Addis Ababa University

College of Business and Economics

"Determinants of Non-Performing Loans: Evidence from Commercial Banks in Ethiopia"

By

Mekdes Asfawesen

Thesis Submitted to Department of Accounting and Finance in Partial Fulfillment of the Requirements for the Award of Masters of Business Administration in Finance

JUNE, 2017
Addis Ababa, Ethiopia

DECLARATION

I, undersigned declare that this study entitled as "Determinant of non-performing loan: Evidence from commercial banks in Ethiopia." is my own work. I have carried out the research work independently with the guidance and support of the research advisor. This study had not been submitted to any degree/diploma in this or any other institution.

Name of student: Mekdes Asfawesen

Signature: _____

Date: _____

CERTIFICATION

This is to certify that Mekdes Asfawesen has completed her thesis entitled as "Determinant of non- performing loan: Evidence from commercial banks in Ethiopia." In my opinion all the materials used for the thesis has been duly acknowledged and her thesis is appropriate to be submitted as a partial fulfillment requirement of Degree in Master of Business Administration in Finance (MBA in Finance).

Dr. Wollela Abehodie Yesegat

Advisor

Signature: _____

Date: _____

Addis Ababa University
School of Graduate Studies

This is to certify that the thesis "Determinant of non- performing loan: Evidence from commercial banks in Ethiopia." was carried out by Mekdes Asfawesen under the supervision of Dr. Wollela Abehodie, submitted in partial fulfillment of the requirements for the degree of Master of Science in Accounting and Finance complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

Approved by:

Internal examiner: _____ Signature _____ Date _____

External examiner: _____ Signature _____ __ Date _____

Advisor: Dr. Wollela Abehodie Signature _____ Date _____

Abstract

This study examined the bank-specific and macro-economic determinants of Non-performing loans (NPLs) of Ethiopian commercial banks. The study adopted a quantitative research approach. The study uses data collected from the National Bank of Ethiopia, Central Statistical Agency and financial statement of nine commercial banks. Data covers the period from 2006-2016. Descriptive and multiple regression analysis employed to analyze the unbalanced panel data. Findings of the study show that return on equity and capital adequacy have negative and significant impact on NPLs. Whereas, loan loss provision and loan to deposit have positive significant relationship with NPLs. The finding of this study is important since once identifying the determinants of NPLs might enable management body to make appropriate lending policies that prevent the occurrence of NPLs. The study recommended as bank managers better emphasize the management of current assets specially loans. Furthermore, preferable for commercial banks to concentrate or diversify their credit portfolio by calculating risk relative to its return in order to increase return on equity and to reduce the level of nonperforming loans. Also the study suggest for future researcher to validate the consistency of the result and provide additional results by including other variables like priority sector loan, monitory policy and sensitive sector's loan.

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

Acknowledgements

First and for most I would like to thank the almighty God with St. Virgin Mary for their divine strength and unconditional support throughout my life. My sincere thanks go to my advisor Asst.Prof Wollela Abehodie Yesegat for her unreserved assistance, suggestions and guidance. I would like to express my gratitude to my special aunt Almaz Sahle and my mother Yewrkwuha Selamab for their continuous support, encouragement, creating conducive environment and praying for my success. I haven't word to say thank you for my friend Alem Birhane, Bayech Degfew and Bereket Negusa for their moral support. My thanks also go to the staff and management of the studied banks in Ethiopia for providing financial data. I would like to thank Omer Mohammed for his assistance in statistical works. I express my gratitude Addis Ababa University for its financial support and assigned an advisor that guide me in my research. Finally, I want to thank all directly or indirectly participated in the accomplishment of the study.

Table of Contents

List of table and figure

Acronym

AIB: - Awash International Bank

ARDL: - Autoregressive Distributed Lag

BOA: - Bank of Abyssinia

CAR: - Capital Adequacy Ratio

CBE: - Commercial Bank of Ethiopia

CBO: - Co-operative Bank of Oromia

CESEE: - Central, Eastern and south eastern European

CSA: - Center of Statistical Agency

ECB: -Ethiopian commercial bank

DB: - Dashen Bank

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

UB: - United Bank

US: - United States

WB: - Wegagen Bank

ZB: -zemen bank

CHAPTER ONE: INTRODUCTION

This chapter begins by presenting brief background of the study followed by the statement of the problem. Under the statement of the problem, the study states the reasons to carry out this study. Following the statement of the problem, the broad objective and hypotheses of the study presented. Finally, significance of the study, scope of the study and organization of the paper is presented.

1.1 Background of the study

A Non-Performing Loan is a loan that is in default or close to being in default. Nonperforming loans (NPLs) are when payments of interest 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 because of some reasons such as a debtor filing for bankruptcy to doubt that payments will be made in full (Adriaan 2015). NPLs generally refer to loans which for a relatively long period of time do not generate income. This implies that the principal and interest on these loans have been left unpaid for at least 90 days (Caprio and Klin-gebiel 1999).

Commercial banks are one of the economic actors who have a lion share in the economy of a country. Banks to perform well must pay due attention for their asset quality and management. Loan is the main business, largest asset and vital source of revenue for commercial banks and hence should be managed properly (Kipyego & Moses 2013). However, loan not managed properly exposes the banks to credit risk. According to Ahmed (2006) credit risk arises from NPLs and reduces the bank profitability and its long-term operation significantly. NPL are likely to hamper economic growth and reduce the economic efficiency (Hou 2007). According to Fofack (2005) most banks in Sub-Sahara African countries were preceded by a rapid accumulation of NPLs during the 1990s crisis. Financial performance of any commercial bank is measured in terms of profitability and NPLs (Balasubramaniam 2013).A sound financial system requires minimum level of NPLs which in turn facilitates the economic development of one country.

Several empirical studies have been conducted on factors that affect banks non-performing loan by using bank specific and macroeconomic factors jointly and separately. For instance, Abiodun et al. (2013) in Nigeria and Skarica (2013) studied on the determinants of NPLs in Central and Eastern European countries. Most of the study with regard to determinant of NPLs is conducted in developed country. In Ethiopia limited studies such as Negera (2012) and Meshesha (2015) assessed the determinants of NPLs of commercial banks. But both of them did not observe the macroeconomic factors. In addition, these studies used only descriptive statistics and correlation matrix for the analysis.

National bank of Ethiopia (NBE) survey aimed to identify status of risk management practice. The report revealed that Credit, operational and liquidity risks are dominant risks and that was expected to continue for five years from the study period and credit risk take 60% of total risk (NBE 2009). Sixty percent Credit risk from total risk indicate that the availability of nonperforming loan and one of the most vital risk for Ethiopian commercial banks. Credit risk arises from nonperformance loan a borrower either inability or unwillingness to perform in the pre-commitment contracted manner and directly related to non-performing loans (Hailu 2015).The NPL amount of Ethiopian commercial banks show improvement but still the amount fluctuates year to year. For example NPLs of commercial bank of Ethiopia (CBE) for the fiscal year 2015 and 2016 1.8% and 2.5% respectively and show 0.7% increment (CBE 2017).

1.2 Ethiopian loan classification and provision

(NBE 2008) Article (4.6) loans and advances are defined as: “any financial assets of a bank arising from a direct or indirect advance (i.e. unplanned overdrafts, participation in a loan syndication, the purchase of loan from another lender etc.) or commitment to advance funds by a bank to a person that are conditioned on the obligation of the person to repay the funds, either on a specified date or on demand, usually with interest. The term includes a contractual obligation of a bank to advance by the bank on behalf of a person. The term does not include accrued but uncollected interest or discounted interest.”

According to NBE (2012) Ethiopian commercial banks classify their loans as pass, special mention, substandard, doubtful and loss.

Pass: loans in this category are fully protected by the current financial and paying capacity of the borrower and not subject to any criticism. In general, any loan or advance, which are fully secured, both as to principal and interest by cash or cash substitutes, classified under this category regardless of past due status or other adverse credit factors.

Special mention: Short term loans past due for 30 days or more, but less than 90 days and medium and long term loans past due for 6 month or more, but less than 12 months.

Substandard: Short term loan past due for 90 days or more, but less than 180 days and medium and long term loans past due for12 months or more, but less than 18 months

Doubtful: Short term loan past due for 180 days or more, but less than 360 days and medium and long term loans past due for18 months or more but less than 3 years.

Loss: Short term loan past due for 360 days or more, and medium and long term loans past due for 3 years or more.

As per NBE (2012 p.3) NPLs are defined as "loans or advances whose credit quality has deteriorated such that full collection of principal and/or interest in accordance with the contractual repayment terms of the loan or advances in question".

Substandard, doubtful and Loss indicative the availability of nonperforming loan respectively due to the degree of collection or repayment enter in to doubt and difficulty.

Provisioning requirements for loans: NBE requires all Ethiopian commercial banks holding provisions for each loan to absorb the potential losses in their loans portfolio which shall be created by charges to provision expense in the income statement and shall be maintained at a level adequate to absorb potential losses in the loans or advances portfolio. The provisions for loan losses account always have a credit balance. Additions to or reductions of the provisions for loan losses account should be made only through charges to provisions in the income statement at least every calendar quarter. Banks are required to maintain the following minimum provision percentages against the total outstanding principal balance of each loan or advance classified .As per the (NBE 2012) the provision for impairment losses are determined as (Table 1.1.)

NO	Loan Category	provision required
1	Pass loans	1%
2	Special mention loans	3%
3	Substandard loans	20%
4	Doubtful loans	50%
5	Loss loans	100%

Source: NBE Directive no SBB/52/2012

1.3 Statement of the problem

Loan represents the majority of bank's assets and contributes significantly to income of commercial banks usually 85% of commercial banks income from interest on loans (Uppal 2009). Loan is the main function and vital source of revenue for Ethiopian commercial banks (ECBs). ECBs, from total revenue, interest income take a lion share. According to financial data of Zemen Bank, Dashen Bank and Abyssinia Bank for the period end of 2016 interest income contains the highest percentage share amounting 52%, 56 % and 67.2% of total revenue respectively. This credit creation and loan disbursement process exposes the banks to high default risk which might lead to financial distress including bankruptcy because of NPLs. Very important indicator of the financial risks of the commercial banks is credit risk connect directly with the level of NPLs (Ali 2013). NPLs indicate the borrowers are not paying their principal and interest properly as per their payment schedule, unable to meet their current financial obligation when borrowers fail to repay their loan amount. NPL considered as one of the main cause of financial crises banking failure and impair the profitability of bank. Thus, NPL are likely to hamper economic growth and reduce the economic efficiency (Hou 2007)

NBE imposed restriction on the proportion of NPLs not to be exceed 5% of their total loan outstanding (NBE 2012). After the restriction the NPLs of ECBs have shown improvement. However, according to Mehari (2012) reduction of NPLs in ECBs is not resulted from improved credit risk controlling, measuring and monitoring system. Rather, by writing off and

restructuring of loans. For instance (NBE 2016) announced that coffee trader loan faced repayment problem and order ECBs to reschedule their loan. Evident to this Dashen bank faced repayment problems totaling Birr 446,658,898 rescheduled the payment at 30 June, 2016.Both writing off and restructuring of NPLs is a post active measurement (Tsige 2013). The issue of preventing NPLs in ECBs is still in question. Banks are not fulfilling the maximum (5%) allowable limit of NPLs. For instance, in 2013 and 2014 NPLs of Zemen Bank was 8.52% and 8.83% respectively (ZB 2014). Additionally, in 2010 NPLs of Co-operative Bank of Oromia and Nib International Bank was 14.58% and 7.37% of their total loans respectively. The amount of NPLs fluctuates year to year for example in 2014, 2015 and 2016 NPLs of CBE was 1.4%, 1.8% & 2.5% respectively (CBE 2016). The findings of the different studies conducted on the determinant of NPL are inconsistent each other depend on the economic condition, the credit policy and the general situation in which the banks operate. Ethiopian commercial banks have their own unique nature such as high dominance of state bank, infancy of banking industry, restriction of foreign bank and unavailability of capital markets.

These problems and knowledge gap as presented in chapter two necessitated the conduct of this study focusing on the assessment of determinants of non-performing loans in Ethiopian commercial banks.

1.4 Objectives and Hypotheses

The broad objective of the study is to investigate the factors affecting non-performing loans of commercial banks in Ethiopia. Based on this broad objective the following hypotheses (H) were developed.

H1.Loan to deposit ratio has a significant positive relationship with Nonperforming loans of Ethiopian commercial banks.

H2.Net interest margin has a significant positive relationship with Nonperforming loans of Ethiopian commercial banks.

H3. Capital adequacy ratio has significant negative relation with Nonperforming loans of Ethiopian commercial banks.

H4. Return on equity has a significant negative relationship with Nonperforming loans of Ethiopian commercial banks.

H5.Loan loss provision has a significant positive relation with Nonperforming loans of Ethiopian commercial banks.

H6.Gross domestic product has significant negative relationship with Nonperforming loans of Ethiopian commercial banks.

H7.Unemployment rate has significant positive relationship with Nonperforming loans of Ethiopian commercial banks.

1.5 Significance of the study

This study is significance to policy makers, commercial banks and future research in the following ways. First, a clear understanding of the factors that affect the non-performing loans is expected to enable commercial banks to develop effective management strategies to increase their performance and to reduce nonperforming loan simultaneously. Second, the results are expected to enable the government to make appropriate decisions to improve commercial banks nonperforming loan. Third, the study will contribute to the existing literature by investigating the factors that affect non-performing loans.

1.6 Scope of the study

The objective of study is to examine the determinant of NPL of commercial banks in Ethiopia. The study employed eleven years unbalanced panel data from 2006-2016 and selected the following nine Ethiopian commercial banks; Commercial Bank of Ethiopia, Dashn Bank, Zemen Bank, Wegagen Bank, Awash International Bank, Bank of Abyssinia, Cooperative Bank of Oromia, United Bank and Nib International Bank. From the sampled banks Zemen bank has only Eight years data. However, Zemen banks have highest credit disbursement share and unique nature compare to other recent commercial banks enter in to the industry. The samples are selected based on registration period and credit disbursement share of Commercial banks. Banks registered before 2010 at national bank of Ethiopia and their credit share above 2%.

