Determinants of Non-performing Loans in Ethiopian Commercial Banks

By:

Sitina Amino

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Department of Accounting and Finance

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STATEMENT OF DECLARATION

I, Sitina Amino Hulala declare that the research work entitled "Determinants of Non-performing Loans in Ethiopian Commercial Banks" is my own work, except where otherwise indicated and acknowledged. It is submitted for the partial fulfillment of the requirement for the degree of Master of Science in Accounting and Finance in Addis Ababa University. This thesis has not, either in whole or in part, been submitted for a degree or diploma in this or any other universities.

Name: **Sitina Amino**

Signature: _____

Date: June, 2018

Addis Ababa University

School of Graduate Studies

This is to certify that the thesis prepared by Sitina Amino, entitled: *Determinants of Non-performing loans in Ethiopian commercial Banks* and 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.

Signed by the Examining Committee:

Internal Examiner:- **Abebe Yitayew (PhD)** Signature _____Date_____

External Examiner:-**Zenegnaw Abiy (PhD)** Signature _____Date _____

Advisor:-**Sewale A. (PhD)** Signature_____Date _____

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Abstract

This study examines the bank-specific and macro-economic determinants of Non-performing loans (NPLs) of commercial banks in Ethiopia. Nine commercial banks have been the subject for the study ranging from 2007 to 2016. The bank's financial statement, National Bank of Ethiopia, central statistics agency and Ministry of finance and Economic Cooperation has been the main source for the study. The study employs an explanatory research design and a quantitative research approach moreover; a random effect model was used. The empirical results showed that trade openness positively and significantly affects non-performing loans, whereas, exchange rate, unemployment and loan growth affects NPLs negatively and significantly. Contrary to previous studies, the findings also showed an insignificant relationship of real lending rate, capital adequacy ratio and ownership structure with NPLs of Ethiopian commercial banks. The study suggests that, commercial banks should consider the macro economic factors before extending loans.

Keywords: Non-performing loans; Macroeconomic determinants; Bank specific determinants

List of Acronyms

CAR	Capital Adequacy Ratio
CBB	Construction and Business Bank
CBO	Cooperative Bank of Oromia
CLRM	Classical Linear Regression Model
DB	Dashen Bank
ECBs	Ethiopian Commercial Banks
MoFEC	Ministry of Finance and Economic Cooperation
NBE	National Bank of Ethiopia
NIB	Nib International Bank
NPL/s	Non-Performing Loan/s
OLS	Ordinary Least Square
REER	Real Effective Exchange Rate
RLR	Real Lending Rate
ROA	Return on Asset
ROE	Return on Equity
UNE	Unemployment
WB	Wegagen Bank

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CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Economic growth in any country is not possible without a sound financial sector (Rajaraman and Visishtha, 2002). Good performance of these financial institutions is the symbol of prosperity and economic growth in any country or region and poor performance of these institutions not only hamper the economic growth and structure of the particular region but also affects the whole world (Khan and Senhadji, 2001). Commercial banks in most of the world economies are dominant type of financial institution that provide installment, facilitates the internal and external trade and the movement of money and capital when compared to any other financial institution (G &B, 2003; S &S, 2014).

Business study notes 2016 citing (Stephenson & Britain) expressed Banks as the custodians and distributers of liquid capital, which is the life-blood of commercial and industrial activities and upon the prudence of their administration depend the economic well-being of the nation. Effective process of economic development and the health of the economy are closely related to the soundness of banking system. Hence, the countries that possess an advanced banking system grew faster than those whose banking system was weak (Levine, 1997).

Survival and soundness of the banking enterprise is exposed to different risks such as market risk, liquidity risk, operational risk and credit risk. The greatest risk of all is credit risk (Dang, 2011). Credit risks are losses from the refusal or inability of credit customers to pay what is owed in full and on time (Coyle, 2000). It is by far the most significant risk faced by banks and the success of their business depends on accurate measurement and efficient management of this risk to a greater extent than any other risks (Gieseche, 2004).The lending function is considered by the banking industry as one of the most important function for the utilization of funds. Since, banks earn their highest gross profits from loans; the administration of loan portfolios seriously affects the profitability of banks.In the process of providing credit assistance to the investment activities and

projects in the economy, financial institutions face inherent risks in the form of default risk which results in build-up of Non-Performing Loans (NPLs) that have a negative effect on the profitability of the financial institutions.

There is no standard form to define non-performing loans globally. Variation may exist in terms of the classification system, the scope, and contents as per country. (Seema B 2014). According to the International Monetary Fund (IMF, 2009), a non- performing 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 .

Under the Ethiopian banking business directive, non-performing loans are defined as "Loans or Advances whose credit quality has deteriorated such that full collection of principal and/or interest in accordance with the contractual repayment terms of the loan or advances in question" National Bank of Ethiopia (NBE, 2008).

The success of individual banks in credit risk management is largely reflected in the proportion of NPL's loans to gross lending (Flamini, 2009).Non-performing loans are one of the main reasons that cause insolvency of the financial institutions and ultimately hurt the whole economy (Hou, 2007). Each non-performing loan in the financial sector is viewed as an obverse mirror image of an ailing unprofitable enterprise.From this point of view, the eradication of non-performing loans is a necessary condition to improve the economic status of the financial institution. Continuously rolling over nonperforming loans locks up resources that could otherwise be invested to profitable sectors of the economy. Intuitively this hinders economic growth and impairs economic efficiency (Chikoko et al, 2012). In order to control the non-performing loans it is necessary to understand the root causesof these non-performing loans in the particular financial sector.

The causes for loan default vary in different countries and have a multidimensional aspect both, in developing and developed nations. Theoretically there are so many reasons as to why loans fail to perform. Some of these include depressed economic conditions, high real interest rate, inflation, lenient terms of credit, credit orientation, high credit growth and risk appetite, and poor monitoring. NPLs can arise from factors specific to the bank or macroeconomic conditions (Emmanuel, 2014).

Considering these facts, this research triesto find out the determinants of non-performing loans in Ethiopian commercial banks by including both bank specific and macro-economic variables.

1.2 Background of the Study Area

The history of modern banking in Ethiopia dates back to 1905. February 15, 1906 marked the beginning of banking in Ethiopia history when the first Bank of Abyssinia was inaugurated by Emperor Menelik II. According to the agreement, the bank was allowed to engage in commercial banking (Selling shares, accepting deposit and effecting payment in cheques) and to issue currency notes. The Bank, which started operation a year after its establishment agreement was signed, opened branches in Harar, Dire Dawa, Gore and Dembi- Dolo as well as an agency office in Gambelaand a transit office in Djibouti and It was a private bank whose shares were sold in Addis Ababa, New York, Paris, London, and Vienna (NBE, 2010).In 1908 a new development bank (named SocieteNationaled'Ethiope Pour le Development de l' Agriculture et du Commerce) and two other foreign banks (Banque de l'Indochine and the Compagnie de l' AfriqueOreintale) were also established Pankhrust (1968) cited in Alemayehu (2006). These banks were criticized for being wholly foreign owned. In 1931 the Ethiopian government purchased the Abysinian Bank, which was the dominant bank, and renamed it the _Bank of Ethiopia' – the first nationally owned bank on African continent Belay, (1990) ; Befekadu, (1995).The Bank of Ethiopia operated until 1935 and ceased to function because of the Italian invasion. During the five years of the Italian occupation (1936-41), many branches of the Italian Banks such as Bancod'italia, Banco de-Roma, Banco Di-Napoli and BancoNazianali del lavoro were operational in the main towns of Ethiopia. After evacuation of Italians, the State Bank of Ethiopia was established on November 30, 1943 with a capital of one million Maria Theresa dollars. It was serving both the commercial bank and central bank activities. Later on it is further dissolved into the National Bank of Ethiopia and Commercial Bank of Ethiopia Share Company.

As per NBE (2010), due to change of government in 1974, and the command economic system which had prevailed in the country, the Commercial Bank of Ethiopia S.C. and other banks and financial institutions were nationalized on January 1st, 1975. Accordingly, the three private owned banks, Addis Ababa Bank, Banco di Roma and Banco di Napoli Merged in 1976 to form the second largest Bank in Ethiopia called Addis Bank. Then Addis Bank and Commercial Bank of Ethiopia S.C were merged by proclamation No.184 of August 2, 1980 to form the sole commercial bank in the country till the establishment of private commercial banks in 1994. The

nationalized banks were re-organized and one commercial bank, the Commercial Bank of Ethiopia; two specialized banks- the Agricultural and Industrial Bank (AIB), renamed as the Development Bank of Ethiopia (DBE) and a Housing and Savings Bank (HSB) and one insurance company, the Ethiopian Insurance Corporation (EIC) were formed. During the era of state socialism (1974-1991), Ethiopia's financial institutions were charged with executing the national economic plan; state enterprises received bank finance in accordance with the plan's priorities. This system based on the template of the Soviet Union, saw little need to develop the tools and techniques of financial systems (NBE, 2008).

With the overthrow of the Derg Regime in 1991, Ethiopia began its transition to a market economy. This transition has had profound implications for financial system. New financial system has been expanded, and the role of central bank is being formulated. During the socialist period, the government nationalized the small commercial banks and concentrated them into the Commercial Bank of Ethiopia (CBE). Commercial Bank of Ethiopia (CBE) and the other government banks were obliged to lend to public enterprises according to government instructions, which were in turn based on central planning.

Proclamation No. 83/1994 which had allowed the establishment of private banks has marked the beginning of new era in the Ethiopian banking sector development. Commercial Banks both public and private are currently operational in line with Banking Proclamation No. 592/2008. After the enactment of the legislation the number of commercial banks in the country grows and reached eighteen. Currently, with the merge of Construction and Business Bank (CBB) with Commercial Bank of Ethiopia (CBE) in January 2016 the number of banks is minimized to seventeen with the composition of one public owned and sixteen private owned.

1.3 Statement of the problem

One of the main functions of commercial banks is channeling funds from people who have surplus funds to people who have deficit fund by accepting deposit and granting loans and advances.Loans are forming a greater portion of the total assets in banks. These assets generate huge interest income for banks, which is to a large extent determines the financial performance of banks.But granting loan isthe most risky service because of the credit risk, which is directly related to non-performing loans. Non-performing loans reduce the banks' earning capacity, leading to bank distress and financial crises that shrink the levels of domestic investment, put

pressure on government revenue to bail the failed banks, and ultimately hinder the intermediation role of banks.According to Brownbridge, (1998) many empirical researches have shown that most of the time banking failures or banking crisis are caused by non-performing loans.NPLs have been also identified as the major threat to the profitability of banks (Aremu, Suberu&Oke, 2010; Sinkey, 1992).

