increasing the level of lending rate has maximum and minimum limit by itself. That means degree of increase in lending rate and amount of NPLs may not be equal. Rather, ability to repay debt depends on other factors like borrowers' source of income. That is due to mismatch between the time they got return from their investment and the time they repay their debts. In case, when lending rate increases at the time they got return on their investment, the borrowers' ability to repay their debt increase resulting reduction in NPLs.

Effective Tax Rate (ETR)

The regression result of fixed effect model in the above table 4.3 is consistent with the hypothesis developed in this study. The study hypothesized that there is positive association between effective tax rate and NPLs of banks. Thus, consistent with the hypothesis, the estimated coefficients and test statistics of effective tax rate was 0.17 and 0.021 respectively showing statistically significant positive impact of effective tax rate on the level of NPLs commercial banks in Ethiopia. This implies that every one unit change in effective tax rate, keeping other thing constant had resulted 0.17 units change on the levels of NPLs in the same direction. The result of this study indicates that commercial banks in Ethiopia incur high NPLs at the time of high corporate income tax payment. The result of this study confirms the arguments of Albertazzi and Gambacorta (2006), Kaplow (2008) and Khan *et al*.(2011). Thus, this result implies as NPLs of commercial banks in Ethiopia gets higher during high income tax rate in the country.

This positive and statistically significant impact of effective tax rate on NPLs of commercial banks in Ethiopia result as bank shift its tax burden to borrowers via increasing fees and other commission, and also lending rate on loans, the borrowers pay this tax burden for the banks as compensation and also their own tax to the government as an obligation. Thus, borrowers who faced this double burden are unable to pay their debt.

4.9 Summary

This chapter discussed the results of documentary analysis regarding the determinant factors of nonperforming loans of commercial bank in Ethiopia. In case, trends of NPLs of commercial

banks, descriptive statistics, and some diagnostic tests for classical linear regression model assumptions was presented. Regarding the trend analysis of NPLs, commercial banks in Ethiopia had downward sloping of NPLs for the period under consideration. i.e. from 2002-20013 periods. From descriptive statistics, the levels of NPLs of commercial banks in Ethiopia are still above the threshold. i.e more than 5 %. Besides, Commercial banks in Ethiopia earn high return from funds invested by the shareholders rather than from its assets. Furthermore, Capital adequacy ratio is above the minimum requirements on average. To this end, normality, heteroscedasticity, multicolinearity and autocorrelation problem was checked. Eventually, the result shows that capital adequacy/solvency ratio, bank profitability measured in terms of ROA and ROE, lending rate and effective tax rate were statistically significant factors that determine the NPLs of commercial banks in Ethiopia. However, the result did not support the significant effect of Loan to deposit ratio and inflation rate. In case, the result of this finding is compared with the other researchers finding in the following table 4.4. The next chapter comes with conclusion and recommendation for this study including the direction for further study.

Table 4.4 *Comparison of Finding on Determinants of Nonperforming Loans from Previous Studies*

Author	Year	country	Model	Finding on Variables Used (Sign and Significance)						
				V1	V2	V3	V4	V5	V6	V7
Boudruga *et al.*(2009)	2002-2006	Africa	RE		-**		+**			
Skarica(2013)	2007-2012	Europe	FE						+*	
Makri *et al.*(2014)	2000-2008	Europe	RE		-*	-*		+*	+*	
Selma and Jouini(2013)	2004-2008	Italy, Greece& Spain	FE		-*					
Klein(2013)	1998-2011	Europe	FE						+*	
Djiogap and Ngomsi(2012)	2001-2010	Malaysia	FE				-*		+**	
Sakiru *et al.*(2011)	2007-2009	Africa	ADRL						+*	
Hyun and Zhang (2012)	2002-2006	US	OLS			-*	-*	-*		
Tomak (2013)	2003-2012	Turkey	OLS				+**		+*	
Ahmad and Bashir(2013)	1990-2011	Pakistan	OLS		+*	-*	-*			
Saba *et al.* (2012)	1985-2010	US	OLS					-*		
Louzis *et al.*(2010)	2003-2009	Greece	FE	+**	-*	-*	-**	+*	+*	
Ali and Iva(2013)	2002-2012	Albanian	OLS		-*	-**			+**	
Swamy(2012)	1997-2009	Indian	FE	**	+*		**	**		
Farhan *et al.*(2012)	2006	Pakistan	OLS					+*	+*	
Badar and Yasmin(2013)	2002-2011	Pakistan	EC					*	*	
Ranjan and Chandra(2003)	2002	Indian	Descriptive	-*				+*		
Daniel and Wandera(2013)	2007-2012	Kenya	>>					+*		
Joseph(2011)	2010	Kenya	>>					+*		
Konfi(2012)	2006-2010	Ghana	OLS					-*		
Gadise(2014)	2002-2013	Ethiopia	FE	+**	+*	-*	-*	-*	-**	+*