The study relied on secondary data and limited to five bank specific (loan to deposit, loan loss

provision, net interest margin, capital adequacy and return on equity) and two macroeconomic factors (real gross domestic product and unemployment) in nine Ethiopian commercial banks.

1.7 Organization of the thesis

This study is organized in five chapters. The first chapter discussed the background of the study, statement of the problem, research objectives and hypothesis, significance of the study, scope of the study and organization of the study. The second chapter provides the literature review which constitutes theoretical and empirical literature. Methodology of the research and the research design employed, the sampling method, data collection methods, and the data analysis technique presented under chapter three. The fourth chapter presents the results and discussion of the study. Lastly, the fifth chapter presented conclusion and recommendations.

CHAPTER TWO: LITERATURE REVIEW

This chapter presents the literature review on Nonperforming loans and their determinants. The chapter is organized in to three sections. Section 2.1 present the theoretical review related to NPLs, section 2.2 reviews the empirical evidence on determinant factors of NPLs and Presents conceptual frame work in to section 2.3.Lastly, present the conclusion and knowledge gap under section 2.4.

2.1. Theoretical review

Banks play a key role in improving economic efficiency by transferring funds from resource surplus unit to have better productive investment opportunities. Commercial banks are considered the most important financial transactions facilitator in any country's economy and the principal source of credit (Rose 2002). They serve as a bridge between surplus finance and scares finance by collecting funds from savers in the form of deposit and provide loans for borrowers that generate higher return more than interest pays for depositor (Mccarthy et al. 2010). In fewer developing countries, like Ethiopia, financial sector is dominated by banking industry but the banking industry is infant and one of under-banked economy in the world (Eshete et al. 2013). For developing countries, improvements in the banking sector could have significant impact on the allocation of financial resources since the sector is still the most important source of financing investment where financial markets underdevelopment (Sufian and Habibullah 2010). In this respect, effective and efficient functioning of the Banks has significant role in accelerating economic growth.

Loans are the basic asset that generate the largest share of operating income and represent 50-75 percent from total amount of assets at most banks. On the opposite direction, loan if not managed properly it represents the banks greater risk exposure (Mac Donald and Koch 2006). According to Wei-shong et al. (2006) the administration of loan portfolios seriously affects the profitability of banks since the major portion of gross profit of the banking industry is earned from loans.

According to (NBE 2008) Article (4.6) loans and advances are defined as, "any financial assets of a bank arising from a direct or indirect advance (i.e. unplanned overdrafts, participation in a

loan syndication, the purchase of loan from another lender etc.) or commitment to advance funds by a bank to a person that are conditioned on the obligation of the person to repay the funds, either on a specified date or on demand, usually with interest. The term includes a contractual obligation of a bank to advance by the bank on behalf of a person. The term does not include accrued but uncollected interest or discounted interest." A loan or credit facility refers to a contractual promise between two parties where one party, the creditor agrees to provide a sum of money to a debtor, who promises to return the amount to the creditor depend on agreement period of time. According to Walter (1991) at any time a bank is likely to have some loans in each of the following four categories:

Good loans: The borrower is making scheduled interest and principal payments and the bank has no reason to suspect that the borrower will not pay back the loan in full.

Loans past due or otherwise in doubt: Scheduled interest or principal payments have been missed or the bank has some other information indicating that repayment of the loan is in doubt.

Written-down loans: The bank has removed some of the face value of the loan from its books because it believes it will be able to collect only a portion of the loan.

Charged-off loans: The value of the loan has been completely removed from the bank's books, because the bank believes it will be able to collect little or nothing from the borrower.

Lending is not an easy task for banks because it created a big problem which is called NPLs. Due to the nature of their business, commercial banks exposed themselves to the risks of default from borrowers and NPLs are closely associated with banking crises (Waweru and Kalami 2009). Heffernan (2005) stated that the failure of the commercial banks' clients to repay their obligations caused the emergence of NPLs and is considered the most serious financial problems facing commercial banks. The failure of the commercial banks' clients to repay their obligations caused the emergence of NPLs and is considered the most serious financial problems to commercial banks (Shelagh 2005).

Available literature gives different descriptions of bad loans. Some use quantitative criteria like number of day overdue scheduled payments while other countries rely on qualitative norms like information about the customer's financial status and management judgment about future payments (Bloem and Gorter 2001). Alton and Hazen (2001) described non-performing loans as

loans that are ninety days or more past due or no longer accruing interest. IMF (2009) defined a non- performing loan as any loan in which interest and principal payments are more than 90 days overdue or more than 90 days' worth of interest has been refinanced. Non- performing loans are defined as defaulted loans which banks are unable to generate profit. They are loans which cannot be recovered within stipulated time that is governed by the laws of a country (Patersson and Isac 2004). NPLs refer to loans or advances whose credit quality has declined such that full collection of principal and/or interest in reference to contractual repayment conditions of the loan or advances is due and uncollected for 90 (ninety) consecutive days or more away from the scheduled payment date or maturity. They are known as non-performing because the loan ceases to "perform" or produce income for the bank (Adhikary 2006). According to Berger and De Young (1997) such loans injurious to the financial performance of banking institutions.

As per NBE (2012 p.3) NPLs are defined as "loans or advances whose credit quality has deteriorated such that full collection of principal and/or interest in accordance with the contractual repayment terms of the loan or advances in question".

Nonperforming loan has forced commercial banks to reduce the number of new loans and loan portfolio growths not only lead to a potential failure of the banking system but also damage the economic growth. The reduction of asset quality is the main predictive of banks insolvency (Ahlem and Fathi 2013). Banks disclosure of NPLs on their financial statement leads to lose confidence, deposit reduction, difficult to raise capital. NPL is foundation for the creation of liquidity and credit risk.

According to Fofack (2005) NPL is the dominant case for economic and bank crisis. Deterioration in banks' loan quality is one of the major causes of financial fragility. Greenidge and Grosvenor (2010) argued that the magnitude of NPLs is a key element in the initiation and progression of financial and banking crises. Guy and lowe (2011) argued that NPLs have been widely used as a measure of asset quality among lending institutions and is often related with failures and financial crises in both the developed and developing world.

Predominant theories of non-performing loans focus on different causes. These include risk premium, agent problem, adverse selection, moral hazard, patronizing effect, and asymmetric information.

Risk Premium theory: Financial decisions incur different degrees of risk. The "perceived credit risk" depends on a person's judgment. Risk and expected return move in tandem when the expected return increases also the risk increase. According to Ewert et al. (2000) the lender takes high risk to generate more return. This interest exposed for corresponding risk, it means that borrowers fail to pay their obligation when the interest rate is high.

Agency problem: There is a principal and agent relationship between shareholders and managers. Shareholders are the principals and managers are their agents. In theory managers should act in the best interests of shareholders, actions and decisions should lead to shareholders' wealth maximization but in practice on the reverse. This problem arises from managers give priority for self-interest, public perception and short term earning due to this take high risk. Conflict of interest between bank managers and shareholders may aggravate the adverse selection (Breuer 2006). According to Monaich (2013) possible mismatch of interest between shareholders and management holds due to asymmetries in earning distribution, which can result in the management taking too much risk.

Asymmetry Theory: Asymmetry theory holds that borrowers do not always provide all the information required. Even if they give the information differ from the reality of borrower current situation, generally borrower have accurate information about their projects more than the information disclosed for lenders. As a consequence, a lender could still be uncertain about the default risk of a loan contract and have difficulties in assessing controlling the nature and behavior of the borrower. Asymmetry theory indicates that lenders are unable to separate well from bad borrower (Richard 2011). Asymmetric information is the adverse selection issue. According to Arestis and Sawyer (2006) adverse selection problem occurs before the transaction takes place in the event that the lender's unable to know the real personality of the borrower. In

this respect, adverse selection and moral hazards have led to significant accumulation of Nonperforming loan in banks (Bester 1999).

Moral hazard theory: a situation in which one party gets involved in a risky event knowing that it is protected against the risk and the other party will incur the cost. It arises when both the parties have incomplete information about each other. Borrowers might ignore the moral implications, instead of doing right thing do what benefits them the most. Borrower lies and altered documents to make it appear as if borrowers were able to afford loans that they really couldn't afford. For example, sometimes inaccurate income numbers were reported, or no documentation was required to prove claims about ability to repay. It exposed for nonperforming loans. Moral hazard arises as a result of changes in the two parties' incentive after entering into a contract such that the riskiness of the contract is altered (Chengeta 2007). According to Keeton and Morris (1987) argues that banks with relatively low capital respond to moral hazard incentives by increasing the riskiness of their loan portfolio, which in turn results is higher non-performing loans on average in the future.

Patronizing effect theory: This model proposes that there is a possibility that lenders are unwilling to collect. Unwillingness may arise from several factors such as poor policies, procedures, structure, and rewards physical setting Shinaj and Mansur (2015). According to Islam et al. (2005) such internal problems led to accumulation of Nonperforming loans as they weaken management and motivate borrowers not to repay the loan, because they are confident that no serious action will be taken against them.

2.1.1 Five Cs of Nonperforming loan

According to MacDonald (2006) there are five Cs if not give attention contribute for the emergency of bad loan 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 and Koch 2006).

2.1.2. Determinant of nonperforming loan

Researchers set different determinant factors for NPLs depending on multidimensional aspects like economy and countries situation and give more emphasized for two grand factor bank specific and macroeconomic factors. Macroeconomic factors on external events such as the overall macroeconomic conditions which are likely to affect the borrowers' capacity to repay their loans while the Bank specific internal factor which attributes for the level of non-performing loans.

2.1.2.1 Bank specific determinants

Bank specific factor internal factor arise from inside of bank can be control by managerial decisions. The Several bank specific factor which the literature proposes as important

determinants of NPLs are net interest margin, capital adequacy, loan loss provision, loan to deposit ratio and return on equity (Rahman 2017 and Boudiga 2009).

Loan to Deposit Ratio: The loan to deposit ratio is affected by the operational strategy of a bank's management. Excessive rapid loan growth declined bank's capital levels and useful pointers the deterioration of banks financial health and can be employed as early warning indicators of future problem loans (Das and Ghosh 2007) As disclosed by Jimenez and Saurian (2006) loan growth is considered as one of the most important causes of problem loans. However, according to Sinkey and Greenwalt (1991) a rapid expansion of loan may not be a problem by itself, but such expansion leads to poor screening and lending to borrowers of inferior quality.

Net interest margin (**NIM**): is a measure of the difference between the **interest** income generated by banks and the amount of interest paid out to their lenders (deposits) relative to the amount of their interest-earning assets (loan). NIM measured as the difference between interest income and interest expenses, is widely regarded as an indicator of intermediation efficiency or the cost of intermediation (Raja and Sami 2015). These authors suggested that efficient intermediation is one of the most important functions of the banking system in supporting economic growth.

Capital adequacy: is an indicator of the ability of banks to provide funds for expansion and accepting risk loss caused by the operations of the bank. The difference between total assets and total liabilities is called capital. It is the amount of own fund available to support the bank's business and act as a buffer in case of adverse situation. It shows ability of the firm that liability could be privileged. Capital adequacy is the level of capital required by the banks to enable them withstand the risks such as credit, market and operational risks they are exposed to in order to absorb the potential loses and protect the bank's debtors. Capital adequacy is a measure of the overall financial strength of a bank. The higher the capital adequacy ratio, the higher the level of protection available to depositors and It is vital for maintaining soundness of the banking system since it acts as a cushion against panic or bank run or uncertainties (Keovongvichith 2012).

Return on equity: is the amount of net income returned as a percentage of equity. Return on equity measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested. Return on equity measure Profitability and offers clues about the ability of the bank to undertake risks and expand its activity. Banks return on equity increases reflect the risk taking behavior of bank managements and less stressed for revenue creation and less forced to engage risk credit offering business (Makri *et al*. 2014).

Loan loss provisions: are regarded as a controlling mechanism over expected loan losses. According to Hasan and Wall (2004) where provisions are triggered by default incidents on loans, higher levels of NPLs are associated with high rates of pro-visioning. At the same time, banks anticipating high levels of capital losses might create higher provisions to decrease earnings volatility and to reinforce medium term bank solvency.

2.1.2.2 Macroeconomic factors

Macroeconomic factors are events that affect the economy on a broader level influencing the economic outcome of large groups of people on nation or regional level and can't be controlled by bank management. The macroeconomic environment will encourage financial sector if it promotes overall economic growth. Therefore, instability in the macroeconomic is associated with instability in banking and financial markets and vice versa. The Several macroeconomic factors which the literature proposes as important determinants of NPLs are: real GDP growth, inflation rate, effective exchange rate, real interest rate, business cycle, unemployment rate, broad money supply (M2) and GDP per capita (Salas and Suarina 2002; Fofack 2005 and Jimenez and Saurina (2006).

Gross domestic product (GDP) is the best way to measure a country's economy. It includes everything produced by all the people and companies that are in the country. According to Salas and Suarina (2002) real GDP growth reflects the soundness and stability of an economy that will in turn enhances borrowers' capacity to repay their outstanding obligation and hence reduce the amount of NPLs.

Un-employment rate: is a phenomenon that occurs when a person who is actively searching for employment is unable to find work. Unemployment is often used as a measure of the health of the economy. This is based on the argument that an increase in the unemployment rate in the country negatively affects the incomes of the individuals which increases their debt burden (Bofondi and Ropele 2011; Vogiazes and Nikolaidu 2011).