Despite the heavy regulation and ongoing efforts made to control the banking industry in general and the lending activities in particular, the NPLs problems are still a worldwide headache and a major concern for both international and local regulators (Boudriga 2009).In Ethiopia, the banking environment has undergone many regulatory and financial reforms like other African countries with the aim of improving profitability, efficiency and productivity (Lelissa 2007).Despite these changes, the banking industry in Ethiopia is characterized by operational inefficient, little and insufficient competition and perhaps can be distinguished by its market concentration towards the big government owned commercial bank, poor credit risk management practices and eventually less contribution to the GDP as compared to the developed world financial institutions (Abera 2012, Tefera 2011 and Tilahun 2010). Operational inefficiency and poor credit risk management are usually associated with sizeable volume of NPLs (Berger and Humphrey 1992). In this regard, to control the adverse impact of increasing non-performing loans in Ethiopian banking sector, the National Bank of Ethiopia has issued a directive which strictly requires all banks to maintain ratio of their non -performing assets below five percent in 2008.

Following the 2008 NBE declaration, NPLs of ECBs have shown a significant improvement and lowered to an average of 5 % (NBE 2011). However, there is a significant variation on the reduction of NPLs from banks to bank. In some bank the change is abrupt and surprise while in the others the change is steady and constant.

Each non-performing loan in the financial sector is viewed as an obverse mirror image of an ailing unprofitable enterprise. Virtually all research on the causes of bank and thrift failures find that failing institutions have large proportions of non-performing loans prior to failure and those non-performing loans are a statistically significant predictor of insolvency (Berger &DeYoung, 1997). From this point of view, the eradication of non-performing loans is a necessary condition to improve the economic status of the financial institution. First and most effective step to treatment of this chronic and epidemic pain is pathology and then finding of effective solutions

for modifying and improving of banks conditions as the country's greatest economic patient. Pathology of causes and factors that will raise NPLs amount and provision of practical solutions can reduce the damaging effect of NPLs on banks (Sinkey, 2002:90 sited in Biabani et al., 2012).

Many studies have examined the causes of non-performing loans in several countries around the world; however, little research has gone to the study of the causes of NPLs in Africa (Onsarigo, et al., 2013). Like most Africa countries, in Ethiopia, to the knowledge of the researcher, there has not been much research which is conducted on determinants of loan defaults except for the study of Daniel (2010), Geletta (2012),Tesfaye(2015), Habtamu (2015), Anisa (2015) and Mesay (2017). The related studies conducted by Daniel (2010), Geletta (2012),Tesfaye(2015) and Habtamu (2015) assessed the determinants of NPLs in Ethiopian commercial banks focusing on bank-specific variables. The study by Anisa (2015) and Mesay (2017) combined both the macroeconomic and bank specific factors but both the studies utilize the same macroeconomic variables. Accordingly, as per the knowledge of the researcher, the macroeconomic determinants of NPLs in Ethiopian banking sector are not addressed. Moreover, all the studies except for the study of Mesay (2017) use the data before the year 2013 so the current impact of the determinants on NPLs is not studied. Therefore, the existing knowledge gap along with the very danger of NPLs initiates this research.

1.4 Objectives of the study

1.4.1. General Objective

The general objective of this study is investigating the effect of bank specific and macro-economic factors on the non-performing loans of Ethiopian commercial banks.

1.4.2 Specific Objectives

The specific objectives of the study are;

- To examine the effect of loan growth (LG) on banks NPLs.
- To examine the effect of lending rate (LR) on banks NPLs.
- To examine the effect of capital adequacy ratio (CAR) on banks NPLs.
- To examine the effect of ownership structure (OWS) on banks NPLs.

- To examine the effect of trade openness (TOP) on banks NPLs.
- To examine the effect of exchange rate (EXR) on banks NPLs.
- To examine the effect of unemployment rate (UNE) on banks NPLs.

Research question (RQ)

In line with the general objective highlighted above, the following research question is formulated:

RQ: What are the determinants of banks' non-performing loans in Ethiopia's commercial banking sector?

1.5 Hypotheses of the Study

Reviewed empirical literatures showed that there is no agreement among international researches on the sign of coefficient of estimate of selected bank specific and macroeconomic independent variables. Thus, based on the existing theories and past empirical studies that have been conducted on the determinants of bank's NPLs the researcher has formulated the following seven hypotheses in line with the broad objective of the study.

HP1: Loan growth of a bank has positive and significant effect on bank's NPLs.

HP2: Capital adequacy ratio of a bank has significant effect on bank's NPLs.

HP3: State ownership of a bank has positive and significant effect on bank's NPLs.

HP4: Trade openness has positive and significant effect on bank's NPLs.

HP5: Real lending rate has positive and significant effect on bank's NPLs.

HP6: Exchange rate has significant effect on bank's NPLs.

HP7: Unemployment rate has significant effect on bank's NPLs.

1.6 Significance of the study

NPLs are one of the most important causes of the economic stagnation troubles. If the issue of non-performing loans is left unresolved, it can compound into financial crisis. Therefore,

minimization of NPL is a necessary condition for improving economic growth. The first step to overcome a problem is knowing the root cause. By identifying the main causes of NPLs in the banking sector, the finding of the research gives important suggestions for mangers and bank regulating authorities in dealing with NPLs management. Moreover, the study narrow the literature gap in Ethiopia banking system regarding the determinants of NPLs by utilizing both macroeconomic and bank specific variables. Finally, it will serve as a reference for further studies in the respective area.

1.7 Scope of the study

This study is limited to both bank specific and macroeconomic determinants of NPLs of Commercial banks in Ethiopia from the period 2007-2016.The study is limited to all commercial banks in Ethiopia that are registered by NBE and have at least ten years data namely commercial bank of Ethiopia, Awash international bank, Dashen bank, bank of Abyssinia, Wegagenbank,United bank, Nib International bank, Cooperative Bank of Oromia and Lion International Bank. These periods are selected so as to increase the cross section i.e. the number of banks and include senior banks which are expected to have more experience on the lending activity.

1.8 Limitation of the study

It's obvious that, incorporating all independent variables in a single econometrics model is impossible. And, that is why a disturbance term is usually incorporated in econometrics model (Brooks 2008). Hence, the study is limited to three bank specific variables (banks' loan growth, capital adequacy ratio and ownership structure) and fourmacroeconomic variables (trade openness, exchange rate, banks' lending rate and unemployment rate). More over the study relies on secondary data sources only.

CHAPTER TWO

REVIEW OF RELATED LITERATURES

2.1 Theoretical and Conceptual Review

2.1.1 Introduction

Credit lending remains the chief activity of the banking sector throughout the world. Banks can no longer survive without this activity. This is the reasonthat credit worth is considered as a key sign of financial health and soundness of financial institutions particularly the banks. The interests charged by the banks on advances and loans shape large part of the bank's assets(Saeed and Zahid, 2016).These assets constitute the primary source of income by banks. As a business institution, a bank aims at making a giant profit. Since loans and advances are more profitable than any other assets, it is willing to lend as much of its funds as possible. But banks have to be careful about the safety of such advances (RadhaandVasudevan, 1980).Despite the loan portfolio is typically the largest asset and the predominate source of revenue of banks, the function of granting credit is not free of risks (Casu et al. 2006). Risk takes many forms, each affecting the economic activity on a lesser or greater extent (Solomon &Muntean, 2012).In practice, loans are considered as the types of investment which have the highest levels of risks with regards to the difficulty of the funds' recovery. Commercial banks are exposed to numerous difficulties regarding the protection and recovery of funds granted in the form of loans and credit facilities. One of the main difficulty that the commercial banks are exposed to is the failure of borrowers to repay their obligations on time (Casu et al ,2006). As Heffernan (2005) noted 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.

2.1.2 Definition of Non-performing loans

There is no global standard to define non-performing loans at the practical level. Variations exist in terms of the classification system, the scope, and contents (Chikoko et al, 2012). The extent to which authorities have been involved in developing criteria to distinguish between "good" and "bad" loans differs substantially between countries. Some countries use quantitative criteria (e.g., number of days of overdue schedule payments), while other countries exclusively rely on

qualitative norms (such as the availability of information about the client's financial status, and management judgment about future payments). Some countries (like German and U.K) do not give standard criteria at all. (IMF working paper, 2001)

Caprio and Klin-gebiel(1999) defined Non-performing loans as "loans which for a relatively long period of time do not generate income. This implies that the principal and or interest on these loans have been left unpaid for at least 90 days." Another definition was given byVanGreuning, &Bratavonic(2003) as "a non-performing loan is an advance by a financial institution that is not earning income and full payment of principal. As such interest is no longer anticipated." Moreover, Bloem and Freeman (2005) put a criteria for a loan to be called NPL as "a loan is NPL when payments of interest and/or principal are past due by 90 days or more, or interest payments equal to 90 days or more have been capitalized, refinanced, or delayed by agreement".

According to IMF a loan is non-performing when payments of interest and principal are past due by 90 days or more, or at least 90 days of interest payments have been capitalized, refinanced or delayed by agreement, or payments are less than 90 days overdue, but there are other good reasons to doubt that payments will be made in full" (International Monetary Fund, 2005).

On the basis of the repayment schedule, loan is categorized into the following:

i. Pass loan: Loan due till 3 months

ii. Sub-standard loan:Loan due from 3 to 6 months

iii. Doubtful loan: Loan due from 6 months to 1 year.

iv. Loss Loan: Loan due even after 1 year.

Pass loan is categorized as performing loan whereas all other like sub-standard, doubtful and loss loan are categorized as non-performing loan.