Source: researchers own computation

Note:-*negative and significant, -** negative but insignificant, +* positive and significant, +**positive but insignificant.V1,V2,V3,V4,V5,V6 and V7 represents Loan To Deposit, Return on Asset, Return on Equity, Lending Rate, Inflation Rate and Effective Tax Rate respectively. EC represent error correction methods

CHAPTER FIVE

CONCLUSION and RECOMMENDATION

Summary; the previous chapter presented descriptive analysis and examined the trends of NPLs of commercial banks in Ethiopia. Besides, the results of findings and discussion were also made as well.

This chapter sums up the findings of the study. Accordingly, the first section is the conclusion part that presents a brief summary for the finding of the study. Lastly, the second section reveals the recommendation for the finding whereas section three highlights the direction for further studies.

5.1 Conclusion

The main objective of this study was to examine the determinants of nonperforming loans (NPLs) of commercial banks in Ethiopia based on panel data analysis on the time period from 2002 to 2013. The data was analyzed by using Fixed Effect Model. For the purpose of analysis, Stata version 12 was used. The finding of the trend analysis of NPLs shows a downward sloping of NPLs of commercial banks in Ethiopia over the time of study. The study found out that ROE, ROA, capital adequacy ratio, lending rate, and effective tax rate had statistically significant effect on the level of NPLs. However, the results of fixed effect regression model revealed the insignificant effect of loan to deposit ratio and inflation rate on the level of NPLs of commercial banks in Ethiopia for the period under consideration.

On the other hand, the findings indicated that bank profitability measured in terms of ROA has positive and statistically significant impact on NPLs. This result is unusual since one would expect a negative impact of bank profitability on NPLs. This implies that commercial banks in Ethiopia are less incentive to increase return via in utilizing its assets.

However, bank profitability measured in terms of ROE had negative and statistically significant effect on the levels of NPLs. This implies effective management of commercial banks in Ethiopia on utilization of funds contributed by shareholders.

Similarly, the study also found out that capital adequacy ratio has negative and statistically significant impact on NPLs of commercial banks in Ethiopia. This indicates banks with strong capital adequacy have a tendency to absorb possible loan losses and thus, reduce the level of NPLs due to efficient utilization of its capital.

The finding of the lending rate is also surprising. It showed negative and statistically significant impact of lending rate on the level of NPLs. This implies due to other extraneous factors, increase in lending rate reduces the levels of NPLs for commercial banks in Ethiopia.

Furthermore, Effective tax rate is a factor that has positive impact on the levels of NPLs of commercial banks in Ethiopia as per the regression result in this study. Thus, the presence to shift tax burden to borrowers resulted in the occurrence of NPLs for commercial banks in the country.

5.2 Recommendation

Based on the findings of the regression analysis and conclusion, the following recommendations were forwarded.

In order to improve asset quality, specifically loans, it is strongly recommended that bank management and loan officers should always give a serious attention to the health of asset quality of banks specifically loan performance for prevention of loans loss. In order to curtail the chance of occurrence of NPLs; it is better for the bank managers to give due emphasis on the asset management decision. Once assets are considered as appropriate sources of financing, these assets must be managed efficiently. Thus, it is better for the bank managers to efficiently utilize its current assets and loans than fixed assets in order to reduce the level of nonperforming loans. Besides, loan officers should provide financial counseling to the borrowers on the wise use of loan and should make decision on timely fashion to meet their needs. If so, the banks management on asset utilization is improved and then reduces the level of NPLs commercial banks in the country.

Lending rate has an influential impact on the level of NPLs. The degree of increasing and decreasing the level of lending rate has its own limit as per the regulatory authorities of the country set by the NBE. It is imposed to overcome different costs. In case, it is better for the

bank management to use moderate lending rate and overcome its costs via increasing fees and commission charges on current account and ATM withdrawal charges which are very important to reduce NPLs level as per the result of this study. Thus, since the maximum and minimum lending rate is fixed by the NBE, bank management has to impose moderate lending rate in between and compensate its costs through increasing fees and other commission charges like for current account and ATM withdrawal charges. Besides, it is strongly recommendable for the loan officers to communicate with the borrowers on timely basis regarding their investments to ensure their loan repayment ability.