2.2 Empirical Literature

Several empirical studies have been conducted regarding problem loans. For instance, Bercoff et al. (2002) examined the fragility of the Argentinean Banking system over the periods of 1993-1996 by using survival analysis. They argue that NPLs are affected by both bank specific and macroeconomic variables. Sinkey and Greenwalt (1991) also investigated the loan loss experience of large commercial banks in the US from 1984 to 1987 by using a simple log linear regression model. They found that both internal and external factors explain the loan loss rate of US banks. These researchers also found that there is a significant positive relationship between the loan loss rate and internal factors such as high lending rates, excessive lending, and volatile funds. In addition, they reported that depressed regional economic conditions also explain the loss rate of the commercial banks.

Similar study conducted on Spanish commercial and saving banks by Salas and Saurina (2002) using a dynamic model and a panel dataset covering the period 1985-1997, revealed that real growth in GDP, rapid credit expansion, bank size, capital ratio and market power explain the variation of NPLs.

Louzis et al. (2012) examined the determinants of NPLs in the Greek financial sector by using dynamic panel regression method for the period 2003-2009 that includes both a period of growth as well as the downturn. The study concluded that macroeconomic variables, specifically the real GDP growth rate, the unemployment rate and the lending rates have a strong effect on the level of NPLs.

Castro (2012) analyzed the link between the macroeconomic developments and the banking credit risk in a particular group of countries those recently affected by unfavorable economic and financial conditions such as Greece, Ireland, Portugal, Spain and Italy (GIPSI). Employing

dynamic panel data approaches to those five countries over the period 1997-2011. The result concludes that the banking credit risk is significantly affected by micro and macroeconomic variables. Specifically, GDP growth has a significant negative relationship with banks NPLs. On the other hand, NPLs of banks have a significant positive association with rises of unemployment rate, interest rate, credit growth increase and appreciation of real exchange rate

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 covered 2003 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.

Nkusu (2011) also conducted a study on NPLs and macroeconomic performance on a sample of 26 advanced countries from 1998 to 2009. The study investigated the macroeconomic determinants of NPL in panel regressions and confirms that adverse macroeconomic developments are associated with rising NPLs. The feedback between NPLs and its macroeconomic determinants is investigated in a panel vector autoregressive (PVAR) model. The findings of the study suggested that, deterioration in the macroeconomic environment such as adverse shock to GDP growth, higher inflation, unemployment or falling asset prices is associated with debt service problems, reflected into rising NPL.

Hyun and Zhang (2012) investigated the impact of macroeconomic and bank-specific factors of nonperforming loans in USA for two distinct sub-sample periods 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.

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 decreases 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.

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.

Jusoff et al. (2011) investigated the relationship between NPLs, interest rate and inflation rate in Malaysian banking sector for the period January 2006- December 2009. The study utilized a vector Error correction model (VECM) to determine whether interest rate and inflation rate may affect the NPLS based on 48 monthly data. The long run relationship shows that interest rate has a significant relationship towards NPL. On the other hand, there is no significant relationship between inflation rate and NPL. In the short run relationship, the finding shows that both inflation and interest rate cannot influence the NPLs in Malaysian commercial banking sector.

Ali (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, and 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.

Espinoza and Prasad (2010) attempted to ascertain the determinants of NPLs in the Gulf Cooperative Council (GCC) banking sector. The study used data drawn from 80 banks in the region over the period of 1995–2008. The result of multiple regressions models supported the view that both macroeconomic factors and bank-specific determine the level of NPLs. In particular, the study found strongly significant and inverse relationship between real GDP growth and NPLs. The study also showed that global financial market conditions have an effect on NPLs of banks. Among bank specific variables factors, efficiency and past expansion of the balance sheet were found to be significant. High credit growth in the past could generate higher NPLs in the future. Finally, larger banks would also have lower NPLs in GCC banking sector.

Ahmed and Bashir (2013) conducted a study on the macroeconomic determinants of nonperforming Loan of Banking Sectors in Pakistan. The study was conducted on 30 commercial banks from total of 34 banks in 1990-2011periods. The main aim of the study was to investigate impact of inflation, credit growth, GDP growth rate, Unemployment rate, consumer price index and lending/interest rate, on nonperforming loan. They found negative effect of lending rate and

GDP growth rate on NPLs. Their justification for negative association between lending rate and NPLs implies that as lending rate increase, individuals with funds starts saving with the banks to earn on their funds but investors with the profitable projects feel reluctant to borrow and invest. Besides, existing borrowers pay back their loans to keep their credit rating good as to get loans in the future at discount rates.

Pasha and khemraj (2009) determinants of non-performing loans in the Guyanese banking sector using a panel data set and a fixed effect model. Find that the real effective exchange rate has a significant positive impact on non-performing loans. This indicates that whenever there is an appreciation in the local currency the non-performing loan portfolios of commercial banks are likely to be higher. Empirical results show that GDP growth is inversely related to non-performing loans, suggesting that an improvement in the real economy translates into lower non-performing loans. Also find that banks which charge relatively higher interest rates and lend excessively are likely to incur higher levels of non-performing loans. No evidence supports the large banks are more effective in screening loan customers when compared to their smaller counterparts.

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

Jellouli (2009) conducted a study on bank specific determinants and the role of the business and the institutional environment on Problem loans in the Mena countries for the period 2002-2006.

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.

Rahman et al. (2017) assessed the Impact of Financial Ratios on Non-Performing Loans of Publicly Traded Commercial Banks in Bangladesh from 2010-2015. He applied an econometric model to find out correlations among financial ratios and a sample of 96 observations has been analyzed from 20 banks out of 30 listed commercial banks. The result indicates credit-deposit ratio and net interest margin have a positive influence on the non-performing loans and capital adequacy ratio and return on assets have a negative influence on the non-performing loans and sensitive sector's loan and priority sector's loan have significant positive influence on the non-performing loans and unsecured loans, profit per employee, and investment deposit ratio have significant negative impact on gross non-performing loan. Glen and Mondragon (2011) look at 22 advanced economies during the period 1996-2008 and find that the developments of loan loss provisions are driven mainly by real GDP growth, private sector leverage and a lack of capitalization within the banking system.

Fofack (2005) conducted a study on the determinants of NPLs during the economic and banking crises that affected a large number of countries in Sub-Saharan Africa in the 1990s. The study used correlation, causality analysis and pseudo-panel models based on data drawn from 16 African countries. The result revealed that both macro and microeconomic factors have significance association with NPLs of banks in Sub-Saharan African countries. The econometric analysis has shown a strong causality between NPLs and, economic growth, real exchange rate appreciation, the real interest rate, net interest margins and interbank loans. Specifically, the

dramatic increase in the size of NPLs is largely driven by macroeconomic volatility and reflects the vulnerability of undiversified African economies, which remain heavily exposed to external shocks. Macroeconomic stability and economic growth are associated with a declining level of NPLs; whereas adverse macroeconomic shocks coupled with higher cost of capital and lower interest margins are associated with a rising scope of NPLs. Interesting enough, inflation does not appear to be particularly significant in explaining the dynamics on NPLs

Boudiga (2009) empirically analyzed the cross-countries determinants of NPLs and the potential impact of regulatory factors on credit risk exposure. The study used aggregate banking, financial, economic and legal environment data for a panel of 59 countries over the period 2002-2006. The study used the ratio of NPLs as dependent variable. On the other hand, the independent variables include capital to risk-weighted assets minus the required minimum capital, one year lagged loan loss reserves to total loans ratio, one year lagged return on assets ratio, percentage of state-owned banks, percentage of foreign ownership, percentage of assets held by the five largest banks and one year lagged real GDP growth. The results imply that higher capital adequacy ratio and provisioning policy are correlated with a decrease in NPLs.

Aemiro and Rafisa (2014) the study examined the bank specific determinants of credit risk in Ethiopian commercial banks and quantitative research approach was adopted .A balanced panel data of 10 commercial banks both state-owned and private owned for the period 2007 through 2011 has been analyzed using random effects GLS regression. The regression results revealed that credit growth and bank size have negative and statistically significant impact on credit risk. Whereas, operating inefficiency and ownership have positive and statistically significant impact on credit risk. Finally, the results indicate that profitability, capital adequacy and bank liquidity have negative but statistically insignificant relationship with credit risk.

Negera (2012) assessed the determinants of nonperforming loans in Ethiopian commercial banks from 2005-2010. He used mixed research approach and Survey was conducted with professionals engaged in both private and state owned Banks in Ethiopia holding different positions using self-administered questionnaire, structured review of documents and records of 8

banks. Result of the study shows that poor credit assessment, failed loan monitoring, underdeveloped credit culture, lenient credit terms and conditions, aggressive lending, compromised integrity, weak institutional capacity, unfair competition among banks, willful default by borrowers and their knowledge limitation, fund diversion for unintended purpose, over/under financing by banks attribute to the causes of loan default. Consistent with Negera (2012) the study conducted by Meshesha (2015) revealed that poor credit analysis and unsound lending practices, lack of focused loan monitoring and follow-up, lenient credit terms and conditions, compromised integrity, and fund diversion are the major factors that contribute to loan default.

Tsige (2013) used a mixed methods research approach by mixed documentary analysis (structured review of documents) and in-depth interviews from 2000-2011 in eight commercial banks in Ethiopia to assess determinants of Non-performing loans (NPLs). The result of the study shows that, loan growth, financial performance, operational efficiency, effective exchange rate, inflation rate and gross domestic product have negative and statistically significant relationship with banks' NPLs. On the other hand, variables like bank size and state ownership have a positive and statistically significant relationship with banks' NPLs. However, the relationship for average lending rate and income diversification were found to be statistically.

Dula (2010) is study entitled Non-performing loan and its management: the case of Dashen Bank Mekelle Area identified ineffective loan monitoring and poor credit appraisal as the major factors accounting for non-performing loan from the lending institution side and lack of proper education on business area, lack of sufficient income, absence of sufficient infrastructure, lack of sufficient supervision from the bank, lack of saving account, high consumption expenditure and high interest charge as the causes for non-performing loan from the borrower side.

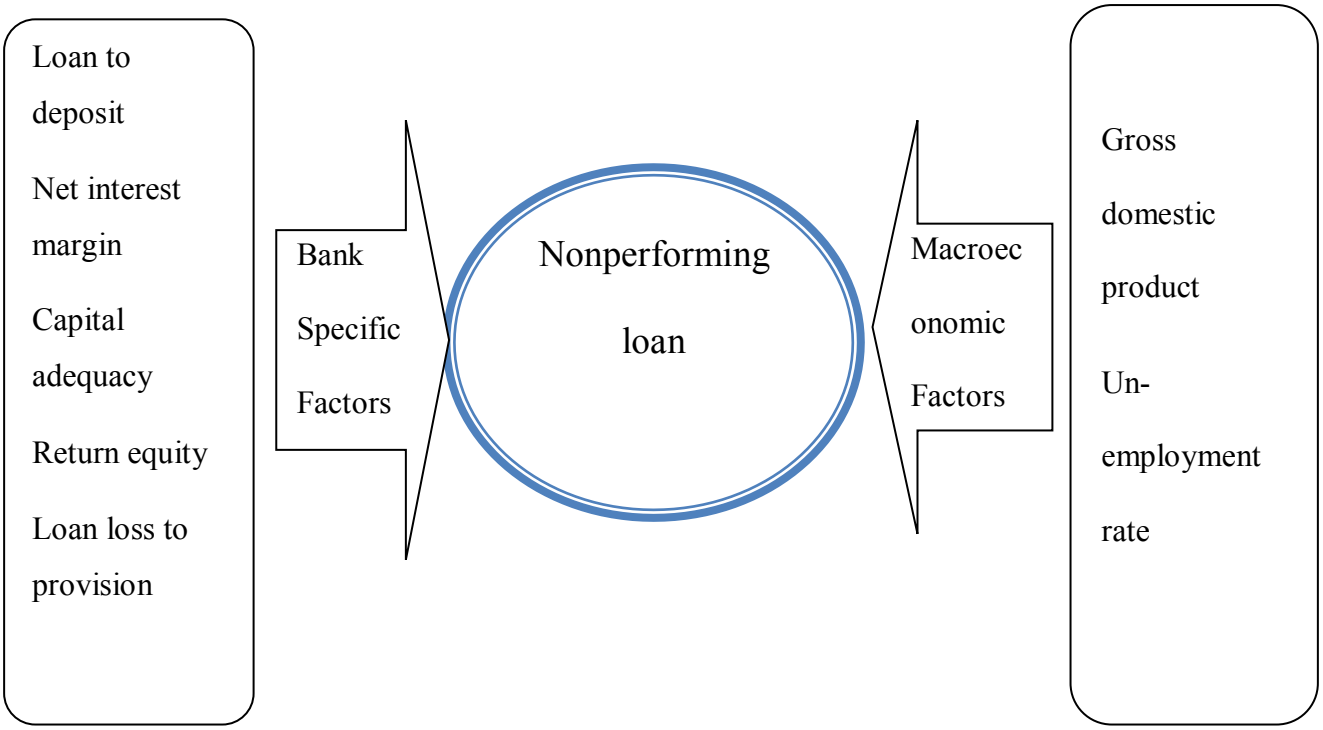
2.3 Conceptual Frame Work

The main objective of this study is to examine the determinants 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, return equity , net interest margin, loan loss provision , 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, unemployment rate and Gross domestic product (Farhan *et al.*2012; Shingjergji 2013; Sakiru *et al.* 2011; Ahmad & Bashir 2013; Saba *et al.* 2012; Louzis *et al.* 2012 and Negera, 2012).

The following conceptual model is framed to summarize the main focus of the study

Figure 2.1 Conceptual framework



Source: Developed by the researcher based on (Louzis et al. 2012; Tsige, 2012 and Farhan et al.2012)

2.4. Conclusions and knowledge gap

The literatures indicate NPLs are influenced by macroeconomic and bank specific factors. However, the impact of the variables differs depending on economic condition, political stability, loan policy etc. Most of the studies are conducted in developed banking industry. As knowledge of the researcher, limited number of literatures in Ethiopian banking industry has been conducted. For instance, Negera (2012) and Meshesha (2015) assessed the determinants of NPLs in Ethiopian commercial banks and considered only bank-specific variables in their study. However, macroeconomic variables were included and analyzed the effects could be appropriate since similar studies has demonstrated these variables have significant effect on NPLs. Dula (2010) concentrated on managing of NPL and the study used only one private bank does not consider other private and state bank have large amount of market share. The above three study used descriptive analysis and correlations matrix for the analysis thus method only provide simple summaries about the sample doesn't indicate the strength of the relationship between dependent and independent variables.