The Ethiopian banking business directivedefined non-performing loans 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 (NBE, 2008). It further states that loans or advances with pre-established repayment programs are non-performing when principal and/or interest is due and uncollected for Ninety consecutive days or

more beyond the scheduled payment date or maturity (NBE, 2008). The directive also classified Non-performing loans into four grades of risk: (i) special mention; (ii) sub-standard; (iii) doubtful; and (iv) loss.

i. Special mention

a) Loans or advance with pre-established repayment programs past due 30(thirty) days or more, but less than 90(ninety) days;

b) Overdrafts and loans or advances that do not have a pre-established repayment program, if:

I. The debt remains outstanding for 30 (thirty) consecutive days or more beyond the scheduled payment date or maturity, but less than 90 (ninety) days; or

II. The debt exceeds the borrower's approved limit for 30 (thirty) consecutive days or more, but less than 90 (ninety) days; or

III. Interest is due and uncollected for 30 (thirty) consecutive days or more; but less than 90 (ninety) days; or

IV. For overdrafts, the account has been inactive for 30 (thirty) consecutive days or more, but less than 90 (ninety) days or the account fails to show the One to four percent of the approved limit debit balance at least once over 360 days preceding the date of loan review.

ii. Substandard

a) Loans or advances with pre-established repayment programs past due 90 (ninety) days or more, but less than 180 (one-hundred-eighty) days:

b) Overdrafts and loans or advances that do not have a pre-established repayment, if:

I. The debt remains outstanding for 90 (ninety) consecutive days or more beyond the scheduled payment date or maturity, but less than 180 (one hundred eighty) days; or

II. The debt exceeds the borrower's approved limit for 90 (ninety) consecutive days or more, but less than 180 (one hundred eighty) days; or

III. Interest is due and uncollected for 90 (ninety) days or more, but less than 180 (one hundred eighty) days; or

IV. For overdrafts, the account has been inactive for 90 (ninety) consecutive days or more, but less than 180 (one hundred eighty) days; or the account fails to show Five to nineteen percent of the approved limit debit balance at least once over 360 days preceding the date of loan review.

In addition to the above NBE directive no SBB/43/2008 categorized the following non-performing loans and advances as substandard:

1) Renegotiated term loans unless equivalent of all past due interest is paid by the borrower in cash at the time of renegotiation and the following payments are made by the borrower on a consistent and timely basis in accordance with the restructured terms of the loan or advance:

a. In the case of term loans with monthly or quarterly installment repayments, at least 3 (three) consecutive repayments;

b. In the case of loans with semi-annual installment repayments, at least 2 (two) consecutive repayments;

c. In the case of loans with annual installment repayments, at least one repayment;

2) Renegotiated non-performing overdraft facilities unless equivalent of all past due interest is paid by the borrower in cash at the time of renegotiation and the account shows at a minimum a nil balance at least once or a turnover rate of once the approved limit.

3) Renegotiated non-performing merchandize loans unless physical inventory of the merchandize taken by the bank at the time of renegotiation shows that the outstanding principal loan and interest thereof are fully covered and the safety margin determined following the inventory is at least not lower than the margin stated in the loan contract entered into by the bank and the borrower at the time of initial extension of the loan.

iii. Doubtful

a) Loans or advances with pre-established repayment programs: past due 180 (one hundred eighty) days or more, but less than 360 (three hundred sixty) days;

b) Overdrafts and loans or advances that do not have a pre-established repayment program, if:

I. The debt remains outstanding for 180 (one hundred eighty) consecutive days or more beyond the scheduled payment date or maturity, but less than 360 (three hundred sixty) days; or

II. The debt exceeds the borrower's approved limit for 180 (one hundred eighty) consecutive days or more, but less than 360 (three hundred sixty) days; or

III. Interest is due and uncollected for 180 (one hundred eighty) consecutive days or more, but less than 360 (three hundred sixty) days; or

IV. For overdrafts, the account has been inactive for 180 (one hundred eighty) consecutive days or more, but less than 360 (three hundred sixty) days: or the account fails to show Twenty to forty nine percent of the approved limit at least once over 360 days preceding the date of loan review

iv. Loss

a) Non-performing loans or advances with pre-established repayment programs past due to 360 (three hundred sixty) days or more;

b) Over drafts and loans or advances that do not have a pre-established repayment program, if:

I. The debt remains outstanding for 360 (three hundred sixty) consecutive days or more beyond the scheduled payment date or maturity; or

II. The debt exceeds the borrower's approved limit for 360 (three hundred sixty) days or more; or

III. Interest due and uncollected for 360 (three hundred sixty) days or more; or

IV. For overdrafts, the account has been inactive for 360 (three hundred sixty) consecutive days or more, or the account fails to show Fifty percent and above of the approved limit at least once over 360 days preceding the date of loan review.

2.1.3 Non-performing Loans Provisioning

National bank of Ethiopia directive requires all banks to maintain a provisions for Loan Losses account which shall be created by charges to provision expense in the income statement and shall be maintained at a level adequate to absorb potential losses in the loans or advances portfolio. In

determining the adequacy of the provisions for Loan Losses Account, provisions may be attributed to individual loans or advances or groupsof loans or advances. The provisions for Loan Losses Account always have a credit balance. Additions to or reductions of the provisions for Loan Losses Account should be made only through charges to provisions in the income statement at least every calendar quarter.

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

Table 1: Non-performing Loans Provisioning Percentage

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

Source: NBE Directive no SBB/43/2008

2.1.4 The impact of NPL on the Operation of Commercial Banks

1. NPL reduces profitability

NPLs rate is the most important issue that has negative effect on bank profitability and inability to survive. This is true because NPLs have serious negative impact on loan growth rate; in which case, there will be a negative effect on banks profitability as it reduces loan amount and interest income of the banks simultaneously (Ugoani, 2016). In line with National bank of Ethiopia regulations, the lending institution has to make provision and charges for credit losses (bad debt/impairment) which ultimately reduce the profit level. Beside this delay or failure of repayment of loanprincipal and interest on time and in full, negatively affects the profitability of the banks by reducing the interest income generated from granting more credit.

2. NPL hurts the bank's reputation

Reputation is everything in the banking business. A lowered reputation will steer away big customers and forces them to look for other banks. This will surely result in lower deposit and consequently, lower lending. (Onchomba, 2014)

3. NPL can cause insolvency

Banks kept only some money deposits as a reserve; the rest is lent out. If the lowered reputation due to NPLs results in withdrawal of deposits of big customers, the bank will effectively be insolvent.

2.1.5 Theories underpinning non-performing loans

Three theories underpinningnon-performing loans have been explained byWarue(2013) as follow;

1. **Deflation theory**

(Fisher,1933), which suggests that when the debt bubble bursts the following sequence of events occurs; debt liquidation leading to distress selling and contraction of deposit currency, as bank loans are paid off. Thiscontraction of deposits cause a fall in the level of prices, which leads to greater fall in the net worth of business, hence precipitating bankruptcies which leads the concerns running at a loss to make a reduction in output, in trade and in employment of labor. These cycles cause complicated disturbances in the rates of interest and a fall in the money value. The complicated disturbances described above can be summed as both external and internal forces (macro and micro factors) influencing state of over-indebtedness existing between, debtors or creditors or both which can compound to loan defaults.

2. **Financial theory**

Pioneered by Minsky (1974), also known as financial instability hypothesis, and attempted to provide an understanding and explanation of the characteristics of financial crisis. The theory suggests that, in prosperous times, when corporate cash flow rises beyond what is needed to pay off debt, a speculative euphoria develops, and soon thereafter debts exceed what borrowers can pay off from their incoming revenues, which in turn produces a financial crisis. As a result of such speculative borrowing bubbles, banks and lenders tighten credit availability, even to companies that can afford loans and the economy subsequently contracts.

The theory identifies three types of borrowers that contribute to the accumulation of insolvent debt: The "hedge borrower" can make debt payments (covering interest and principal) from

current cash flows from investments. For the "speculative borrower", the cash flow from investments can service the debt, i.e., cover the interest due, but the borrower must regularly roll over, or re-borrow, the principal. The "Ponzi borrower" borrows based on the belief that the appreciation of the value of the asset will be sufficient to refinance the debt but cannot make sufficient payments on interest or principal with the cash flow from investments; only the appreciating asset value can keep the Ponzi borrower afloat. Financial theory underpin this study in that, a hedge borrower would have a normal loan and is paying back both the principal and interest; the speculative borrower would have a watch loan; meaning loans' principal or interest is due and unpaid for 30 to 90 or have been refinanced, or rolled-over into a new loan; and the Ponzi borrower would have a substandard loan, meaning the payments do not cover the interest amount and the principal is actually increasing. The primary sources of repayment are not sufficient to service the loan. The loan is past due for more than 90 days but less than 180 days. Watch loans and substandard loans are nonperforming loans, hence applicability of financial theory in this study.

3. **Ownership structure theory**

Pioneered by Jensen (1976) integrated the elements of theory of property rights (Ronald, 1937), the theory of agency (Ross,1973) and Mitnick, 1974) and the theory of finance (Minsky, 1974). The theory explains why highly regulated industries such as public utilities or banks have higher debt-equity ratios for equivalent levels of risk than the average non-regulated firm. Jensen (1976) argues that, "ownership structure" rather than "capital structure" is the crucial variables to be determined, not just the relative amounts of debt and equity but also the fraction of the equity held by the manager.

On the other handMuriithi (2013)discussed four theories of nonperforming loans namely asymmetry theory, agency theory, transaction cost theory and stakeholder theory.

1. Asymmetry Theory

The theory explains that in the market, the party that possesses more information on a specific item to be transacted is in a position to negotiate optimal term for the transaction than the other party (Auronen, 2003).The party that knows less about the same specific item to be transacted is therefore in a position of making either right or wrong decision concerning the transaction. It may be difficult to distinguish good from bad borrowers (Richard, 2011).This may result into adverse

selection and moral hazards problems. Adverse selection and moral hazards have led to significant accumulation of Non-Performing loan in banks (Bester, 1994).

2. Agency Theory

According to the Agency theory, the principal agency problem can be reduced by better monitoring such as establishing more appropriate incentives for managers. In the field of corporate risk management agency issue have been shown to influence managerial attitudes towards risk taking and hedging Smith and Stulz(1985). Theory also explains a possible mismatch of interest between shareholder management and debt holders due to asymmetries in earning distribution, which can result in the firm taking too much risk or not engaging in positive net value project (Smith and Stulz, 1987). Consequently, agency theory implies that defined hedging policies can have important influence on firm value (Fite and Pfleiderer, 1995).

3. Transaction Cost Theory

In transaction cost theory, does not contradict the assumption of complete markets. It is based on convexities in transaction technologies. Here, the financial intermediaries act as coalitions of individual lenders or scale or scope in the transaction technology.