As banking sectors shift their tax burden to their borrowers, borrowers' ability to repay their debt would be curtailed and then results in the occurrence of NPLs. Thus, in order to reduce the level of NPLs, it is better for the bank management either to avoid or substitute shifting of its tax burden via rearranging its financial affairs like reinvesting dividend payment (making cash payments to shareholders via repurchasing their own shares) and increasing deduction like interest expense. In case, if bank management substitute or avoid its tax burden, capital gains tax rate is reduced making banks less incentive to spread/shift its tax burden to its borrowers that would result in the occurrence of nonperforming loans.

Direction for Further Research

This study examined both bank specific and macroeconomic determinants of nonperforming loans of senior commercial banks in Ethiopia using selected variables. However, there are so many variables that were not included in this study. Thus, future researchers may be interested in validating the consistency of the result and provide supplementary results for this study by including other variables like GDP growth rate, size, ownership, unemployment rate and the like on the same banks. Furthermore, the same study may be required on newly emerging banks.

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APPENDICES

Appendix1: Model Selection and Basic Tests for CLRM Assumptions

Appendix.1A:- Heteroscedasticity and autocorrelations test

Breusch-Pagan / Cook-Weisberg test	0.2376
Durbin-Watson stat	1.875856 $\approx$2)

Note: Breusch-Pagan / Cook-Weisberg test for heteroscedasticity whereas Durbin-Watson stat for autocorrelation

Appendix.1B:- *Pearson Correlation Matrix*

	NPL	LTD	ROE	ROA	CAR	ALR	INF	ETR
NPL	1.0000							
LTD	0.0444	1.0000						
ROE	-0.4595	-0.2434	1.0000					
ROA	-0.2149	-0.2719	0.4000	1.0000				
CAR	-0.3340	0.2673	-0.2759	0.2100	1.0000			
ALR	-0.4361	-0.4346	0.3727	0.4958	0.0157	1.0000		
INF	-0.3908	-0.2306	0.3433	0.3461	0.0478	0.5179	1.0000	
ETR	0.1458	0.1522	-0.0401	-0.1919	0.0953	-0.2052	-0.2728	1.0000

Note: NPL stands for Nonperforming loan ratio, LTD for Loan to deposit, CAR for Capital adequacy ratio, ROE for Return on equity, ROA for Return on asset, ALR for Average lending rate, INF for Inflation rate and ETR is for Effective Tax Rate.

Source: NBE and CSA via Stata 12

Appendix.1C:- *summary of VIF*

Variable	VIF	1/VIF(Tolerance)
LTD	1.84	0.542937
ROE	1.71	0.584794
ROA	1.58	0.632050
CAR	1.51	0.660930
ALR	1.46	0.686811
INF	1.40	0.715914
ETR	1.15	0.868705
Mean VIF	1.52	

Source: NBE and CSA via Stata 12

Note: *LTD for Loan to deposit ratio, CAR for Capital adequacy ratio, ROE for Return on equity, ROA for Return on asset, ALR for Average lending rate, INF for Inflation rate and ETR is for Effective Tax Rate.*

Appendix 1 D: *Hausman specification Test*

                        ---- Coefficients ----
Variables   (b)   (B)   (b-B)   sqrt(diag(V_b-V_B))

	Fixed	Random	Difference	S.E
ltd |	.0061738	-.0207366	.0269104	.0325664
roe |	-.559224	-.5311307	-.0280933	.
roa |	3.832226	3.145826	.6863999	.
car |	-1.046489	-1.762226	.715737	.1762966
avlr |	-2.953288	-2.574673	-.3786152	.
infl |	-.065195	-.0701667	.0049717	.
taxrate |	.1681874	.1756848	-.0074975	.

b = consistent under Ho and Ha;

B = inconsistent under Ha, efficient under Ho;

Test: Ho: difference in coefficients not systematic

$$\text{chi}^2 (7) = (b-B)'[(V\_b-V\_B)^{\wedge}(-1)](b-B)$$

$$= \quad 14.73$$

$$\text{Prob>chi}^2 = \quad 0.0397$$

(V_b-V_B is not positive definite)