Ayalew (2009) observed the legal problems in realizing NPLs of Ethiopian banking sector. Tsige (2012) considered macroeconomic and bank specific factor such as loan growth, financial performance, operational efficiency, effective exchange rate, inflation rate, gross domestic product, bank size, state ownership, lending rate and income diversification. Several studies, conducted in different countries, indicate that a number of macroeconomic and bank specific variables explained the level of NPL. In this respect, as knowledge of the researcher, few of these determinant variables are considered in similar studies conducted so far.

Therefore, this study incorporated some of the significant determinants of NPL like net interest margin, unemployment, loan loss provision and deposit to loan ratio that are not considered in Ethiopian context. Generally, the study is expected to fill the existing literature gap in the area of the study by employing macroeconomic and bank specific factors and empirically examine their effect on NPLs of commercial banks in Ethiopia.

CHAPTER THREE: RESEARCH METHODOLOGY

The previous chapter present the literature review theoretical and empirical reviews on determinates of NPLs and identified the existing knowledge gap. This chapter discussed the methodology of the study. Under methodology section presented the hypothesis development, research approach, variables description, model specification and diagnostic test of CLRM assumption.

3.1 Hypotheses development

The objective of the study is to examine the determinant of Ethiopia Commercial Banks NPL. NPL is independent variable that can explain in different factors and its determinant classify into two bank specific and macroeconomic variables (Saba et al. 2012; Louzis et al. 2012; Boudriga et al. 2009 and Skarica 2013). The bank-specific variables are internal factors and controllable for bank managers while the macroeconomic variables are uncontrollable and external factor. Therefore, presented the bank-specific and macroeconomic variables related with hypothesis development under this section.

Loan to deposit (LTD) ratio: According to (Louzis et al. 2012 ; Makri et al. 2014 and Swamy 2012). LTD ratio has positive and significant effect on the level of NPLs of banking sectors. As disclosed by Jimenez and Saurian (2006) loan growth is considered as one of the most important causes of problem loans. According to Sinkey and Greenwalt (1991) a rapid expansion of loan may not be a problem by itself but such expansion leads to poor screening and lending to borrowers of inferior quality. In this respect the study expected positive relation with non performing loan.

H1. Loan to deposit ratio has a significant positive relationship with Nonperforming loans of banks.

Net interest margin (**NIM**): According to Rahman et.al (2017) interest margin a positive relationship with aggregate NPLs Such a positive relationship suggest that a high proportion of problem loans may cause banks to increase their interest margin to compensate for possible

default risks (Mendes and Abree 2003 and Carbo and Rodriguez 2007). The study expected positive relationship with NPLs

H2. Net interest margin have a significant positive relationship with Nonperforming loans of banks.

Capital adequacy (CAR); empirically, there is no consensus on the relation between capital adequacy and NPLs. Sinkey and Greenawalt (1991) show that banks with adequate capital ratio experience lower rates of NPLs. Other found positive relationship between NPLs and capital adequacy ratio. Banks with high levels of CARs might be encouraged to embark in riskier activities leading to riskier credit portfolios (Saba et.al. 2012 and Rime 2011). Makri et al. (2014) suggest that negative relationship with NPLs since CAR increase absorb a risky loan portfolio is marked by a high NPL. The study expected negative relation with NPLs.

H3. Capital adequacy ratio has significant negative relation with Nonperforming loans.

Return on Equity (ROE): Ahmed and Bashir (2013) and Makri et al. (2014) found negative relationships between ROE and NPLs, stipulating that more profitable banking sectors are better managed and more prudent in their granting of credit so that higher profitability in the past leads to a lower NPL ratio. Therefore, the study expected negative relationship between return equity and NPLs.

H4. Return equity have a significant negative relationship with Nonperforming loans.

Loan loss provisions (LLPs): According to Hasan and Wall (2004) where provisions are triggered by default incidents on loans, higher levels of NPLs are associated with high rates of pro-visioning. At the same time, banks anticipating high levels of capital losses might create higher provisions to decrease earnings volatility and to reinforce medium term bank solvency. The willingness of a bank to provision for loan losses is regarded as a strong belief in the future performance of the bank (Ahmad et al. 1999). The overall rate of provisioning reflects the general attitude of the banking system toward risk. According to Ahlem and Fathi (2013) and Hasni et al. (2014) loans loss provisions and non-performing loans positive and significant at the 1% level. Banks that anticipate high levels of capital losses may create higher provisions to

reduce earnings volatility and strengthen medium-term solvency. The studies expected positive relationship between NPL and LLP.

H5. Loan loss provisions have significant positive relation with Nonperforming loans banks.

Gross domestic product (GDP): Previous study indicated GDP significantly negative relationship with NPL (Saba *et al.* 2012; Louzis *et al.* 2012; Tsige 2013 and Fofack 2005). Their explanation that GDP enhancement reflect the economy growth and development when the economy growth increase the borrower income and able to pay their debit at payment period and it's contribute to lower NPLs. Fainstein and Novikov (2011) suggests that real GDP growth was the main driver of nonperforming loan ratios. Therefore, a drop in global economic activity remains the most risk for banks asset quality. Previous researcher's unveiled inverse relationship between GDP growth and the level of NPLs (Salas and Suarina 2002 and Hou 2007).This study expected a negative relationship between GDP and NPLs.

H6. Gross domestic product (GDP) has significant negative relationship with Nonperforming loans of banks.

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

H7. Unemployment rate have a significant positive relationship with Nonperforming loans bank

3.2 Research approaches

According to Creswell (2009) there are three types of research approach: the first one is **qualitative research** involves emerging questions and procedures, data typically collected in the participant's setting and its purpose is describing and understanding the phenomena. The approach makes considerable use of inductive reasoning. Qualitative research approach has five

common strategies of inquiry. The strategies include case study, ethnography, phenomenological study, grounded theory and content analysis.

The second one is **quantitative research**; is an approach for testing objective theories by examining the relationship among variables. These variables in turn can be measured, typically on instruments, so that numbered data can be analyzed using statistical procedures building in protections against bias, controlling for alternative explanations, and being able to generalize and replicate the finding (Creswell 2013). Quantitative research approach has two strategies of inquiry. The first is survey design which provides a quantitative or numeric description of trends attitude or opinion of a population by studying a sample of that population. From the sample the researcher generalizes about the population. The second type is experimental design used to test the effect of intervention on an outcome controlling all other factors which may influence that outcome. In experiment design researcher may also identify a sample and generalize to a population (Creswell 2009). Experimental designs are research approach for obtaining information about causal relationship and also allowing research to assess the correlation between one variable and another (Kothari 2004). The analysis is made based on deductive reasoning beginning with certain theory or hypotheses and drawing logical conclusions from it. The last one is **mixed method** research it is an approach that combines both qualitative and quantitative forms (Creswell 2009).

3.3 Research methods used

The aim of the study was to investigate the factors affecting NPLs of commercial banks in Ethiopia. The characters of the study examine derived hypotheses and specify the relationship among variables (typically in terms of magnitude or direction) rather than developing it. The study is an explanatory research that used quantitative research approach

Creswell (2013) discussed that explanatory studies unlike descriptive studies go beyond observing and describing the condition and tries to explain the reasons of the phenomenon. Explanatory research is devoted to finding causal relationships among dependent and

independent variables. It implies how and why variables should be related and the existence of or a change in one variable or cause leads to change in other variable.

This study used Quantitative approach, as it is the best approach to test hypotheses and to identify factors that influence on outcome (Creswell 2013). Quantitative approach specifies how and why the variables are interrelated and why independent variable, influence or affect a dependent variable non-performing loan so, the quantitative approach better provides and explain cause and effect relation. Quantitative approach can be expressed in terms of quantity and attempts to avoid bias in measurement by using standardized measurement tools in interpretation by using defined data categories. It measures what happens (reliable and objective) rather than how someone feels about what happens(subjective).It tests a sample and generalize a population Often reduces and restructures a complex problem to a limited number of variables (Creswell 2013). In short the quantitative approach tends to avoid subjectivity and stays impartial. In this respect the study being investigative in nature, using quantitative approach for data analysis would enable the study to observe independent variable has any impact upon the dependent variable (NPL of commercial banks in Ethiopia) or not. The study used Experimental (quantitative) designs for obtaining information about causal relationships, allowing to assess the correlation (relationship) between one variable and another with structured record reviews (documentary analysis) financial information collected from secondary data such as National Bank of Ethiopia publication, annual reports of the banks, central static agency and other relevant sources.

3.3.1 Sample design

The target population of the study all commercial banks registered by NBE. According to (NBE 2016) the country has one public-owned and sixteen private commercial banks which are operating throughout the country such as: Commercial bank of Ethiopia , Dashen Bank S.C, Awash International Bank S.C, Wogagen Bank S.C, United Bank S.C , Nib International Bank S.C , Bank of Abyssinia S.C , Lion International Bank S.C , Cooperative Bank of Oromia S.C , Berehan International Bank S.C , Buna International Bank S.C , Oromia International Bank S.C , Zemen Bank S.C , Addis International Bank S.C, Abay Bank S.C , Enat Bank S.C and Debub Global Bank S.C

The study used purposive non probability sampling method because purposive enables to use the researcher judgment to select sample and best to meet the research objectives. The sample ECBs selected based on registration period and credit disbursement share of Commercial banks. It is better to make generalization for the banking sector of the country based on data drawn from sample bank by mixing much more experienced with fairly experienced bank and had the highest credit share in the industry.

The study takes sample units of the nine commercial banks from the aggregate of seventeen commercial banks. Commercial Bank of Ethiopia, Dashn Bank, Zemen Bank, Wegagen Bank, Awash International Bank, Bank of Abyssinia, Cooperative Bank of Oromia , United Bank and Nib International Bank. Commercial Bank of Ethiopia is state owned and the rest are private commercial banks. The study employed eleven years unbalanced panel data from 2006-2016 because Zemen bank have only Eight years data however, Zemen bank had the highest credit share compare to other new comer commercial banks. Therefore, the study had 96 observations.

3.3 Variable description and Model specification

Nonperforming loan is the dependent variable of the study while the independent variable are gross domestic product, inflation, unemployment, net interest margin, capital adequacy ,loan loss provisions and loan to deposit Ratio .The study used Ordinary least squared (OLS) model to test the statistical significance of variables.

3.3.1 Definition of variables and their measurement

The operational definition of dependent and independent variable's presented under this section.

Dependent variable

Nonperforming loan: is any loan in which interest and principal payments are more than 90 days overdue or more than 90 days' worth of interest has been refinanced (IMF 2009).For this study the measurement of NPLs is according to NBE (2012) Substandard, Doubtful and Loss are consider as NPL. The NPL ratio measure how much of the bank loans and advances are becoming nonperforming. The amount of NPL ratio increases represents the low quality of bank asset. Nonperforming loan ratio is measured by nonperforming loan to total loan

Independent variable

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

Net interest margin: is the difference between interest income and interest expenses as a percentage of total loans and advances which includes deposits with foreign banks, treasury bills and other investments. Interest income results from variation between charges on loans and payment for deposits. NIM measured by net interest income divided by total earning asset.

Capital adequacy: it is the amount of Equity which holds against risky assets reserve to protect the depositors from any unexpected loss. It is expressed by total Equity to total asset ratio.

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

Loan loss provision: it is controlling mechanism over expected loan losses arising from lending business and protected against anticipated loss. It measured by the ratio of loan loss provision to total loan.

Real gross domestic product: is the best way to measure a country's economy. It includes everything produced by all the people and companies that are in the country. The variable measured by the annual percentage of real GDP.

Un-employment rate: is a phenomenon that occurs when a person who is actively searching for employment is unable to find work. The variable measured by annual percentage of unemployment rate.

Table 3.1 Summary of Variables measurement and expected relation between dependent and independent variables

Symbol	Explanation	Measurement	Expected sign
NPL	Nonperforming loan	NPL/Loan	
LTD	Loan to deposit ratio	Loan/Deposit	+
NIM	Net interest margin	NIM/Total asset	+
CAR	Capital adequacy	Total equity/Total asset	-
ROE	Return equity	Net income /Total equity	-
LLP	Loan loss provisions	LLP/Total loan	+
GDP	Gross domestic product	The annual GDP growth rate	-
UN	Unemployment rate	The annual unemployment rate	+

Source*: Developed by* the researcher

3.3.2 Model specification

Data collected from audited financial statement of commercial banks included in the sample and publications of NBE and CSA. Thus, collected data analyzed using descriptive statistics and multiple linear regression analysis. The descriptive statistics (Mean values and standard deviations) used to analyzed the general trends of the data from 2006 to 2016. A multiple linear regression model was used to determine the relative importance of each independent variable in explaining the variation of NPLs in ECBs. According to Hausman and Siekpe (2008) emphasize that regression methods have become an integral component of any data analysis concerned with describing the relationship between a response variable and one or more explanatory variables. Multiple regressions used in statistics to find the best fitting and most parsimonious, yet

reasonable model to describe the relationship between an outcome (dependent) variable and a set of independent (explanatory) variables. To explain the relationship between dependent and independent variable the following general multiple regression equations adopted

$Yit = \beta o + \beta Xit + \varepsilon it$

Where: -

Yit is non-performing loan for firm 'i' in year't'

β0 is the constant term

β is the coefficient of the independent variables of the study,

Xit is the independent variable for firm 'i' in year't' and

εit the normal error term.