Transaction cost theory has proven an essential framework for decision on the vertical boundaries of the firm. Transaction costs are the cost associated to the division of work. Williamson (2000), indicated that transaction occurs when a good or service is transferred across a technology separable interfaces. Variables that describe a transaction are among others, the specificity, the uncertainty, and the frequency of the transaction, whether an asset or a service is only or much more valuable in the context of a specific transaction. In the following human capital specificity the asset specificity and the site specificity are taken into account (Reddy, 2002).

4. Stakeholder theory

Stakeholders' theory, developed originally by Freeman(1984) as a managerial instrument, has since evolved into a theory of the firm with high explanatory potential. Stakeholder theory focuses explicitly on equilibrium of stakeholder's interests as the main determinant of corporate policy. The most promising contribution to risk management is the extension of implicit contracts theory form employment to other contracts, Including sales and financing Cornell and Shapiro, (1987). To certain industries, particularly high-tech and services, consumer trust in the company

being able to continue offering its services in the future can substantially contribute to company value. However, the value of these implicit claims is highly sensitive to expected costs of financial distress and bankruptcy. Since corporate risk management practices lead to a decrease in these expected costs, company value rises (Klimczak, 2005). Therefore stakeholder theory provides a new insight into possible rationale for risk management. However, it has not yet been tested directly. Investigations of financial distress hypothesis provide only indirect evidence (Judge, 2006)

2.1.6 Determinants of Non-performing loans

Though there is no particular theoretical framework that emphasizes on the determinants of NPLs many empirical studies have been done on the determinants of NPLs. The key causes of non-performing loans in the banking industry are threepronged. These are factors specific to internal organization, factors relating to the macro- economic policies, which ultimately determine how the economy works, and finally those factors relating to the actual management of business(Mucheke, 2001). As both of them are factors specific to the bank,many researches mergefactors relating to the actual management of business with factors specific to internal organization. The two concerns of the credit risk or the non-performing loans are (1) macroeconomic factors and (2) bank specific factors (Zurairah, 2010). Although there are researches which separately study the bank specific determinants and macroeconomic determinants alonemany studies combine the two set of factors together to study the determinants of NPLs.

2.1.6.1 Bank specific factors

Bank-specific variables refer to those factors which characterized individual banks. Those factors can be influenced by managerial decisions and usually associated with the specific policy choices of a particular bank with regard to its efforts to maximize efficiency and improve its risk management. The distinctive features of the banking sector and the policy choices of each particular bank with respect to their efforts for maximum efficiency and improvements in their risk management are expected to exert a decisive influence on the evolution of NPLs (Onchomba, 2014). Some of the bank specific determinants of NPLs are as follow;

\Loan growth

A rapid credit expansion is considered one of the most important causes of problem loans (Clair, 1992). Credit growth transmits information on general conditions in the credit market and reflects how easy it isto get access to credit and roll over earlier contracts, if necessary, in order to avoid default (Kattai, 2010).To maximize the short run benefits, managers seek to rapidly expand credit activities and may hence take inadequate credit exposures.Particularly, during periods of economic growth, the financial institutions engage in market share conquest campaigns discarding the necessary assessment of credit quality of borrowers (Fernandez De Lis et al., 2000). If so, the bank will be negatively affected by adverse selection. Higher levels of credit growth may increase the propensity for more defaults in the future because that increase might reflect that more risky loans are approved. This will contribute to an increasing rate of nonperforming loans in the future. Sinkey and Greenwalt (1991), Keeton (1999), Salas and Saurina (2002), Jimenez and Saurina (2006), Castro (2012) and Metaxas et al (2010) found out a direct (positive) association between Loan growth and the volume of NPLs.

Capital Adequacy Ratio

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. 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). Capital adequacy is a measure of the overall financial strength of a bank. The adequacy of capital is judged on the basis of the ratio of total capital equity to total assets (capital/asset).

It is widely accepted in literature that low capital adequacy ratio is associated with higher probability of loans default, because it induces the bank managers to involve in more risky projects. The confirmation of this statement was found in (Berger and DeYoung, 1997) USA banks analysis result of thinly capitalized banks take increased portfolio risk, which results in

higher levels of problem loans in the future, which supports moral hazard theory developed by them. However, Louzis et al. (2010) in his study examined the determinants of NPLs in the Greek financial sector using dynamic panel data model and found as capital adequacy ratio had insignificant effect on NPLs.According to Makri et al.(2014), there is negative relationship with NPLs indicating a risky loan portfolio is marked by a high NPL (equivalent to high credit risk). However, Djiogap and Ngomsi (2012) found positive association between NPLs and capital adequacy ratio.

Ahmad and Ariff (2007) in their multi-country study of bank credit risk determinants reported that in Japan, Malaysia, and Mexico, capital is significantly positively related to credit risk. They attribute the reason for their finding to the requirement from banks to increase their capital as a cushion to absorb potential losses that might arise from an increase in credit risk. On the other hand, the researchers report a significant negative relationship between bank credit risk and capital in Australia and India. This result shows that relationship between capital and bank credit risk is controversial and not uniform in each country.

Ownership structure

In an imperfect world with high transaction costs, ownership does matter to economic efficiency and making different ownership types is associated with different transaction costs (Cooter and Ulen 2000). In this regard, most existing literature suggested that state-owned banks are usually associated with high NPLs than privately owned banks. Salas and Saurina (2002) argue that to enhance the economic development of the country, state-owned banks have more incentives to fund riskier projects and to allocate more favorable credits for small and medium firms. Private institutions clearly have an incentive to solve adverse selection and moral hazard problems and lend to borrowers who have productive investment opportunities. Governments have less incentive to do so because they are not driven by the profit motive. The absence of a profit motive also means that state-owned banks are less likely to manage risk properly and be efficient (Hu 2004). This inadequate risk taking behavior (compared to the return profile) will lead to a higher level of NPLs.

2.1.6.2 Macroeconomic factors

The existing literature provides evidence that suggests a strong association between NPLs and macroeconomic factors. A great deal of studies like Salas and Saurina (2002), Jimenez and Saurina (2006), Jakubík (2007), Aver (2008), Bohachova (2008), Bonfim (2009), Kattai (2010) and Nkusu (2011), among others, concentrate their research basically on the impact of macroeconomic variables over the credit risk growth and stress that those variables should be included into the analysis since they have considerable influence on the changes of credit risk.

Trade openness

Trade openness is a degree of which countries or economies permit or have international trade with others. Higher trade openness can relate to higher bank lending but also makes a country more vulnerable to international shocks. Increasing trade openness in Sub-Saharan Africa exposes the banking system to adverse shocksMpofu&Nikolaidou (2018). As Mpofu&Nikolaidou (2018) has found out trade openness have positive and significant impact on NPLs.

Real Lending Rate

The real interest rate affects the debt burden i.e increasing interest rates will lead to a higher NPLs ratio (Gonzalez-Hermosillo (1997), Aver(2008), Louzis, Vouldis& Metaxas(2012), Nkusu(2011), Fofack(2005), Quagliariello(2007) and Castro(2013)).Asymmetric information and the resulting adverse selection problem can lead to "credit rationing," in which some borrowers are denied loans even when they are willing to pay a higher interest rate (Stiglitz and Weiss 1981). This occurs because as interest rates rise, prudent borrowers are more likely to decide that it would be unwise to borrow, whereas borrowers with the riskiest investment projects are often those who are willing to pay the highest interest rates. In this general setting, a higher interest rate leads to even greater adverse selection; that is, the higher interest rate increases the likelihood that the lender is lending to a bad credit risk and ultimately increases NPLs (Sinkey and Greenwalt (1991), Louziset al. (2010),Jimenez and Saurina (2006), Pasha and Khemraj (2009),Espinosa and Prasad (2010), Ahmad et al (2009) and Metaxas et al (2010)).

Exchange rate

One of the main determinants of economic instability is the exchange rate volatility (Zameer&Siddiqi, 2010). Its impact on NPL can be positive or negative (Nkusu 2011). Depreciation of the exchange rate can have mixed implications on borrowers' debt servicing capacity. On the one hand, it can improve the competitiveness of export-oriented firms. As long as the value of domestic currency depreciated (lower), export-oriented firms can dominate the international market at lower price (since their production cost is covered in domestic currency which has lower value than foreign currency and their revenue is collected in foreign currency which has higher value as compared to the domestic currency. Hence, depreciation of exchange rate can improve the debt-servicing capacity of export-oriented borrowers. On the other hand, it can adversely affect the debt-servicing capacity of borrowers who borrow in foreign currency (import-oriented firms). A negative correlation ofreal effective exchange rate and NPLs was founded by Castro (2013), Zribi&Boujelbene (2011), Gunsel (2012), Vogiazas&Nikolaidou (2011) and Fofack (2005).

Other studiessuch as: Kalirai&Scheicher (2002) and Aver (2008)have not identified any relationship between foreign exchange fluctuation and NLPs ratio.

Unemployment rate

Measures of unemployment appear to be a good predictor of problem loans in all countries (Gambera, 2000). Iuga and Lazea (2012) examined the influence of unemployment rate on non-performing loans in Romania during 2008- 2011. The results reveal that there is a strong correlation between unemployment rate and nonperforming loans.Nkusu (2011), Farhan et al. (2012), Selma and Jouini (2013), Akinlo and Emmanuel (2014),Vogiazes and Nikolaidu (2011), Bucur and Dragomirescu(2014) and Bofondi and Ropele (2011)also foundpositive and significant relationship between NPLs and unemployment. The reason behind the result is explained by the literatures as increase in unemployment negatively affects income of individuals thereby increasing their debt burden. In addition, increased unemployment in the economy negatively affected the demand for products of firms which ultimately affected the production/sales of the firms, which led to a decline in revenues of the firms and a fragile debt conditions.

Louzis, Vouldis& Metaxas (2012) explored the Greek banking industry in pre-crisis period and discovered that unemployment has a strong negative influence on credit risk. Also Valahzaghard et al (2012)analyze the unemployment rate influence on loan portfolio quality and their results indicate no significant relationship between unemployment rate and credit risk.