Source: NBE and CSA via Stata 12

Appendix 2: *Raw Data*

Bank	year	NPL	LTD	ROE	ROA	CAR	Av.LR	INFL	tax rate
CBE	2002	52.09	53	-57	-2.13	4	10.5	-10.6	-7
CBE	2003	53.5	43	43	2.25	5	10.5	10.9	24
CBE	2004	37.68	37	22	1.19	5	10.5	7.3	31
CBE	2005	27.52	38	40	1.72	4	10.5	6.1	28
CBE	2006	22.45	33	53	2.24	4	10.5	10.6	28
CBE	2007	14.52	30	20	1.99	10	11.5	15.8	26
CBE	2008	5.33	46	30	2.7	9	12.25	25.3	27
CBE	2009	3.66	48	38	3.23	8	12.25	36.4	29
CBE	2010	1.88	44	35	2.65	7	11.875	2.8	30
CBE	2011	0.86	42	46	2.51	5	11.875	18.1	32
CBE	2012	2	53	70	3.42	5	11.90	33.8	31
CBE	2013	0.99	48	68	3.5	6	11.90	13.5	32
CBB	2002	41.55	119.57	5.19	0.42	8.04	8.70	-10.6	50
CBB	2003	40.09	114.96	13.92	1.17	8.4	7.00	10.9	21
CBB	2004	35.47	107.16	4.82	0.38	7.85	10.50	7.3	43
CBB	2005	27.76	81.16	16.04	0.93	5.79	10.50	6.1	35
CBB	2006	19.42	121.17	35.67	3.12	8.74	10.50	10.6	29
CBB	2007	17.06	116.99	26.42	2.96	11.22	11.50	15.8	31
CBB	2008	15.56	93.13	32.5	3.52	10.83	12.30	25.3	27
CBB	2009	11.45	85.77	27.32	2.84	10.38	11.9	36.4	30
CBB	2010	6.56	74.28	28.61	2.9	10.13	12.25	2.8	30
CBB	2011	6.81	68.88	23.65	2.45	10.36	12.25	18.1	30
CBB	2012	9.7	51.27	24.22	1.95	8.05	11.90	33.8	29
CBB	2013	10	53	25	2	8	11.90	13.5	30
DB	2002	14.22	73.22	19.67	1.62	8.21	8.70	-10.6	38.5
DB	2003	8.89	78.16	20.93	1.36	6.48	7.00	10.9	27.03

DB	2004	7.44	77.59	32.56	2.09	6.43	10.50	7.3	28.21
DB	2005	6.72	78.79	29.22	2.07	7.11	10.50	6.1	26.8
DB	2006	6.21	85.7	34.46	2.93	8.49	10.50	10.6	28.11
DB	2007	5.95	82.04	34.34	3.09	9.01	11.50	15.8	27.52
DB	2008	5.89	71.23	32.72	3.05	9.33	12.30	25.3	28.12
DB	2009	7.39	56.17	27.5	2.57	9.33	11.9	36.4	29.11
DB	2010	3	49.77	28.85	2.62	9.09	12.25	2.8	29.29
DB	2011	3.38	52.51	32.27	3.07	9.52	12.25	18.1	28.45
DB	2012	2.15	57.76	35.67	3.72	10.43	11.90	33.8	27.01
DB	2013	2.25	55.91	29.66	3.07	10.36	11.90	13.5	25.36
AIB	2002	34.02	68.49	9.16	1.08	11.78	8.70	-10.6	36.84
AIB	2003	25.13	68.73	10.22	0.99	9.78	7.00	10.9	22.22
AIB	2004	18.39	63.36	16.77	1.47	8.75	10.50	7.3	25.71
AIB	2005	12.02	66.49	16.67	1.7	10.24	10.50	6.1	30.91
AIB	2006	9.56	72.93	25.66	2.64	10.29	10.50	10.6	29.73
AIB	2007	7.36	80.72	32.99	3.73	11.32	11.50	15.8	29.9
AIB	2008	8.66	70.75	23.91	2.96	12.39	12.30	25.3	30
AIB	2009	5.78	54.67	19.07	2.23	11.68	11.9	36.4	29.38
AIB	2010	5.47	51.52	26.33	3.12	11.84	12.25	2.8	29.44
AIB	2011	3.81	51.48	27.57	3.56	12.93	12.25	18.1	28.6
AIB	2012	2.7	59.8	24.49	3.3	13.49	11.90	33.8	25.66
AIB	2013	60.04	21.23	2.47	11.62	10	11.90	13.5	24.77
BOA	2002	37.95	73.6	-1.42	-0.18	12.35	8.70	-10.6	125
BOA	2003	28.43	75.19	4.02	0.45	11.18	7.00	10.9	25
BOA	2004	17.51	74.45	19.69	2.39	12.18	10.50	7.3	29.63
BOA	2005	12.4	75.85	24.01	2.97	12.35	10.50	6.1	25.61
BOA	2006	4.94	90.17	21.14	2.99	14.19	10.50	10.6	30.33
BOA	2007	10.54	84.71	16.63	1.97	11.87	11.50	15.8	29.47
BOA	2008	12.87	81	3.47	0.34	9.83	12.30	25.3	33.47