The study uses the above general model to examine the determinant of NPL based on selected variables as follow**s:**

$NPLit=\beta 0 +\beta 1(LTD)it + \beta 2(NIM)it+ \beta 3(CAR)it + \beta 4(ROE)it+ \beta 5(LLP)it +\beta 6(GDP)it+ \beta 7(UN)it +\varepsilon it$

Where;

β0 is an intercept

β1, β2, β3, β4, β5, β6 and β7 represent estimated coefficient for specific bank I at time t,

LTD, CAR, NIM, LLP, ROE, GDP and UN represent Loan to deposit ratio, capital adequacy, and net interest margin, Loan loss provisions, return on equity, gross domestic product and unemployment respectively.

εit represents error terms for intentionally/unintentionally omitted or added variables.

The multiple linear regressions model was conducted by the OLS method using EVIEWS 9 econometric software package. According to Petra (2007) OLS outperforms the other estimators when the cross section is small and the time dimension is short. According to Brooks (2008) OLS or linear least squares is a method to estimate the slope and intercept in a linear regression model. Therefore, as far as the above facts true in the study used OLS method. The rational for choosing OLS is that, if the Classical Linear Regression Model (CLRM) assumptions hold true, then the estimation determined by OLS have a number of desirable properties, and are known as Best Linear Unbiased Estimators (Brooks 2008). The following section discussed CLRM

assumptions and their diagnostics test result.

3.3.3 Diagnostics test of Classical linear regression model assumptions.

According to Brooks (2008) five assumptions were made relating to the classical linear regression model (CLRM). Every estimation of the model should have to meet the OLS assumptions to be the estimation BLUE (Best Linear Unbiased Estimators).The following sections discussed the results of diagnostic tests (heteroscedasticity, autocorrelation, multicollinearity , normality and model specification test) that ensure whether the data fits the basic assumptions of classical linear regression model or not

.

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

Table 3.2: Result of Heteroskedasticity Test: ARCH

F-statistic	0.203311	Prob. F(1,89)	0.6532
Obs*R-squared	0.207406	Prob. Chi-Square(1)	0.6488

Source: Developed by the researcher through Eviews 9

As shown in table 3.2 ARCH test statistics indicate the p-values of F-statistic and Chi-Square 0.6532 and 0.6488 respectively. F-statistic and Chi-Square excess from significant level of 0.05. The p-values of F-statistic, Chi-Square suggest that no evidence for the presence of heteroscedasticity.

Autocorrelation: This is an assumption that the errors are linearly independent of one another (uncorrelated with one another). According to Brooks (2008) when the error term for any observation is related to the error term of other observation, it indicates autocorrelation problem

in the model. In the case of autocorrelation problem, the estimated parameters can still remain unbiased and consistent, but it is inefficient. In this study to test for the existence of autocorrelation, the popular Breusch-Godfrey Serial Correlation LM Test was employed.

Table 3.3: Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.514146	Prob. F(2,84)	0.0870
Obs*R-squared	5.309093	Prob. Chi-Square(2)	0.0703

Source: Developed by the researcher through Eviews 9

As shown in 3.3, the p value is 0.0703 which is greater than significance level of 0.05. F and $\chi 2$ statistic test indicate that the model does not evidence for the presence of autocorrelation problem. It can be concluded that do not reject the null hypothesis (H0)

Multicollinearity: An implicit assumption that is made when using the OLS estimation method is that the explanatory variables are not correlated with one another According to Brooks (2008) Multicollinearity occur when the independent variables are highly correlated with one another. If the multicollinearity occurs, the regression model is unable to tell which independent variables are influencing the dependent variable. To test the presence of multicollinearity problem the study used a correlation matrix.

Table 3.4: Results of multicollinearity Test: Correlation matrix of explanatory variables

	NIM	LTD	LLP	CAR	ROE	GDP	UM
NIM	1.000000	0.180393	-0.253886	0.079272	-0.273247	-0.181950	-0.044697
LTD	0.180393	1.000000	-0.212783	0.546052	-0.384766	0.267052	0.048522
LLP	-0.253886	-0.212783	1.000000	-0.234172	0.147464	0.253107	0.067637
CAR	0.079272	0.546052	-0.234172	1.000000	-0.595179	0.062215	0.013172
ROE	-0.273247	-0.384766	0.147464	-0.595179	1.000000	0.082486	-0.099317
GDP	-0.181950	0.267052	0.253107	0.062215	0.082486	1.000000	0.096968
UM	-0.044697	0.048522	0.067637	0.013172	-0.099317	0.096968	1.000000

Source: Developed by the researcher through Eviews 9

Table 3.4 showed that there is no strong correlation between the explanatory variables (GDP, UN, LTD, CAR, NIM, LLP and ROE).In this study the highest correlation coefficient is -0.595179 between return equity and capital adequacy rate of banks . Guajarati (2004) suggests that any correlation coefficient above 0.8 could cause a serious multicollinearity problem leading to inefficient estimation and less reliable results. All variables have low correlation and the result suggest that no evidence for multicollinearity problem between the selected explanatory variables.

Normality: A normal distribution is not skewed and is defined to have a coefficient of kurtosis 3. Jarque-Bera formalizes this by testing the residuals for normality and testing whether the coefficient of skeweness and kurtosis are zero and three respectively. Skewness measures the extent to which a distribution is not symmetric about its mean value and kurtosis measures how far the tails of the distribution. This study used Jarque-Bera Test (JB test) to find out whether the error term is normally distributed or not.

Table 3.5: Result of Normality Test: Jarque -Bera test

	Probability (P-value)	Decision Rule p <0.05
kurtosis	**2.882431**	Do not Reject the H0
Jarque-Bera Test	**0.655573**	

Source: Developed by the researcher through Eviews 9

As shown in the Table 3.5 indicated that distribution of the panel observation is symmetric about its mean. Kurtosis closes to 3 (i.e. 2.882431), and Jarque-Bera statistic has a P-value of 0.65 implies that the p-value for the Jarque-Bera test is greater than 0.05 which indicates that there was no evidence for the presence of abnormality in the data. Thus, the null hypothesis that the data is normally distributed should not be rejected

Ramsey RESET tests: which is a general test for misspecification of functional form. According to Brooks (2008) Specification error occurs when omitting a relevant independent

variable, including unnecessary variable or choosing the wrong functional form, so that regression model will be wrongly predicted. If the omitted variable is correlated with the included variable, the estimators are biased and inconsistent. If the omitted variable is not correlated with the included variable, the estimators are unbiased, consistent and model specification error will not occur. Ramsey-RESET Test employed to test the developed model is correct or not.

Table 3.6: Result of model specification Test: Ramsey-RESET test

Ramsey RESET Test
Equation: UNTITLED
Specification: NPL NIM LTD LLP CAR ROE GDP UM C
Omitted Variables: Squares of fitted values

	Value	Df	Probability
t-statistic	0.386257	85	0.7003
F-statistic	0.149195	(1, 85)	0.7003

Source: Developed by the researcher through Eviews 9

From table 3.6 it can be concluded that this research do not reject null hypothesis (H0), since the p value is 0.7003, which is greater than significance level of 0.05. Thus, it can be concluded that the model specification is correct in sample period Overall reliability and validity of the model.

Random Effect versus Fixed Effect Models: Econometrics model used to examine the impact of Loan to deposit ratio, Net interest margin, Capital adequacy ratio, Loan loss provision, Return on equity, Growth domestic product, Unemployment on nonperforming loans of Ethiopia commercial banks was panel data regression model which should be either fixed-effects or random-effect model. The study used Hausman Specification Test to identify whether fixed effect or random effect model is a appropriate for study.

Table 3.7: Result of model selection Test: Hausman test

Correlated Random Effects - Hausman Test

Equation: Untitled

Test period random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Period random	2.867535	5	0.7204

Source: Developed by the researcher through Eviews 9

As shown in Table 3.7, the Hausman specification test for this study has a p-value of 0.7204 for the regression models. This indicates that p-value is not significant and then the null hypothesis is not rejected justifying as random effect model is appropriate for the given data set in this study.

3.4 Conclusion and summary of the link between hypotheses and data sources

The methodology section describes the behavior of study and the method used to achieve the general objective of the study also discussed the independent and dependent variable related with developed hypothesis. The objective of study investigates the determinant of nonperforming loan and the characters of the study examine derived hypotheses and specify the relationship among variables rather than developing it. The study is explanatory type research and its employed quantitative approach with experimental strategy of enquiry and use secondary data to achieve the general objective. Sample design select nine bank from seventeen banks registered by NBE depend on their operation period and credit disbursement share. The multiple linear regressions model was conducted by the ordinary listing square and CLRM assumptions test of the models does not evidence for the presence of normality, heteroscedasticity, multicolinearity and autocorrelation problem.

Table 3.8 Link between research hypotheses, variables and data sources

HP NO	Hypotheses	Variables	Data sources	Specific data item
1	Loan to deposit affect NPLs	NPLs and LTD	Banks' financial statements and NBE's annual reports	From annual financial statement and un published report
2	Net interest margin affect NPLs	NPLs and NIM		From annual financial statement
3	Return equity affect NPLs	NPLs and ROE		
4	Capital adequacy affect NPLs	NPLs and CAR		
5	Loan loss provision affect NPLs	NPLs and LLP		
6	Growth domestic product affect NPLs	NPLs and GDP	NBE annual report	Annually average rate
8	Unemployment affects NPLs	NPLs and UN	Central static agency(CSA)	Annually average unemployment rate

Source*: Developed by* the researcher

CHAPTER FOUR: RESULTS AND DISCUSSION

In the preceding chapters important literatures relating to the topic were reviewed that gives enough understanding about the topic and identified the knowledge gap on the area. To meet the broad research objective and to test research hypotheses the method used for this study discussed under the research methodology chapter.

This chapter deals with the finding and discussion of the result in order to achieve research objectives and set a base for conclusion. The first section 4.1 of this chapter was mainly start with the explanation for study variables and discussed the result of descriptive statistics then presented the regression analysis in detail under section 4.2. Finally set a conclusion for the chapter under section 4.3.

4.1. Descriptive statistics

The summary of descriptive statistics that was intended to give general descriptions about the data (both dependent and independent variables) is presented in Table 4.1. The dependent variable nonperforming loans and the independent variables were classified into two, the macro economic factors (gross domestic product and unemployment) and bank specific were (loan to deposit, loan loss provision, capital adequacy, return equity and net interest margin) which were used to see the impact of on non performing loan . The total number of observation for each variable was 96. Accordingly, mean, median, standard deviation, minimum and maximum values of each variable were used so as to show the overall trend of the data over the period under consideration.

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

Variable	Observations	Mean	Median	Max	Min	Standard deviation
Non-performing loans	**96**	4.49	3.36	22.45	0.17	. 3.60
Loan to deposit ratio	**96**	62.80	59.40	129.60	30.00	15.30
Net interest margin	**96**	5.082	4.69	13.00	0.500	2.39
Capital adequacy ratio	**96**	13.16	12.17	54.46	4.20	5.94
Loan loss provision	**96**	3.50	2.60	21.47	0.79	3.02
Return on equity	**96**	27.33	25.68	77.71	-20.20	15.00
Gross domestic product	**96**	10.32	10.40	11.80	8.00	1.11
Unemployment rate	**96**	16.44	17.10	20.40	4.50	4.01

Source: Financial statements of sampled commercial banks, NBE report, CSA reports and Developed by the researcher through Eviews 9

As can be seen from table 4.1 for the total sample, the mean of NPLs was 4.5% with a minimum of 0.17% and a maximum of 22.45 %. The mean value suggest that from the total loan Ethiopian commercial banks disbursed on average 4.5% were being default or uncollected over the sample

period and 4.5% average NPL is close to the NBE set maximum requirement limit of NPLs ratio which is 5%.The disparity between the minimum 0.17% and the maximum 22.45% of NPLs indicated the margin that NPLs ratio of Ethiopian commercial banks ranged over the sample period. The standard deviation 3.06% of NPLs shows the variation of NPLs and loan recovering capacity among Ethiopian commercial banks.

Regarding bank specific independent variables, as stated in the above table 4.1, Loan to deposit indicate how far the bank used the depositors fund on credit activity which is prone to default risk .The mean value of Loan to deposit was 62.80% with the highest standard deviation of 15.3% . The average 62.80 % shows that ECBs provide on average 0.63 cent loan from one birr collected deposit. The maximum and minimum was 129.6 % and 30% respectively, suggesting that the ECBs concentrate on lending business which is exposed to risk uses depositors' money. The maximum value also raises a surprise on how banks lend excess of their total loan and engaged in high risk taking activity.

The mean value for net interest margin was 5.08 % whereas the maximum level was 13% and minimum one was 0.5% with a standard deviation of 2.39 %. The highest NIM indicates that interest income is greater than the interest expense and most profitable bank earned 0.13 cent from the one birr of total asset.

Capital adequacy ratio shows the proportion of owner's equity to total asset. The mean value for capital adequacy ratio was 13.16% whereas the maximum level was 54.46% and minimum one was 4.2% with a standard deviation of 5.93 % .The average amount of capital adequacy is greater than the minimum capital requirement 8% of the NBE showing that EBCs has ability to bear loss results from loan default.

The mean value of return on equity was 27.32% with the highest 77.7% and the lowest -20.2%. That means, the most profitable bank of the sample commercial banks earned 0.77 cents of net income from a single birr of equity investment and the minimum profit earned by one of the sample banks was a net loss of -0.2 cents on each birr of equity investment. The minimum return gain registered by late comer commercial banks because new banks enter in to the industry only has shareholder contribution also the operation is not started generate income actively . The mean of 27.32 % showed that, Ethiopian commercial banks earned 0.27 cents on average for

each one birr capital investment over the sample period. The average returns on equity suggest that ECBs had been producing good return for their owner during the period under study. Return on equity revealed the second highest standard deviation 15 % from its mean compared to other bank specific variable. This indicates the existence of high variation among Ethiopian commercial banks in terms of their return to capital investment.