2.2 Empirical studies

Based on the empirical studies determinants of non-performing loans can be classified as macroeconomic factors and Bank specific factors. Though there are studies which separately study either the macroeconomic factors or bank specific factors alone, many studies combine the two set of factors together. Below are some studies on the determinants of NPLs;

2.2.1 Cross country studies

Ćurak, Pepur and Poposk (2013) investigates the determinants of non-performing loans in Southeastern European banking system using a sample of 69 banks in 10 countries (Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Macedonia, Moldavia, Montenegro, Romania, Serbia, and Slovenia) covering the period from 2003 to 2010. The study encompasses both macroeconomic and bank-specific factors. Using generalized Method of Moments estimator for dynamic panel models, the results show that lower economic growth, higher inflation and higher interest rate are associated with higher non-performing loans and the credit risk is affected by bank-specific variables such as bank size, performance (ROA) and solvency.

A study by Nkusu (2011) for twenty-six (26) advanced economies over the period 1998-2009 investigated the determinants of NPL ratio and of the first difference of the NPL ratio. The results showed that adverse macroeconomic development in particular a contraction of real GDP, a high unemployment rate, high interest rates, a fall in house prices and a fall in equity prices negatively affected NPLs.

Klein (2013) investigates the determinants and macroeconomic performance of NPLs in Central, Eastern, and South Eastern Europe (CESEE) for 1998 to 2011 period data for ten banks of each 16 countries. The study includes loan growth rate, inflation, unemployment rate and GDP growth rate as explanatory variables of the study. The study used fixed effect/ dynamic model and found positive relationship between inflation and NPLs. On the other hand, loan growth rate, GDP

growth rate have negative significant effect on the occurrences of NPLs. However, the study found as unemployment rate has no significant effect on NPLs.

Skarica (2013)studied the determinants of NPLs in Central and Eastern European countries. The studyemployed Fixed Effect Model and cover the period from 2007-2012 and seven Central and Eastern European countries were used. Utilizing loan growth, real GDP growth rate, market interest rate, Unemployment and inflation rate as determinants of NPLs, the study revealsthat GDP growth rate and unemployment rate has statistically significant negative association with NPLs while inflation has positive impact on NPLs.

A study by Castro (2012) entitled "Macroeconomic determinants of the credit risk in the banking system" for five countries (Greece, Ireland, Portugal, Spain and Italy) over the period 1997q1-2011q3employed dynamic panel data approaches and reveals that the banking credit risk is significantly affected by the macroeconomic environment.Specifically, the banking credit risk is negatively affected by the GDP growth and it is positively related with unemployment rate, interest rate, credit growthandappreciation of the real exchange rate.

Selma and Jouini (2013) conducted a study on Micro and Macro Determinants of Non-performing Loans for a sample of 85 banks in three countries (Italy, Greece and Spain) for the period of 2004-2008.After the application of the Fixed Effect model of panel data, by using both macroeconomic variables (the rate of growth of GDP, unemployment rate and real interest rate)and specific variables (return on assets, the change in loans and the loan loss reserves to total loans ratio) they found out a negative relationship of NPLs with the growth rate of GDP andROAand a positive association with the unemployment rate, the loan loss reserves to total loans and the real interest rate.

Bonilla (2011) investigated the determinants of non-performing loan indices in Spain and Italy within the period January 2004 to March 2012, using credit growth, wages, inflation, unemployment, and GDP as macroeconomic variables. The outcome of the study revealed that of the five macroeconomic variables, unemployment, wages, and GDP significantly affected non-performing loan indices in both countries.

2.2.2 Single country studies

Keeton and Morris (1987), investigated the causes of loan losses for a sample of nearly 2,500 US commercial banks for the period 1979–1985. Using simple linear regressions, they found out local economic conditions along with the poor performance of certain sectors like agriculture and energy explain the variation in loan losses recorded by the banks. The study also stated that commercial banks with greater risk desire tend to record higher losses.

Salas and Saurina (2002) analyze problem loans of the Spanish commercial andsavings banks and find that credit risk is determined by microeconomic individual bank level variables, such as bank size net interest margin, capital ratio and market power, in addition to real GDP growth.

Hu et al (2006) examined the relationship of ownership structure, size of banks and income diversification with NPLs of commercial banks in Taiwan with a panel dataset covering the period 1996-1999. The study shows that banks with higher government ownership recorded lower NPLs. Hu et al (2006) also show that bank size is negatively related to NPLs while diversification has not found a significant association with banks NPLs in Taiwan commercial banking sector.

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

Vogiazas and Nikolaidou (2011) investigated the credit risk determinants of the Bulgarian banking sector by means of time series modeling approach covering the time period from January 2001 to December 2010. The results indicate that, the macroeconomic and financial markets' variables, specifically the unemployment rate, the construction index, the industrial production index and the real effective exchange rate jointly with the credit growth and the global financial crisis influence the NPLs of Bulgarian banks.

Farhan et al. (2012) studied the economic determinants of Non-Performing Loans in 10 Pakistani banks by 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 six independent variablesonNPLs.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.

Louzis et al. (2012) identified factors that result in nonperforming loans in the banking sector of Greece by adopting a dynamic panel data method using both bank-specific and macroeconomic variables. The empirical research revealed that non-performing loans can be explained by macroeconomic variables, including GDP, interest rate, public debt, and unemployment, as well as the bank-specific variable of management quality.

JanvislooandMuhammad (2013), analyze relationship between Non-Performing Loans (NPL) and macroeconomic variables by using a dynamic panel data model in Malaysian commercial banking system for period 1997-2012. The results show that there is a strong evidence cyclical sensitivity of loan quality in Malaysia commercial banking system. Lending interest rate and foreign direct investment outflow are the most effective factors on NPL ratio with simultaneous positive effects and a reverse effect with one-year delay. The results also reveal that the impact of external shocks on the domestic banking system is more than internal shocks.

Bucur and Dragomirescu (2014) studied the influence of macroeconomic conditions on credit riskon the Romanian banking sector for the period 2008-2013. They revealed that the credit risk is significantly and negatively affected by the exchange rate fluctuation and significantly and positively affected by the unemployment rate.

A study by Rahman et al (2017) on the impact of financial ratios on non-performing loans of Bangladesh commercial banks 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 during 2010-2015. The study mostly agrees with the existing literature that, credit-deposit ratio, net interest margin have a positive influence on the non-performing loans and capital adequacy ratio, return on assets have a negative influence on the non-performing loans. It also reveals that, sensitive sector's loan, priority sector's loan have significant positive influence on the non-performing loans and unsecured loans, profit per employee, investment deposit ratio have significant negative impact on gross non-performing loan.

Warue (2013) investigated the effects of bank specific and macroeconomic factors on nonperforming loans in commercial banks of Kenya. Real GDP, GDP per capita, lending interest rates, inflation, government expenditure, export and imports and exchange rate are the variables included asmacroeconomic factors. Whereas, credit risk management techniques, bank structures, and quality management are factors included as bank specific factors. The period covered under this study was 1995 to 2009.Secondary and primary data of 44 commercial banks in Kenya was taken. And a causal- comparative research design based on bank structures was adopted. The study found evidence that per capita income was negative and significantly related to NPL levels across bank ownership categories Further, return on assets (ROA) was negative and significantly related to NPLs levels in large banks and small banks but insignificant in medium banks. In addition the study found that return on asset (ROA) was negative and significant in local banks and government banks but not in foreign banks. However the study found no evidence that banks asset size was related to NPLs levels across all bank categories in Kenya.

Akinlo and Emmanuel (2014), studied determinants of non-performing loans in Nigeria over the period 1981-2011. The study provides a macroeconomic model for non-performing loans and the analysis confirms that in the long run, economic growth is negatively related to non-performing loan. On the other hand, unemployment, credit to the private sector and exchange rate exerts positive influence on nonperforming loans in Nigeria. In addition, the study reveals that in the short run, credits to the private sector, exchange rate, lending rate and stock market index are the main determinants of non-performing loans.

2.2.3 Studies in Ethiopia

In the context of Ethiopia, there are few studies that examine factors affecting NPLs of commercial banks. To the knowledge of the researcher there are five studies conducted on determinants of NPLs.

Daniel (2010) on his research entitled “privately owned commercial banks in Ethiopia: issues of non-performing loans” study the management of non-performing loans of private commercial banks in Ethiopia. The research has identified moral hazard of the borrowers, ineffective monitoring, and operational loss of the borrower were the reasons for high NPLs in private commercial banks in Ethiopia during the sample period.

Geletta (2012) assess the determinants of nonperforming loansin Ethiopian commercial banks by adopting mixed research approach. The survey data was collected from both private and state owned commercial banks with the help of self-administered questionnaire and in-depth interview of senior bank officials in the Ethiopian banking industry.A descriptive statistics and correlation matrix were used so as to analyze the data.The findings of the study reveal 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 ascribe to the causes of loan default. However, the study outcome failed to support the existence of relationship between bankssize, interest rate and ownership type of banks and occurrences ofnonperforming loans.

Anisa (2015) conducted a study entitled "determinants of nonperforming loan: an empirical study on commercial banks of Ethiopia". She investigated the determinants of nonperforming loans in Ethiopian commercial banks by combining the bank specific variables with macro-economic variables.Balanced fixed effect panel regression was used for the data of eight commercial banks (two public owned and six private owned banks). The study period covered from 2004 to 2013. Seven factors (four bank specific and three macroeconomic factors) affecting banks nonperforming loan were selected and analyzed. The results of balanced fixed effect panel data regression analysis showed that deposit rate, loan to deposit ratio and lending interest rate had positive and significant impact on banks nonperforming loan. According to the regression result lending interest rate is a very important determinant of nonperforming loan in Ethiopia banking industry. Cost efficiency had negative and significant impact on banks nonperforming loan. Bank solvency ratio and gross national product (GDP) growth rate ad inflation rate had negative and statistically insignificant impact on banks nonperforming loan.

Tesfaye(2015) assess Bank specific determinants of nonperforming loans in Ethiopian private commercial banks. The samples of the study were six banks established before 2010G.C in Ethiopia. The quantitative research approach was adopted for the study and survey conducted with professionals engaged in these private commercial Banks of credit departments using a self-administered questionnaire and in-depth interview. In addition, the study used structured review of documents and records of these banks. The findings of the study shows that poor credit risk assessment, under developed credit culture/orientation, poor understanding of credit terms and

conditions, imposing highest interest rate on loan, poor credit monitoring and rapid credit growth or greater risk appetite for the occurrence of nonperforming loans. However, the study outcome did not support the existence of relationship between banks size and occurrences of nonperforming loans.