BOA	2009	14.75	60.28	19.35	1.83	9.48	11.9	36.4	30.95
BOA	2010	6.98	61.36	24.01	2.24	9.32	12.25	2.8	28.4
BOA	2011	3.97	54.58	27.38	2.49	9.08	12.25	18.1	29.98
BOA	2012	2.6	57.56	23.86	2.63	11	11.90	33.8	25.04
BOA	2013		54.24	17.92	1.95	10.9	11.90	13.5	24.67
WB	2002	12.94	78.83	9.38	0.93	9.91	8.70	-10.6	50
WB	2003	10.86	81.11	11.83	1.24	10.46	7.00	10.9	26.67
WB	2004	12.24	84.25	24.81	2.81	11.32	10.50	7.3	28.89
WB	2005	8.41	77.8	26.67	2.97	11.14	10.50	6.1	23.81
WB	2006	4.85	89.6	27.84	3.14	11.29	10.50	10.6	24.47
WB	2007	5.25	79.13	27.79	3.22	11.58	11.50	15.8	26.8
WB	2008	8.39	79.11	22.93	3.37	14.68	12.30	25.3	26.92
WB	2009	7.7	56.66	21.59	3.53	16.34	11.9	36.4	29.48
WB	2010	3.47	63.06	21.24	3.89	18.32	12.25	2.8	29.66
WB	2011	3.51	48.85	24.17	4.01	16.59	12.25	18.1	29.44
WB	2012	2.4	61.92	20.96	4.028	19.22	11.90	33.8	26.62
WB	2013	0.41	64.14	18.58	3.27	17.61	11.90	13.5	24.38
UB	2002	15.95	86.24	4.55	1.27	28.03	8.70	-10.6	43
UB	2003	9.93	101.05	4.49	1.067	19.4	7.00	10.9	29
UB	2004	9.9	72.18	7.29	1.04	14.24	10.50	7.3	30
UB	2005	8.45	68.55	24.8	2.89	11.65	10.50	6.1	28
UB	2006	4.18	82.3	23.04	2.75	11.94	10.50	10.6	27
UB	2007	4.59	91.5	17.78	2.93	16.49	11.50	15.8	26
UB	2008	3.98	76.11	19.46	2.8	14.39	12.30	25.3	28
UB	2009	4.62	59.52	19.99	2.01	11.18	11.9	36.4	30
UB	2010	3.76	55.32	27.36	2.96	10.81	12.25	2.8	30
UB	2011	3.35	54.02	25.72	3	11.67	12.25	18.1	28
UB	2012	2.33	60.46	27.04	3.39	12.54	11.90	33.8	27
UB	2013	0.33	60.05	23.47	2.82	12.038	11.90	13.5	24.64

NIB	2002	8.64	93.91	13.13	2.43	18.54	8.70	-10.6	40.9
NIB	2003	12.34	93.54	10.4	1.47	14.12	7.00	10.9	31.58
NIB	2004	8.77	94.47	20.23	2.81	13.87	10.50	7.3	28.57
NIB	2005	11.22	92.64	20.54	2.66	12.93	10.50	6.1	30.3
NIB	2006	8.47	101.58	20.35	2.86	14.06	10.50	10.6	28.4
NIB	2007	5.56	96.7	17.88	2.92	16.3	11.50	15.8	28.3
NIB	2008	6.73	85.58	18.9	3.1	16.39	12.30	25.3	28.8
NIB	2009	11.16	67.36	21.08	3.2	15.16	11.9	36.4	29.95
NIB	2010	7.37	61.69	21.92	3.36	15.35	12.25	2.8	29.57
NIB	2011	5.04	53.64	21.05	3.47	16.46	12.25	18.1	28.38
NIB	2012	3	63.53	18.73	3.46	18.46	11.90	33.8	26.51
NIB	2013	0.3	66.55	17.18	3.13	18.22	11.90	13.5	24.38

Source: NBE and CSA via simple excel