Loan loss provision shows the default risk that the bank expects to sustain from lending business. The mean value of Loan loss provision 3.5% where as the maximum level was 21.46 % and minimum one was 0.78% with a standard deviation of 3.01%.

Among macroeconomic variables the study employed unemployment and GDP. The mean of unemployment is 16.44 % with minimum of 4.5% and maximum of 20.40 %. Unemployment had a higher standard deviation compare to GDP which was 4.01% this implies that unemployment rate in Ethiopia during the study period remains unstable compare to GDP. The average GDP growth in Ethiopia for the sample period was 10.31% with a standard deviation of 1.11% implies the economic growth in Ethiopia during the sample period remains stable as compared to the unemployment rate.

4.2. Regression results and discussions

The empirical evidence on the determinants of Ethiopian commercial banks' non-performing loan is studied based on unbalanced panel data, where all the variables are observed for each cross-section and each time period. The study has a time series segment spanning from the period 2006 up to 2016 and a cross section segment which considered nine Ethiopian commercial banks, namely Commercial Bank of Ethiopia, Dashn Bank, Zemen Bank, Wegagen Bank, Awash International Bank, Bank of Abyssinia, Cooperative Bank of Oromia, United Bank and Nib International Bank. The study used multiple liner regression equation to analyze the relationship between Ethiopian commercial banks non-performing loan and determinant variables. All the proposed independent variables (i.e., NIM, LTD, ROE, LLP, CAR, GDP and UN) were regressed with respect to the dependent variable (NPLs). The following linear regression model is developed.

NPLit=β0 +β1(LTD)it + β2(NIM)it+ β3(CAR)it + β4(ROE)it+ β5(LLP)it +β6(GDP)it+ β7(UN)it + it +εit

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

Table 4.2: Result of Ordinary Least Square (OLS) Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NIM	-0.065676	0.106275	-0.617980	0.5382
LTD	0.047285	0.019401	2.437296	0.0169**
LLP	0.883077	0.084367	10.46713	0.0000*
CAR	-0.157864	0.055894	-2.824343	0.0059*
ROE	-0.044720	0.022119	-2.021767	0.0463**
GDP	0.253075	0.238909	1.059293	0.2924
UM	0.064983	0.057913	1.122089	0.2649
C	-1.676830	2.695384	-0.622112	0.5355
R-squared	0.662935	Mean dependent var		4.476492
Adjusted R-squared	0.635500	S.D. dependent var		3.624175
S.E. of regression	2.188054	Sum squared resid		411.7317
F-statistic	24.16342	Durbin-Watson stat		1.596299
Prob(F-statistic)	0.000000			

Source: Developed for the research through Eviews 9

Notes: *significant at 1%, ** and significant at 5%,

Table 4.2 shows that the value of the adjusted R-Squared is 63.6% which confirms that 63.6 percent of changes on dependent variable (NPL) are explained by independent variables of the

model, 63.6% is more than the conventional recommended rate of 60% . The value of F-statistic (24.16342) confirms the accuracy of the estimated model. F-statistics tests the null hypothesis that all of the slope parameters (β's) are jointly zero. Accordingly, the F-test result shows that the null hypothesis is rejected as the probability of F-stat is 0.0000. In other words, the change in deposit to loan, net interest margin, capital adequacy, loan loss provision, return on equity , GDP and unemployment rate collectively explain 63.6% of the variation in NPLs ratio of ECBs.

According to Table4.2 deposit to loan, capital adequacy, loan loss provision and return on equity are found to be significant variables of nonperforming loans in ECBs. On the other hand the findings revealed that there is statistically insignificant relationship between macroeconomic variables (gross domestic product and unemployment) and NPLs of Ethiopian commercial banks. The following section demonstrates the impact of each explanatory variable on Ethiopian commercial banks NPL.

4.2.1 Loan to deposit (LTD)

Table 4.2 showed that the coefficient of loan to deposit is 0.047285 and positively significant at 5% significant level. This means, holding other factors constant, an increase/decrease in Loan to deposit by one unit will result a 0.047285 increase/decrease of Ethiopian commercial banks NPL. Generally, reject the null hypothesis since there is a positive significant relationship between Loan to deposit and non-performing loans. This result is consistent with expected result for the study also conform the findings of (Swamy 2012; Rahman 2017; Jimenez and Saurian 2006 and Sinkey and Greenwalt 1991), although some studies such as (Makri et al. 2014; Saba et al. 2012; Louzis et al. 2010; and Ranjan and Chandra 2003) found that there is a negative relationship between LTD and NPLs.

A positive significant effect of loan to deposit on Ethiopian commercial banks of NPL suggest that borrower wants loan and gives priority to banks provide loan with high interest rate rather than not provide loan. Ethiopian commercial banks to spread their customer base and to increase their deposit use loan as an enticement to attract a new customer. The above mutual interest of lender and borrower contribute for the growth of lone to deposit ratio. The expansion of credit

may not be a problem by itself, but such expansion leads to poor screening and lending. Rapid credit growth contributes to lower credit standards bring higher problem loans in the future to Ethiopian commercial banks which may be due to poor screening (Aemiro and Rafisa 2014). Also the ECBs to hold their customer make easy the complicated loan procedure to their customer which means provide loan for high depositor and have more transaction with familiar rather than fulfilled written loan procedure criteria such as collateral are not balanced with provide loan and less supervised. Due to the above reason increase loan disbursement practice of Ethiopian commercial banks lead to increase the volume of NPLs.

4.2.2 Loan loss provision (LLP)

Table 4.2 showed that the coefficient of loan loss provision is 0.0883077 and positively significant. This means, holding other factors constant, an increase in loan loss provision by one unit will result in 0.0883077 increases in NPL of Ethiopian commercial banks. The magnitude of the coefficient estimate (0.883077) for LLP was the largest of all the variables used in the model. This indicates that, LLP had a great impact in explaining the variation of NPLs in Ethiopian commercial banks. The result is consistent with Ahlem and Fathi (2013) and Hasni et al. (2014).Generally, the study fails to reject the alternative hypothesis (Loan loss provision has a positive and significant effect on Ethiopian commercial banks NPL). Ethiopian commercial Banks that anticipate un collective loan may create provisions to reduce or absorb their risk this motivate Ethiopian commercial banks to provide more loan and engaged in risky activities and ultimately the probability that loans became NPLs will increased with the same manner. Therefore, the findings suggested that, loan loss provision of banks was a vital determinant of NPLs in Ethiopian commercial banks.

4.2.3 Capital adequacy (CAR)

Table 4.2 showed that the coefficient of Capital adequacy is -0.157864 and negatively significant relation with NPLs. The magnitude of the coefficient estimate (-0.157864) shows that CAR has a great impact in explaining the variation of NPLs in Ethiopian commercial banks, next to LLP. This negative sign indicates an inverse relationship between capital adequacy ratio and NPLs.

Thus, implies that for one unit change in the banks' capital adequacy ratio, keeping other thing constant had resulted 0.16 unit changes on the levels of NPLs in opposite direction. The result is consistent with Rahman (2017). However, the finding is inconsistent with the result of (Sinkey and Greenawlat 1991; Emmanuel 2014; Salas and Saurina 2002; Boudriga et.al. 2009; Ahmad and Ariff, 2007; and Makri et.al. 2014). Generally, the study fails to reject the alternative hypothesis (Capital adequacy has a negative significant effect on Ethiopian commercial banks of NPL). The result indicates that higher capital requirement protects Ethiopian commercial banks from providing loans to more risky projects. The capital increase improves the bank ability to with stand financial shocks. Ethiopian commercial banks if they have higher capital adequacy banks not interested for risky activity also high capital adequacy is measure the overall financial strength of a bank and indicator of efficient management .Efficient management leads to high screening, monitoring and controlling to borrowers of inferior quality (Negera 2012). If during the study period when Ethiopian commercial banks hold higher amount of capital, they had low non-performing loan and when they hold lower amount of capital, ECBs had high nonperforming loan.

4.2.4 Return on equity (ROE)

Table 4.2, indicates that there is a negative and statistically significant relationship between ROE and NPLs. The result shows negative effect of bank profitability measured in terms of ROE on NPLs with a coefficient of -0.044 and a p-value of 0.0463 at 5% significance level. This implies that for one unit changes in ROE, keeping the other things constant had resulted 0.44 unit change on the level of NPLs in opposite direction. This result confirms the finding of (Makri et al.2014; Boudriga et al.2009; Klein, 2013; Shingjerji 2013 and Ahmad and Bashir, 2013). This implies that deterioration of profitability ratio in terms of ROE leads to higher NPLs. Generally, the study fails to reject the alternative hypothesis (i.e. ROE is significant and negative relationship with Ethiopian commercial banks NPL). The result suggest that higher ROE percentage indicate that profitability of banks and proxy for efficiency management as this time Ethiopian commercial banks less engaged in risky activities and ultimately resulted with lower volume of NPLs

4.2.5 Net interest margin (NIM)

Table 4.2 indicates that there is statistically insignificant relationship between NIM and the level of NPLs with P-value of 0.5382, which is within unacceptable range (> 5%). This finding inconsistent with Shingjergji (2013).Generally, the study rejects the alternative hypothesis (i.e. there is insignificant and negative relationship between NIM and Ethiopian commercial banks NPL).The negative relation suggest that Ethiopian commercial banks interest margin increase not interested to inter in to doubt loan also high interest margin represent the strength of management.

4.2.6 Real gross domestic product rate (GDP)

Table 4.2, indicates that there is no statistically significant relationship between GDP and the level of NPls, with P-value of 0.2924, which is not within the acceptable range (5%). The finding of the study is consistent with Swamy (2012).The positive coefficient value of the estimate is consistent with the results of (Salas and Suarina, 2002; Fofack, 2005; Hou, 2006; Jimenez and Saurina, 2005; Pasha and Khemraj, 2009; and Louzis et al. 2010).Generally, the study rejects the alternative hypothesis (i.e. There is insignificant and negative relationship between GDP and Ethiopian commercial bank NPL).

4.2.7 Unemployment rate (UN)

Table 4.2 indicates that there is no statistically significant impact of UN on the level of NPLs with P-value of 0.253075, which is not within the acceptable range 5%. The finding of the study consistent is with Klein (2013).The positive coefficient value of the estimate is consistent with the results of Selma and Jouini (2013) and Louzis et al. (2010). Generally, the study rejects the alternative hypothesis (i.e. there is insignificant positive relationship between UN and Ethiopian commercial bank NPL).

4.3 Conclusion

This chapter discussed the results of descriptive and regression analysis regarding to the determinant factors of nonperforming loans of ECBs. The regression revealed that LTD, LLP,

ROE and CAR are statistically significant factors that determine the NPLs of commercial banks in Ethiopia. On the other hand, NIM, GDP and UN are statistically insignificant to explain Ethiopian commercial banks NPL. The expected sign and the finding of the study are summarized in the following table 4.3.

Table 4.3 Summary of actual and expected sign's of explanatory variable.

Hypothesis	Variables	Expected Signs	Actual Signs	Rejected/not rejected	AT significant level
H1	Loan to deposit ratio	Positive & Significant	Positive & Significant	Not rejected	5%
H2	Net interest margin	Positive & Significant	Insignificant	Rejected	_
H3	Capital adequacy	Negative & Significant	Negative & Significant	Not rejected	1% and 5%
H4	Return equity	Negative & Significant	Negative & Significant	Not rejected	5%
H5	Loan loss provisions	Positive & Significant	Positive & Significant	Not rejected	1% and 5%
H6	Real GDP growth rate	Negative & Significant	Positive & in Significant	Rejected	_
H7	Unemployment rate	Positive & Significant	Insignificant	Rejected	_

Source: Developed by the researcher.

CHAPTER FIVE: CONCLUSION AND RECOMMENDATION

In previous chapter presented descriptive and regression analysis to examined the determinant of NPL of Ethiopian commercial banks. This chapter discussed the conclusions and recommendations of the study. The chapter organized in to two sections, the first section 5.1 presents the conclusions of the study and section 5.2 presents the recommendations provide depend on the findings of the study and give highlights for further research.

5.1 Conclusion

The broad objective of the study was to investigate bank specific and macroeconomic determinants of NPLs in Ethiopian commercial banks. To achieve the broad objective of the study used quantitative research approach. The study applied descriptive statistics and multiple linear regression analysis to analyzed and identify the influences of bank specific and macroeconomic factor on non-performing loans of nine sampled Ethiopia commercial banks. A sample of 96 observations has been analyzed over the period from 2006-2016 and used unbalance panel data. Regression analysis and descriptive statistics were employed on secondary data collected from NBE, CSA and a sample financial statement of banks. The multiple linear regressions model was conducted by the ordinary listing square and CLRM assumptions test of the models no evidence for the presence of normality, heteroscedasticity, multicolinearity and autocorrelation problem. The study shows the cause-effect relationship between the bank specific, macroeconomic factor and non-performing loans of Ethiopian commercial banks. The study uses five bank specific variables and two macroeconomic factors such as Loan to deposit ratio, Net interest margin, Capital adequacy ratio, Loan loss provision and Return on equity, Growth domestic product and Unemployment. The findings of the study suggested the following conclusions.

The study suggested that ROE, CAR, LLP and LDT statistically significant effect on the level of NPLs. However, the regression model revealed the insignificant effect of NIM, GDP and UM on the level of NPLs of commercial banks in Ethiopia for the period under consideration.