Habtamu (2015) assessed bank specific factors affecting occurrence of NPLs in Ethiopian private commercial banks. A survey study research design of six private Banks was employed. Data was collected through Interview and questionnaires to bank officers. The data was carefully coded and entered to SPSS software and analyzed by descriptive statistics. Accordingly the findings of the study showed that the major factors affecting NPLs were poor credit assessment, poor loan follow up, underdeveloped credit culture, lenient credit terms and conditions, knowledge limitation, compromised integrity, unfair competition among banks, fund diversion for unintended purpose and shareholders influences. On the other hand the research found that credit growth, and bank size have no or very minimal relationship with occurrence of NPLs. Findings of the study further indicated that non-performing loans have negatively affected the performance of Ethiopian private banks in terms of credit crunch and profitability.

Recently, Mesay (2017) assess the determinants of non-performing loan growth rate in Ethiopian commercial banks by emphasizing on the manufacturing sector. Specifically the study sought to establish the effect of microeconomic variables (deposit Interest rate, exchange rate and annual inflation rate), bank specific (loan to deposit ratio, credit monitoring and follow-up and loan growth rate) and business characteristic (business profit margin and nature of business). The study used both primary and secondary data. The study target population comprises six Ethiopian private commercial banks and 2 manufacturing sub sectors (food and beverage and textile). The study covers the period from 2000 to 2015 and adopts a mixed methods research approach by combining documentary analysis (structured review of documents) and in-depth interviews. The collected panel data was analyzed using descriptive statics, correlation matrix and multiple linear regression analysis. The findings of the study show that business profit margin, deposit interest rate, loan growth rate, loan to deposit ratio, credit monitoring and follow-up and nature of business statistically significant relationship with banks' NPLs. On the other hand, variables like exchange rate and inflation rate were found to be statistically insignificant.

2.3 Conclusions and knowledge Gap

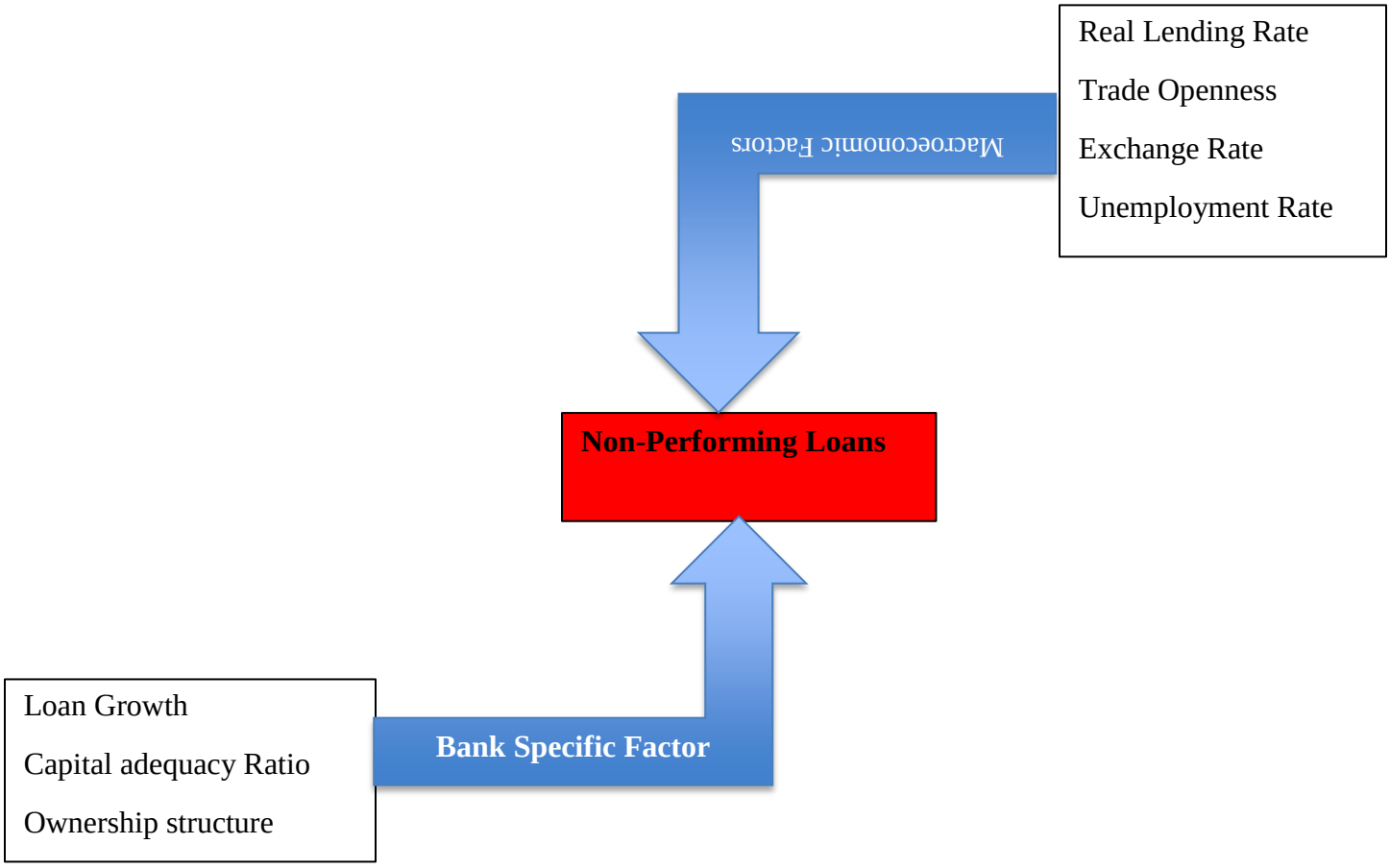
From the above theoretical and empirical reviews it can be concluded that NPLs have a great impact on the operation of banks. The empirical studies show that banks NPLs can be determined by many variables which can be grouped as macroeconomic and bank specific factors. However, Most of the literatures that are discussed so far appeared to have focused on studies that were conducted in the banking sector of different countries outside Ethiopia. Consequently, the Banking sector of Ethiopia has so far received inadequate attention in the literature. Conclusions cannot be made on the causes of NPLs of the banking sector of a given country based on the finding of other countriesbecausethestudies were carried out based on the data from diverse countries. Apart from the data originated from, those literatures by themselves provided contradictory conclusions because of different models and methodologies they used.

In the context of Ethiopia, except for the study of Anisa (2015) and Mesay (2017), the related studies conducted by Daniel (2010), Geletta (2012),Tesfaye(2015) and Habtamu (2015) assessed the determinants of NPLs in Ethiopian commercial banks focusing on bank-specific variables. The study by Anisa (2015) and Mesay (2017) combined both the macroeconomic and bank specific factors but both the studies utilize the same macroeconomic variables. Accordingly, as per the knowledge of the researcher, the macroeconomic determinants of NPLs in Ethiopian banking sector are not sufficiently addressed. Moreover, all the studies except for the study of Mesay (2017) use the data before the year 2013 so the current impact of the determinants on NPLs is not studied.

In general, the lack of adequate research on the determinants of NPLs in Ethiopian banking sector, the focus of most of the existing studies being only on the bank specific determinants of NPLs and the existing knowledge gap initiates this study. Hence, the purpose of this studyis to investigate the determinants of NPLs in Ethiopian commercial banking sector by utilizing an econometrics model so as to estimate both the macroeconomic and bank specific determinants of NPLs of commercial banks in Ethiopia.

2.4 Conceptual Framework

Figure 1: conceptual frame work



Source: developed for the study

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

The preceding chapter has attempted to discuss the theories as well as empirical studies related to determinants of NPLs and their impact on financial performance and finally the existing knowledge gap.

The purpose of this chapter is to present the underlying principles of research methodology and the choice of the appropriate research method for the study. The chapter is arranged as follows: section 3.1 research design and approach, section 3.2 population and sampling design, section 3.3 data collection, presentation and analysis techniques, section3.4 model specification and finally, section 3.5 description of study variables and their expected sign

3.1 Research Design and Approach

Research design is the conceptual structure within which research is conducted; it constitutes the blueprint for the collection, measurement and analysis of data (Kothari, 1990). Depending on the way in which researchers ask their research questions and present their purpose, the research design could be classified into three groups, namely exploratory, descriptive and explanatory studies (Saunders et al., 2009).

Exploratory study is performed when the researcher has little information or when the research problem is badly understood (Hair et al., 2011) and (Ghuari&Gronhaug, 2005).It is particularly useful to clarify the understanding of a problem, such as if you are unsure of the precise nature of the problem (Saunders et al., 2009).

Descriptivestudies are designed to obtain data that describe the characteristics of the topic of interest in the research (Hair et al., 2011). In descriptive research, the research problem is structured and well understood (Ghuari&Gronhaug, 2005). Compared with exploratory study, descriptive study would give the readers reasonable answer addressed to the research question. In other words, it is used for testing hypothesis (Hair et al., 2011).

Explanatory study (causal research design) is devoted to finding causal relationships among dependent and independent variables. It does so from theory-based expectations on how and why variables should be related. Hypotheses could be basic (i.e., relationships exist) or could be directional (i.e., positive or negative) (Schindler and Cooper, 2001).In this type of research, the problems are well structured as in descriptive studies. In contrast to descriptive studies, the researcher is facing with "causes-and-effects" problems. The main task is to separate such causes and to say to what extent they lead to such effects (Ghuari&Gronhaug, 2005).

Based on the above discussion, to achieve the intended objective this study employs explanatory research design.

The primary criterion that should be considered for selecting an approach is the research problem. In view of that, quantitative approach is best if the problem is identifying factors that influence an outcome, the utility of intervention, or understanding the best predictors of outcomes. This approach is also best to test a theory or explanation. Conversely, a qualitative approach is preferable if a concept or phenomenon needs to be understood. Qualitative approach is exploratory, so that it is preferable when the researcher does not know the essential variables to examine (Creswell, 2003). Considering this fact, from the three common approaches to business and social research (quantitative, qualitative and mixed methods approaches) this study adopts quantitative research approach.

3.2 Population and Sampling Design

The target populations for this study are all commercial banks that are registered by NBE and operational in the country. Currently, the country has seventeen commercial banks. Among these banks one is public-owned and sixteen are private owned. From these banks nine commercial banks which have ten years data namely Commercial Bank of Ethiopia (CBE), Awash International Bank S.C (AIB),Dashen Bank S.C (DB), Wogagen Bank S.C (WB), United Bank S.C (UB), Bank of Abyssinia S.C (BOA), Nib International Bank S.C (NIB),Cooperative Bank of Oromia (CBO) and Lion International Bank (LIB) are selected as a sample. These banks are selected with a purposive sampling technique with the criteria of having ten years data.In this type of sampling, items for the sample are selected deliberately by the researcher; his choice concerning the items remains supreme (Kothari, 1990). The researcher considers that the sample size is sufficient to make sound conclusion about the population as far as it covers more than 50%

of the total population and includes the oldest banks which have experienced non-performing loans for a long time compared to the others.

3.3 Data source and collection procedure

The most desirable approach with regard to the selection of the method depends on the nature of the particular problem and on the time and resources (money and personnel) available along with the desired degree of accuracy. The method selected should be such that it suits the type of enquiry that is to be conducted by the researcher. This factor is also important in deciding whether the data already available (secondary data) are to be used or the data not yet available (primary data) are to be collected (Kothari, 1990).

To achieve the stated objectives, this study employs use of secondary data sources which are panel data collected through structured document review. Panel data can better detect and measure effects that simply cannot be observed in pure cross-section or pure time series data (Gujarati, 2004). The data on the bank specific variables are gathered from audited financial statement of selected Commercial Banks while the macroeconomic variables are obtained from National Bank of Ethiopia, central statistical agency (CSA) and from MOFED.

3.4 Data analysis

First, this study collects the needed data from the sources mentioned earlier. After that, collected data are rearranged, edited and calculated in order to become complete data that is needed for this study. Next, these collected data are analyzed by using E-views 9.

3.5Model Specification

The aim of this research is to investigate the relationship between loan growth (LG), financial performance (ROA), capital adequacy ratio (CAR), ownership structure (OWS), gross domestic product (GDP), exchange rate (EXR), inflation (INF), and unemployment rate (UNE) with non-performing loans. The variables are taken from different papers discussed in the empirical literatures taking into consideration the availability of data. The regression model of this study is estimated in the following form:

$$NPL = \beta o + \beta 1(LG)_{it} + \beta 2(RLR)_{it} + \beta 3(CAR)_{it} + \beta 4D(OWS)_{it} + \beta 5(TOP)_{it} + \beta 6(EXR)_{it} + \beta 7(UNE)_{t} + \varepsilon_{it}$$

Where;

- ✓ βo is an intercept,
- ✓ β1, β2, β3, β4, β5, β6, β7,β8 and β9 represent estimated coefficient for specific bank i at time t ,
- ✓ $LG_{i,t}$=loan growth of bank i at time t,
- ✓ RLR_{it} = real lending rate of bank i at time t,
- ✓ CAR_{it}=capital adequacy ratioof bank i at time t,
- ✓ OWS_{it} = ownership structure of bank i at time t,
- ✓ TOP_t = trade openness at time t ,
- ✓ $EXR_{i,t}$ = exchange rate at time t ,
- ✓ UNE_t= unemployment rateat time t
- ✓ ε_{it} = error term

3.6Description of Study Variables and their expected sign

The following table precisely presents the description of variables with their measurement and expected sign.

Table 2: Description of Study Variables and their expected sign

Variables	Notation	Description	Measurement	Expected sign
Dependent				
Non Performing Loan	NPL	Loans that are outstanding both in its principal and interest for a long period of time contrary to the terms and conditions under the loan contract.	Non-performing loans/gross loans ratio	
Independent				
Loan growth	LG	An increase in the amount of loan	Percentage change in loan growth	+
Capital Adequacy	CAR	Capital Adequacy is a reserve of capital	Ratio of total capital to total asset	+/-

Ratio		maintained by banks to protect themselves during adverse situation.		
Ownership structure	OWS		Dummy, "1" denote state owned banks and "0" for private banks	+
Trade openness	TOP	a degree of which countries or economies permit or have international trade with others.	exports plus imports over GDP	+
Exchange rate	EXR	The value of a currency against dollar	Annual Exchange rate of Ethiopian birr in terms of dollar	+/-
Real lending Rate		Real lending rate is a rate at which interest is paid by a debtor for the use of money that they borrow from a lender.	The average lending rate of banks	+
Unemployment rate	UNE	Unemployment refers to the share of the labor force that is without work but available for and seeking employment.	Number of unemployed people divided by the number of people in the labor force	+/-

Source; constructed for the study

CHAPTER FOUR

DATA ANALYSIS AND INTERPRETATION

4.1 Introduction

In the previous chapter the research design employed in this study is presented and discussed in detail. The purpose of this chapter is to present results and analysis of data involved in this study. Accordingly, the descriptive statistics of all the variables used in this study and the results of hypothesis testing i.e. the estimated parameters of the regression equation, their significance, the connection between the independent variables and dependent variable according to the sign and the value of the parameters for the regression model are presented and discussed in detail.

4.2. 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 3. The total number of observation for each variable was 84 (i.e., 10 years data for 9 banks adjusted for some outlier values). 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 3: Summary of descriptive statistics for dependent and independent variables

	NPL	LG	EEXR	CAR	UNE	TOP	OWS	RLR
Mean	0.035414	0.27269	0.171704	0.131669	0.052071	0.388214	0.095238	0.119267
Median	0.02965	0.223656	0.181947	0.124633	0.052	0.41	0	0.1188
Maximum	0.0866	1.576553	0.224137	0.306604	0.059	0.64	1	0.1275
Minimum	0.003	-0.1088	0.092441	0.041973	0.05	0.17	0	0.105
Std. Dev.	0.018864	0.251615	0.040047	0.043893	0.002606	0.136859	0.295307	0.005076
Observations	84	84	84	84	84	84	84	84

Source: Eviews output

This table shows that for the total sample, the mean of NPLs was 3.5% with a minimum of 0.3% and a maximum of 8.6%. This indicates that, from the total loans that Ethiopian commercial banks disbursed, an average of 3.5% were being default or uncollected over the sample period. This ratio is lower than both the Basel standard and National bank of Ethiopia's limit of NPLs ratio which is 5%. This indicates that there is a good movement by ECBs towards minimizing NPLs in the sample years. The disparity between the minimum 0.30% and the maximum 8.6% of NPLs indicate the margin that NPLs ratio of Ethiopian commercial banks ranged over the sample period. The standard deviation (0.0188) of NPLs shows the variation of NPLs among Ethiopian commercial banks. According to Brooks, (2008), a low standard deviation indicates that the data point tend to be very close to the mean, whereas high standard deviation indicates that the data point are spread out over a large range of values.

Among the bank specific independent variables, from the total of 84 observations over the sample period of 2007 to 2016, LG has a standard deviation of 0.251615 which indicates the existence of high variation among Ethiopian commercial banks in terms of their loan growth. The other bank specific variable ownership structure had a higher standard deviation which implies that most banks are privately owned.

On the other hand, among the macroeconomic variables employed in this study trade openness (TOP)had 38.8% mean 41 % median 17% minimum value and a higher standard deviation which was 0.136859. This implies that trade openness in Ethiopia during the study period remains somewhat unstable. On the other hand, the mean of the real lending rate of Ethiopian commercial banks was 10.5% with a standard deviation of 0.67%. The standard deviation of UNE was the lowest of all the variables used in this study. This indicates that the UNE of Ethiopian commercial banks was highly stable over the sample period.

4.3Diagnostic Analysis

Diagnostic tests are robust statistical tests carried out to verify if the data used have met the assumptions underlying the ordinary least squares regression and where possible to remove problems associated with panel data. When the assumptions of classical linear regression model hold true, the coefficient estimators of both α (constant term) and β (independent variables) that are determined by OLS will have a number of desirable properties, and usually known as Best Linear Unbiased Estimators (BLUE). Hence, the following sections discuss results of the

diagnostic tests (i.e., normality, heteroscedasticity, autocorrelationandmulticollinearity) that ensure whether the data fits the basic assumptions of classical linear regression model or not. The diagnostic tests carried out in the study are detailed below.

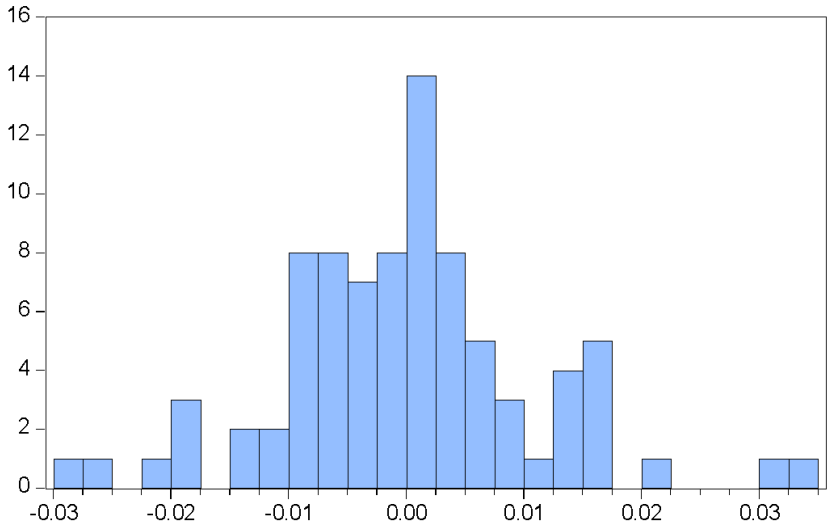
4.3.1 Test for normality

Normality is a condition in which the variables to be used in the model follow the standard normal distribution. The Jarque-Bera statistics was used to test the normality of the variable under different conditions and under the hypotheses;

Ho: The series is normally distributed

H1: The series is not normally distributed

If the series are normally distributed, the histogram should be bell shaped and the Jarque-Bera statistic insignificant. It thus follows that series will be normally distributed at 5% level of significance if the probability of J_B statistic is greater than 0.05. The normality test done for this study is as follow:



As the result shows the J-B probability is greater than 0.05 (i.e. 0.065). Based on this result the null hypothesis is accepted and the data is normally distributed.