The regression analysis of the empirical determinants of NPLs presented in this study suggested LTD, LLP, CAR and ROE are the major bank specific determinant of NPLs in Ethiopian commercial banks. The relationship of LTD with the volume of Ethiopian commercial banks nonperforming loan is positive. In this general setting, loan growth of a bank was key determinate of NPLs in ECBs. There is also a positive association between LLP and NPLs of Ethiopian commercial banks. Therefore Ethiopian commercial Banks that anticipate un collective loan may create provisions to reduce or absorb their risk this motivate Ethiopian commercial banks to provide more loan and engaged in risky activities and ultimately the probability that loans became NPLs will increased with the same manner. At the same time, NPL of Ethiopian commercial banks negatively affected by CAR and ROE. In particular, CAR negative relationship with NPLs of Ethiopian commercial bank. The result indicates that higher capital requirement protects Ethiopian commercial banks from providing loans to riskier projects. ROE also negatively association with NPL which means high ROE contributes to lower NPLs and suggests that the overall financial strength of a bank and indicator of efficient management. Better managed banks have on average better quality of assets because profitability of the banks increases the likelihood of managers engaged in risky lending activity decreases and ultimately reduce NPLs.

5.2 Recommendation

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

- Bank management should give attention for bank specific factor such as deposit, loan ,capital and their return, also must give more emphasis on the asset management decision and give priority for current asset specially loan in order to reduce the level of nonperforming loans.
- This study recommends that Ethiopian Commercial Banks to balance their loan in proportion with customers' deposit.

- Ethiopian commercial banks instead of provide much amount of loan to enhance their return, better to provide other services to increase their fee such as electronic fund transfer, providing locker facilities and preferable for commercial banks to concentrate or

diversify their credit portfolio to increase their return in order to reduce the level of nonperforming loans

- This study recommends future researcher to validate the consistency of the result and provide additional results by including other variables like priority sector loan, monitory policy and sensitive sector's loan

Reference

Abiodun, EC,hijoke ,M. & John ,N 2013, 'The *determinant of nonperforming loans in Nigeria*' ,An empirical analysis .International journal of advance research in statistics, management and finance, vol.1no.2

Adhikary, B.K. 2006, 'Nonperforming loans in the banking sector of Bangladesh', realities and challenges. *Bangladesh Institute of Bank Management*, 75-95.

Adriaan,M. and Russel, F 2015,'*The treatment of non-performing loans*.'*IMF Working Paper*, BOPCOM 05/29

Aemiro.T Rafisa.D 2014 "Bank- Specific Determinants of Credit Risk: Empirical Evidence from Ethiopian Banks". Research Journal of Finance and Accounting Vol.5, No.7, 2014

Ahmed, F &Bashir,T 2013,'*Explanatory Power of Macroeconomic Variables asDeterminants of Non-Performing Loans*',*Evidence Form Pakistan,* World Applied SciencesJournal 22 (2): 243-255, ISSN 1818-4952

Ahlem,S and Fathi,j 2013, '*Micro and Macro Determinants of Non-performing Loans'*International Journal of Economics and Financial IssuesVol. 3, No. 4, 2013, pp.852-8ISSN: 2146-4138

Ahmad, A.S, Takeda, C& Thomas,S 1999, '*Bank loan loss provisions: a reexamination of capital management earnings management and signaling effects*', Journal of Accounting and Economics, Vol. 28 No. 1, pp. 1-25.

Ahmed, S 2006, '*An investigation of the relationship between Non-performing Loans, Macroeconomic Factors, and Financial Factors in context of Private Commercial Banks in Bangladesh'*, Bangladesh

Ali, S 2013,'*Impact of Bank Specific Variables on the Nonperforming loans ratio in Albanian Banking System', Journal of Finance and Accounting*: Vol.4, No.7.

Alton, R G. & Hazen J. H. 2001, *'As Economy Flounders, Do We See a Rise in Problem Loans?'*accessed through www.stlouisfed.org/publications/re/articles/?id=404

Arestis, P & Sawyer, MC 2006 'A Handbook of Alternative Monetary Economics', *Cheltenham, Edward Elgar Publishing Ltd*

Ayalew, T 2009, '*Legal Problems in Realizing Non-Performing Loans of Banks in Ethiopia*', MA thesis, Addis Ababa University

Balasubramaniam,C 2013,'*Nonperforming assets and profitability of commercial banks in India*: Assessment and emerging issues'. ABHINAV Journal, 1, 7, 41-52.

Bercoff, J, Julian, G & Franque, G 2002, '*Argentinean Banks, Credit Growth and the Tequila Crisis: A Duration Analysis*'(Unpublished).

Berger, A & De Young,R 1997. '*Problem loans and cost efficiency in commercial banks'Journal of Banking and Finance*, 21: 8498,70.

Bester, H 1999'*Collateral Default Risk and Relationship Lending'*an empirical study on Financial Contracting.

Breuer, JB2006 '*Problem bank loans, conflicts of interest and institutions*', *Journal of Financial Stability,* Vol.2, No.3, pp. 226–285.

Bloem,M.A.& Gorter N.C 2001, '*Treatment of Non-Performing Loans in Macroeconomic Statistics',* IMF Working Paper, WP/01/209

Bofondi, M. and Ropele, T 2011 '*Macroeconomic Determinants of Bad Loans: Evidence from ItalianBanks*', Occasional Papers, 89

Boudriga, A 2009, '*Bank specific, business and institutional environment determinants of nonperforming loans: Evidence from Middle East and North African countries*', economic research forum, Cairo, Egypt.

Brooks, C 2008,'*Introductory Econometrics for Finance'*, 2nd edn, Cambridge University Press, New York.

Carbo V.S & Rodriguez, F 2007, '*The determinants of bank margins in European banking' Journal of Bankingand Finance, 31*(7), 2043-2063.

Caprio G and Klingebel, D 1999,'*Bank insolvencies cross country experience, world Policy*',Research Wording Paper 1574(washington).

Castro, V 2012 'Macroeconomic determinants of the credit risk in the banking system: The case of the GIPSI' University of Coimbra and NIPE, Portugal.

Chengeta, R 2007, '*Importance of banks in an economy*' (http://www.slideshare.net/R.Chengeta-Importance-of-banks-in-economy.com), site visited on10/02/2017

Creswell, JW 2009, '*Research design: quantitative, qualitative and mixed methods approaches',* 3rd edn, Sage Publications, California

Creswell, JW 2013 '*Research design; qualitative, quantitative, and mixed methods approaches',* 4th ed United State of America.

Dula,T 2010 '*Non performing loan and its management IN commercial bank in case of Dashen bank.'MEKELLE UNIVERSITY*, 2010.

Das ,Rs and Ghosh ,Hm 2007 "The effect of credit risk management on financial performance of the Jordanian commercial banks" Investment Management Volume 12, Issue 1, 2007

Eshete,Z.S,Teshome,K.W &Abebe,T.K. 2013,'*Competition in Ethiopian Banking Industry*. 'African Journal of Economics Vol. 1 (5), pp. 176-190

Espiloza, R& Prasad, A 2010, '*Nonperforming Loans in the GCC Banking System and their Macroeconomic Effects*', IMF Working Paper WP/10/224, International Monetary Fund

Ewert,R,Schenk,G and Szczesny,A 2000 '*Determinants of bank lending performance in Germany evidence from credit file data*'Schmalenbach Business Review 2000 : OCT, VOL. 52:4, p. 344-362

Fainstein, G and Novikov, I 2011 '*The Comparative Analysis of Credit Risk Determinants in theBanking Sector of the Baltic States*', Review of Economics and Finance, No. 3

Farhan M, Sattar A, Chaudhry A.B. & Khalil F 2012. '*Economic determinants of nonperforming Loans: perception of Pakistani Bankers'*, European Journal of Business Management, 4 (19), pp. 87-99.

Fofack, H 2005, 'Non-performing loans in sub-Saharan Africa: Causal Analysis andMacroeconomic Implications'. World Bank Policy Research Working Paper no 3769.

Greenidge, K. & Grosvenor, T 2010, '*Forecasting non-performing loans in Barbados'*. Journal of Business, Finance and Economics in Emerging Economies, *5*(1), 80-107.

Guy, K., & Lowe, S 2011,'*Non-performing loans and bank stability in Barbados'*. *Economic Review*, *37*(1), 77-82

IMF, 2009a. Initial lessons of the crisis. IMF Staff Paper 09/37.International Monetary Fund, Washington, DC.

Hailu, A. 2015,*'Determinant of credit risk in Ethiopian private commercial banks' ,International Journal of Accounting and Financial Management Research* ,Vol. 5, Issue 3, Jun 2015, 1-

Hasan, I., Wall, L.D. 2004, *Determinants of the loan loss allowance: some cross-countrycomparison.* The Financial Review, 39(1), 129-152.

HasniA. Ismail .A & Imbarine .B 2014 '*Loan Loss Provisions And Macroeconomic Factors: The Case Of Malaysian Commercial Banks',Faculty of Business Management, Universiti Teknologi Mara, Malaysia,* GTAR-2014, Vol. 1, 73-86

Hausma ,D and Siekpe, L 2008"The reason behind consumers' shopping motivations." *Journal ofbusiness research* 61 : 5-13

Hefferan, SA 2005, "Modern Banking", Chichester, Wiley

Hou, Y 2007, '*The Non-Performing Loans: Some Bank-level Evidences'*The 4th Advances in Applied Financial Economics, the Quantitative and Qualitative Analysis in Social Sciences conferences.

Hyun,J. and Zhang,L.2012,'*Macroeconomic and Bank-Specific Determinants of the U.S. Non-Performing Loans'. Before and during the Recent Crisis; Published thesis (MSc)*,Simon Fraser University

Islam, M.S., Shil, N.C & Mannan, A.M 2005.'*Non-performing loans – its causes, consequences andsome learning'*,MPRA paper No. 7708, Bangladeshi, March.

Jellouli, S 2009, '*Bank specific, business and institutional environment determinants of nonperforming loans: Evidence from Middle East and North African countries*', *economic research forum*, Cairo, Egypt

Jiminez, G & Saurina, J 2006'*Credit cycles, credit risk and prudential regulation',*International Journal of Central Banking, Vol.2, No.2, PP. 65-98.

Jusoff, K, Ahemed, W, Muhamad, S & Asari, H 2011, 'Analysis of Non-performing loans, interest rate, inflation rate', *world applied science journal*, Vol.12, PP.41-48

Keeton, W. and. Morris, C1987. '*Why Do Banks' Loan Losses Differ*?' Federal Reserve Bankof Kansas City, Economic Review, May, pp. 3–21.

Keovongvichith, P.2012, '*An Analysis of the Recent Financial Performance of the Laotian Banking Sector*' during 2005-2010, *International Journal of Economics and Finance,* 4 (4), pp.1

Kipyego ,D& Moses ,W ,2013: *Effects of Credit Information Sharing on Nonperforming Loans.* European Scientific Journal, Vol.9, No.13 ISSN: 1857 – 7881

Klein, N. 2013,'*Nonperforming loan in CESEE: Determinants and Impact on Macroeconomic Performance'*IMF working Papers 13(72)

Kothari. 2004,'*Research Methodology: Methods & Techniques.* 2nd edition. New Delhi, India: New age International Publishers.

Louzis,D.P.,Vouldis, A. & Metaxes, V.L. 2012."*Macroeconomic and bank-specific determinants of nonperforming loans in Greece" A comparative study of mortgage, business and consumer loan portfolios',* Journal of Banking & Finance, Vol. 36, No. 4, pp. 1012-1027.

Mac Donald, S.S. and Koch, T.W 2006,'*Management of Banking*', 6 th edition, U.S.A:Thomson - South Western.

Makri, V., Tsagkanos, A., & Bellas A 2014. '*Determinants of Non-Performing Loans: The Case of Euro zone. Panoeconomicus', 61*(2), 193-206. https://doi.org/10.2298/PAN1402193M

McCarthy, M.G, Schneider, D.K. & Tibb, S.L. 2010, '*Investments and loans reported by the10 largest U.S banks'*, Journal of Bank accounting and FinanceDec 2009- Jan 2010: P19-24.

Mehari, M 2012, „credit risk management in Ethiopia banking industry", MBA thesis, Addis Ababa University

Mendes,V.& Abree, M. 2003,'*Do Macro-Financial Variables Matter for European Bank Interest Margins and Profitability?.'InEcoMod2003-International Conference on Policy Modeling*. Global Economic Modeling Network.

Meshesha,G. 2015, Determinants of Non-Performing Loans: *The Case of the EthiopianCommercial Banks. Addis Ababa university.*

Monaich. w (2013), The case of nonperforming loans in commercial banks in Kenya

NBE, 2008, Asset classification and Provisioning for development financial institution Directive No. SBB/43/2008.National Bank of Ethiopia, Addis Ababa Ethiopia .

NBE, 2012, Asset classification and Provisioning for development financial institution Directive No. SBB/52/2012.National Bank of Ethiopia, Addis Ababa Ethiopia .

Negera, W. 2012, Determinants of Non-Performing Loans The case of Ethiopian Banks, research report, University of South Africa

Nkusu,W. 2011, „Nonperforming Loans and Macro financial Vulnerabilities in Advanced Economies" *International Monetary Fund*, Vol.11, No.161

Pasha,S and Khemraj, T 2009," The determinants of non-performing loans: an econometric case study of Guyana", The Guyana Bank(Unpublished)

Patersson, J & Isac,W. 2004 . Non- Performing Loans-The markets of Italy and Sweden, Uppsala University thesis, Department of Business Studies.

Petra T., 2007. *Panel data: fixed effects random effects dynamic panel data models*, New York, Cambridge University Press.

Prakash, R. & Poudel, S 2013. Macroeconomic Determinants of Credit Risk in Nepalese Banking Industry. Proceedings of 21st International Business Research Conference. Toronto: Ryerson University.

Raja, A and Sami, B.N. 2015 "Determinants of Bank Interest Margins in the Caucasus and Central Asia", IMF, working paper/15/87

Rahman, A, Asaduz,z.& Shakhaowat ,H. 2017, *Impact of Financial Ratios on Non-Performing Loans of Publicly Traded Commercial Banks in Bangladesh* ,Vol. 8, No. 1; 2017

Richard, C 2011 "Current Issue in Financial Economics: An overview," Atlantic Economic Journal, Vol. 39(1), pages 59-70, March

Rime, B. 2001, "Capital requirements and bank behavior: empirical evidence for Switzerland", Journal of Banking & Finance, Vol. 25 No. 5, pp. 789-805.

Rose PS. 2002: *Commercial Bank Management*, 5 th edition. New York: McGraw-Hill/Irwin.

Saba, I., Kouser ,R. and Azeem 'M. 2012: *Determinants of nonperforming Loans: Case of US Banking Sector.* International Journal of Banking and Finance; No. 44 Pp 479-88

Salas, V and Saurina, J2002, „Credit risk in two institutional regimes: Spanish Commercial and Savings banks", *Journal of Financial Services Research*, Vol. 22, No 3, PP. 203-224.

Selma M.A. and Jouini F., 2013. Macro and Micro determinants of Nonperforming loans in Tunisia*, International Journal of Economics and Financial Issues* 13 (3), pp. 852-860.

Skarica, B 2013, *Determinants of Non-Performing Loans in Central And Eastern European* Countries: Financial Theory and Practice. 38 (1) 37-59

Schindler P.S and Cooper D.R., 2003. Business Research Methods. 8th ed. McGraw-Hill: New York.

Shelagh, H, 2005*Modern Banking*, Wiley, ISBN: 978-0-470-09500-3.

Shingjerji A 2013 *Impact of Bank Specific Variables on the Nonperforming loans ratio in Albanian Banking System, Journal of Finance and Accounting*: Vol.4, No.7.

Shinaj V and Mansur M 2015, Does *the conventional benchmark prop up non-performing loans in Islamic banks?* A case study of Malaysia with ARDL Approach

Sinkey.J.F., & Greenwalt,M.1991'Loan-loss experience and risk-taking behavior at large commercial banks. *Journal of Financial Services Research, 5*(2), 43-59. https://doi.org/10.1007/BF00127083

Sufian, F & Habibullah, M.S., 2010. Does economic freedom fosters banks' performance? Panel evidence from Malaysia. Journal of Contemporary Accounting & Economics 6,77-91.

Swamy, V 2012 "*Impact of Macroeconomic and Endogenous Factors on Nonperforming Bank Assets"* International Journal of Banking and Finance, Vol. 9.

Tomak, S.2013, Determinants of Commercial Banks 'lending Behavior: Evidence fromTurkey:Journalof Empirical Research, 3(8):933-943.

Tsige Z ,2013 "Determinants of Non-performing Loans: Empirical Study on Ethiopian Commercial." Addis Ababa University, 2013.

Uppal,R.K 2009, sector advances: Trends, issues and strategies. *Journal of Accounting and Taxation*, *1*(5),79-89.

Vogiazas, Mc, Schneider, D.K. and Tibb, S.L. 2010, Investments and loans reported by the10 largest U.S banks, *Journal of Bank*

Vogiazas, D & Nikolaidou, E 2011, "Credit risk determinants in the Bulgarian", *Vogiazas-Nikolaidou,* PP. 177-189

Walter, John R. "Loan loss reserve." *Economic Review*, Julay 1991: 22-27.

Waweru, N & Kalani, V.M. 2009, Commercial banking crises in Kenya: Causes an remedies.*African Journal of Accounting, Economics, Finance and Banking Research*, *4*(4), 12-33

Wei-Shong,A Lin ,P, Mei Albert, K 2006, The internal performance measures ofbank lending: a value-added approach, Benchmarking: An International Journal, 13(3).272-28: An International Journal, 13(3).272-289

Appendices

Appendix –I: Tests for the Heteroskedasticity Test: ARCH

Heteroskedasticity Test: ARCH

F-statistic	0.203311	Prob. F(1,89)	0.6532
Obs*R-squared	0.207406	Prob. Chi-Square(1)	0.6488

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 05/14/17 Time: 11:36
Sample (adjusted): 2 99
Included observations: 91 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.123758	1.562852	2.638610	0.0098
RESID^2(-1)	0.047743	0.105883	0.450900	0.6532

R-squared	0.002279	Mean dependent var	4.338685
Adjusted R-squared	-0.008931	S.D. dependent var	14.13534
S.E. of regression	14.19832	Akaike info criterion	8.165858
Sum squared resid	17941.72	Schwarz criterion	8.221042
Log likelihood	-369.5465	Hannan-Quinn criter.	8.188121
F-statistic	0.203311	Durbin-Watson stat	2.032236
Prob(F-statistic)	0.653158		

Appendix –II: Tests for the autocorrelation: Breusch-Godfrey

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.514146	Prob. F(2,84)	0.0870
Obs*R-squared	5.309093	Prob. Chi-Square(2)	0.0703

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 05/14/17 Time: 11:35
Sample: 1 99
Included observations: 96
Presample and interior missing value lagged residuals set to zero.

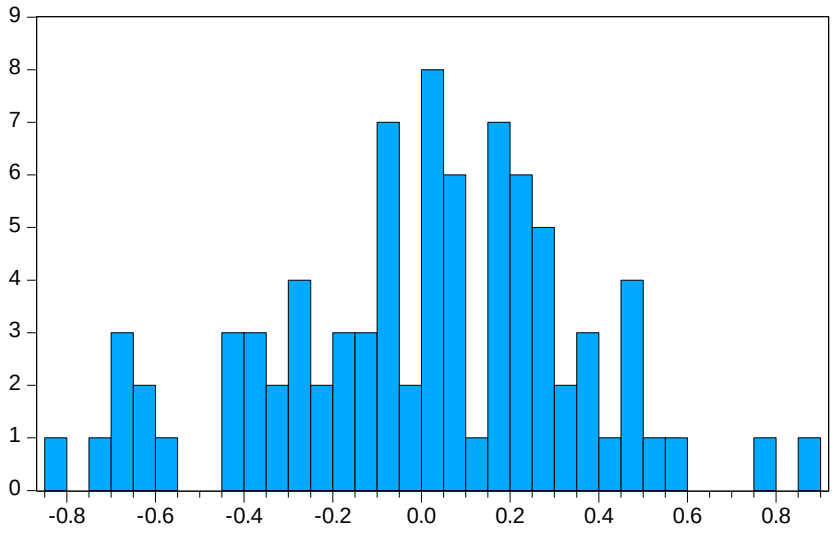
Variable	Coefficient	Std. Error	t-Statistic	Prob.
NIM	0.011097	0.103078	0.107655	0.9145
LTD	0.003002	0.018790	0.159743	0.8735
LLP	0.005479	0.081547	0.067187	0.9466
CAR	0.000855	0.054043	0.015828	0.9874
ROE	0.002921	0.021403	0.136461	0.8918
GDP	-0.091849	0.234166	-0.392238	0.6959
UM	-0.008742	0.056137	-0.155729	0.8766
C	0.738050	2.621969	0.281487	0.7790
RESID(-1)	0.248516	0.111732	2.224217	0.0288
RESID(-2)	-0.082681	0.110415	-0.748818	0.4561

R-squared	0.056480	Mean dependent var	2.82E-17
Adjusted R-squared	-0.044612	S.D. dependent var	2.104097
S.E. of regression	2.150518	Akaike info criterion	4.469583
Sum squared resid	388.4773	Schwarz criterion	4.740146
Log likelihood	-200.0704	Hannan-Quinn criter.	4.578871
F-statistic	0.558699	Durbin-Watson stat	1.985207
Prob(F-statistic)	0.826934		

Appendix –III: Tests for multicollinearity: correlation matrix

	NIM	LTD	LLP	CAR	ROE	GDP	UM
NIM	1.000000	0.180393	-0.253886	0.079272	-0.273247	-0.181950	-0.044697
LTD	0.180393	1.000000	-0.212783	0.546052	-0.384766	0.267052	0.048522
LLP	-0.253886	-0.212783	1.000000	-0.234172	0.147464	0.253107	0.067637
CAR	0.079272	0.546052	-0.234172	1.000000	-0.595179	0.062215	0.013172
ROE	-0.273247	-0.384766	0.147464	-0.595179	1.000000	0.082486	-0.099317
GDP	-0.181950	0.267052	0.253107	0.062215	0.082486	1.000000	0.096968
UM	-0.044697	0.048522	0.067637	0.013172	-0.099317	0.096968	1.000000

Appendix –IV: Tests for Normality: Jarque- Bera test



Series: Standardized Residuals
Sample 2006 2016
Observations 96

Mean	1.32e-17
Median	0.031829
Maximum	0.855234
Minimum	-0.824899
Std. Dev.	0.347351
Skewness	-0.238464
Kurtosis	2.882431
Jarque-Bera	0.844491
Probability	0.655573

Appendix – V: Tests for Model Specification: Ramsey Reset Tests

Ramsey RESET Test
Equation: UNTITLED
Specification: NPL NIM LTD LLP CAR ROE GDP UM C
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	0.386257	85	0.7003
F-statistic	0.149195	(1, 85)	0.7003
Likelihood ratio	0.164847	1	0.6847

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.721419	1	0.721419
Restricted SSR	411.7317	86	4.787578
Unrestricted SSR	411.0103	85	4.835416

LR test summary:

	Value	df
Restricted LogL	-202.8029	86
Unrestricted LogL	-202.7204	85

Unrestricted Test Equation:
Dependent Variable: NPL
Method: Least Squares
Date: 05/14/17 Time: 11:37
Sample: 1 99
Included observations: 96

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NIM	-0.065904	0.104864	-0.628472	0.5314
LTD	0.045584	0.019642	2.320705	0.0227
LLP	0.788189	0.259381	3.038731	0.0032
CAR	-0.152906	0.056626	-2.700288	0.0084
ROE	-0.043199	0.022178	-1.947864	0.0547
GDP	0.245459	0.236558	1.037626	0.3024
UM	0.063265	0.057316	1.103795	0.2728
C	-1.407114	2.749707	-0.511732	0.6102
FITTED^2	0.006042	0.015642	0.386257	0.7003

R-squared	0.663526	Mean dependent var	4.476492
Adjusted R-squared	0.631858	S.D. dependent var	3.624175
S.E. of regression	2.198958	Akaike info criterion	4.504690
Sum squared resid	411.0103	Schwarz criterion	4.748197
Log likelihood	-202.7204	Hannan-Quinn criter.	4.603049
F-statistic	20.95248	Durbin-Watson stat	1.548761
Prob(F-statistic)	0.000000		

Appendix – VI: Tests for Model Selection (Random Effect versus Fixed Effect Models): Hausman specification test

Correlated Random Effects - Hausman Test
Equation: Untitled
Test period random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Period random	2.867535	5	0.7204

Period random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
NIM	-0.052616	-0.065676	0.000780	0.6401
LTD	0.018884	0.047285	0.000480	0.1951
LLP	0.800281	0.883077	0.003063	0.1347
CAR	-0.136643	-0.157864	0.000411	0.2949
ROE	-0.041029	-0.044720	0.000133	0.7486

Period random effects test equation:
Dependent Variable: NPL
Method: Panel Least Squares
Date: 05/14/17 Time: 11:34
Sample: 2006 2016
Periods included: 11
Cross-sections included: 9
Total panel (unbalanced) observations: 96

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.648037	2.348005	1.553675	0.1243
NIM	-0.052616	0.109885	-0.478834	0.6334
LTD	0.018884	0.029272	0.645132	0.5207
LLP	0.800281	0.100901	7.931327	0.0000
CAR	-0.136643	0.059453	-2.298338	0.0242
ROE	-0.041029	0.024938	-1.645247	0.1039
GDP	0.491104	0.710740	0.690976	0.4916
UM	0.037503	0.125806	0.298101	0.7664

Effects Specification			
Period fixed (dummy variables)			
R-squared	0.682863	Mean dependent var	4.476492
Adjusted R-squared	0.621875	S.D. dependent var	3.624175
S.E. of regression	2.228573	Akaike info criterion	4.594439
Sum squared resid	387.3898	Schwarz criterion	5.027340
Log likelihood	-199.9386	Hannan-Quinn criter.	4.769300
F-statistic	11.19670	Durbin-Watson stat	1.567258
Prob(F-statistic)	0.000000		

Appendix – VII: Descriptive Analysis of dependent and independent variables

	NPL	LTD	NIM	CAR	LLP	GDP	ROE	UM
Mean	4.489378	62.80124	5.081591	13.16478	3.505086	10.31875	27.32524	16.44271
Median	3.360000	59.40000	4.690000	12.17386	2.595168	10.40000	25.68294	17.10000
Maximum	22.45000	129.6000	13.00000	54.46429	21.46871	11.80000	77.70970	20.40000
Minimum	0.170000	30.00000	0.500000	4.200000	0.787402	8.000000	-20.20195	4.500000
Std. Dev.	3.601867	15.30111	2.385576	5.936848	3.017910	1.113866	15.00128	4.013208
Observations	96	96	96	96	96	96	96	96

Appendix – VIII: Regression Results

Dependent Variable: NPL
Method: Panel EGLS (Period random effects)
Date: 05/14/17 Time: 11:33
Sample: 2006 2016
Periods included: 11
Cross-sections included: 9
Total panel (unbalanced) observations: 96
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NIM	-0.065676	0.106275	-0.617980	0.5382
LTD	0.047285	0.019401	2.437296	0.0169
LLP	0.883077	0.084367	10.46713	0.0000
CAR	-0.157864	0.055894	-2.824343	0.0059
ROE	-0.044720	0.022119	-2.021767	0.0463
GDP	0.253075	0.238909	1.059293	0.2924
UM	0.064983	0.057913	1.122089	0.2649
C	-1.676830	2.695384	-0.622112	0.5355

Effects Specification	S.D.	Rho
Period random	0.000000	0.0000
Idiosyncratic random	2.228573	1.0000

Weighted Statistics

R-squared	0.662935	Mean dependent var	4.476492
Adjusted R-squared	0.635500	S.D. dependent var	3.624175
S.E. of regression	2.188054	Sum squared resid	411.7317
F-statistic	24.16342	Durbin-Watson stat	1.596299
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.662935	Mean dependent var	4.476492
Sum squared resid	411.7317	Durbin-Watson stat	1.596299