4.3.2 Test for Heteroskedasticity

According to (Brooks, 2008), Heteroskedasticity means that error terms do not have a constant variance. If heteroskedasticity occur, the estimators of the ordinary least square method are

inefficient and hypothesis testing is no longer reliable or valid as it will underestimate the variances and standard errors. There are several tests to detect the Heteroskedasticity problem, which are Park Test, Glesjer Test, Breusch-Pagan-Goldfrey Test, White's Test and Autoregressive Conditional Heteroskedasticity (ARCH) test. This study used Autoregressive Conditional Heteroscedasticity (ARCH) test to detect the presence of Heteroskedasticity.

H0: There is no heteroskedasticity problem

H1: There is heteroskedasticity problem

Decision Rule: Reject H0 if P value is less than significant level 0.05. Otherwise, do not reject H0.

Heteroskedasticity Test: ARCH

F-statistic	1.353076	Prob. F(1,73)	0.2485
Obs*R-squared	1.364849	Prob. Chi-Square(1)	0.2427

Source: Eviews output

Based on this result H0 is not rejected (i.e the data is free from hetrosckedastiscity problem).

4.3.3 Test for serial correlation

Serial correlation is usually a result of model mis-specification or genuine autocorrelation of the model error term. In the presence of such a phenomenon, ordinary least squares are no longer BLUE (Best Linear Unbiased estimators). In such cases R-squared may be overestimated. There was thus every need to test for serial correlation in the residuals.

According to Brooks (2008) when the error term for any observation is related to the error term of other observation, it indicate that autocorrelation problem exist in this model. In the case of autocorrelation problem, the estimated parameters can still remain unbiased and consistent, but it is inefficient. The result of T-test, F-test or the confidence interval will become invalid due to the variances of estimators tend to be underestimated or overestimated. Due to the invalid hypothesis testing, it may lead to misleading results on the significance of parameters in the model. Breusch-Godfrey Serial Correlation LM Test was used to detect autocorrelation problem.

The hypothesis for the model specification test was formulated as follow;

H0: There is no autocorrelation problem.

H1: There is autocorrelation problem.

$\alpha = 0.05$

Decision Rule: Reject H0 if P value is less than significant level 0.05. Otherwise, do not reject H0

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.194494	Prob. F(2,74)	0.8237
Obs*R-squared	0.439244	Prob. Chi-Square(2)	0.8028

Source: Eviews output

Based on this result the null hypothesis is not rejected and the data is free from autocorrelation problem.

4.3.4 Test for Multicollinearity

Multicollinearity is an assumption of a linear relationship between explanatory variables that creates biased regression model. This problem occurs when the explanatory variables are Very highly correlated with each other (Brook, 2008). According to (Hair et al., 2006) multicollinearity problem exists when the correlation coefficient among the variables are greater than 0.90. On the other hand, according to Guajarati (2004), if the correlation coefficient is higher than 0.8, it is considered as the model consists of serious multicollinearity problem. If multicollinearity problem is too serious in a model, either additional important variable should be added or unimportant independent variable should be dropped. This study uses high pair-wise correlation coefficients method to detect the existence of multicollinearity. As it appears in the correlation matrix in the below tables all the modes are less than the stated value.

Table 4: Test for Multicollinearity

	LG	EXR	OWS	RLR	TOP	UNE	CAR
LG	1						
EXR	-0.0334	1					
OWS	0.042909	0.099679	1				
RLR	-0.15496	0.618263	0.09936	1			
TOP	-0.00287	0.751229	0.078786	0.594927	1		
UNE	0.141589	-0.11809	-0.00895	-0.10863	-0.03511	1	
CAR	0.224222	-0.15851	-0.57222	-0.19618	-0.12375	0.03125	1

Source: Eviews output

4.4 Model Specification

Model specification error occurs when omitting a relevant independent variable, including unnecessary variable or choosing the wrong functional form. When the omitted variable is correlated with the variable which included, the estimators will be biased and inconsistent and model specification error will tends to occur. If the omitted variable is not correlated with the included variable, the estimators are unbiased and consistent and model specification error will not occur. Therefore, in order to select a correct estimated model, the researcher had carry out the Ramsey-RESET Test to check on the model specification. The hypothesis for the model specification test was formulated as follow;

H0: The model specification is correct.

H1: The model specification is incorrect.

$\alpha = 0.05$

Decision Rule: Reject H0 if P value is less than significant level 0.05. Otherwise, do not reject H0.

Ramsey RESET Test

Equation: UNTITLED

Specification: NPL TOP CAR EXR RLR LG UNE OWS C

Omitted Variables: Squares of fitted values

	Value	Df	Probability
t-statistic	1.716250	75	0.0902
F-statistic	2.945513	(1, 75)	0.0902
Likelihood ratio	3.235841	1	0.0720

Source: Eviews output

Since the p value is greater than 0.05 H0 is not rejected and the model specification is correct.

Model selection criteria (Random vs. Fixed effect model)

In this research the method used in each model is selected based on the Correlated Random Effects-Hausman Test. The Hausman test that examines whether the unobservable heterogeneity term is correlated with explanatory variables, while continuing to assume that regressors are uncorrelated with the disturbance term in each period. The null hypothesis for this test is that unobservable heterogeneity term is not correlated or random effect model is appropriate, with the independent variables. If the null hypothesis is rejected then we employ Fixed Effects method. (Padachi ,2006).

The pooled regression assumes that the intercepts are the same for each firm. This may be an inappropriate assumption; (Brooks, 2008) recommended that we could instead estimate a model with firm fixed effects, which will allow for latent firm specific heterogeneity. The simplest types of fixed effects models allow the intercept in the regression model to differ cross-sectionally.

H0: Random Effects model is appropriate

H1: Fixed Effects model is appropriate

Decision Rule: Reject H0 if p-value less than significance level 5%. Otherwise, do not reject H0.

According to the results presented below the study adopt random effects model

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	1.214614	6	0.9762

Source: Eviews output

4.5 Regression analysis result

EViews regression output is divided into three panels. The top panel summarizes the input to the regression, the middle panel gives information about each regression coefficient, and the bottom panel provides summary statistics about the whole regression equation. The two most important numbers, "R-squared" (the one who answered how much percent of the variance in the dependent variable in the regression accounted for) and "S.E. of regression." and the one that shows how far is the estimated standard deviation of the error term. Five other elements, "Sum squared residuals," "Log likelihood," "Akaike info criterion," "Schwarz criterion," and "Hannan-Quinn criter." are used for making statistical comparisons between two different regressions. The next two numbers, "Mean dependent var" and "S.D. dependent var," report the sample mean and standard deviation of the left hand side variable Brooks, (2008).

"Adjusted R-squared" makes an adjustment to the plain-old to take account of the number of right hand side variables in the regression. Measures what fraction of the variation in the left hand side variable is explained by the regression. The adjusted, sometimes written, subtracts a small penalty for each additional variable added.

"F-statistic" and "Prob (F-statistic)" come as a pair and are used to test the hypothesis that none of the explanatory variables actually explain anything. Put more formally, the "*F*-statistic" computes the standard *F*-test of the joint hypothesis that all the coefficients, except the intercept, equal zero. "Prob (F-statistic)" displays the *p*-value corresponding to the reported *F*-statistic.

The final summary statistic is the "Durbin-Watson," the classic test statistic for serial correlation. A Durbin-Watson close to 2.0 is consistent with no serial correlation, while a number closer to 0 means there probably is serial correlation Brooks, (2008). Hence, as concluded in the Hausmantest above the random effects model is appropriate regression analysis to this study.

4.6 Discussion of Regression results

This section discusses in detail the analysis of the results for each explanatory variable and their importance in determining NPL in Ethiopian commercial banks. The model developed for this study was:

$$NPL = \beta o + \beta 1(LG)_{it} + \beta 2(RLR)_{it} + \beta 3(CAR)_{it} + \beta 4D(OWS)_{it} + \beta 5(TOP)_{it} + \beta 6(EXR)_{it} + \beta 7(UNE)_{t} + \varepsilon_{it}$$

The definition of all individual variables included in the above equation is discussed in the methodology part of the study. The regression result for this model is as follow

Dependent Variable: NPL

Method: Panel EGLS (Cross-section random effects)

Sample (adjusted): 2007 2016

Periods included: 10
Cross-sections included: 9
Total panel (unbalanced) observations: 84
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TOP	0.078996	0.029439	2.683363	0.0089
CAR	0.032239	0.042919	0.751148	0.4549
EXR	-0.614801	0.103148	-5.960368	0.0000
RLR	0.319446	0.307722	1.038101	0.3025
LG	-0.019186	0.005701	-3.365339	0.0012
UNE	-1.033940	0.478739	-2.159715	0.0339
OWS	-0.010272	0.008229	-1.248381	0.2157
C	0.127977	0.045251	2.828141	0.0060

Effects Specification	S.D.	Rho
Cross-section random	0.005835	0.2257
Idiosyncratic random	0.010808	0.7743

Weighted Statistics

R-squared	0.665307	Mean dependent var	0.018217
Adjusted R-squared	0.634480	S.D. dependent var	0.017425
S.E. of regression	0.010601	Sum squared resid	0.008540
F-statistic	21.58200	Durbin-Watson stat	2.274439
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.663831	Mean dependent var	0.035414
Sum squared resid	0.009929	Durbin-Watson stat	1.956290

Source: Eviews output

The estimation results reported above depicted that, The R-squared and Adjusted R-squared values of 0.66 and 0.63 respectively is an indication that the model is a good fit. This means more than 63% of variations in NPLs of Ethiopian commercial banks were explained by independent variables included in the model. However, the remaining 37% changes in NPLs of Ethiopian commercial banks are caused by other factors that are not included in the model. Furthermore, the F-statistic was 21.58 and the probability of not rejecting the null hypothesis that there is no statistically significant relationship existing between the dependent variable (NPL) and the independent variables, is 0.000000 indicates that the overall model is highly significant at 1% and that all the independent variables are jointly significant in causing variation in non-performing loans.

4.7 Discussion of regression result of Independent Variables

Trade openness

H0: Trade openness has positive and significant effect on bank's NPLs.

H1: Trade openness has no positive and significant effect on bank's NPLs.

The coefficient estimate of trade openness measured by the sum of import and export divided by GDP is 0.078996 and statistically significant at 1% significance level (P-value=0.0089). Therefore, the null hypothesis is not rejected. This indicates the existence of strong positive relationship between trade openness and bank's NPLs in ECBs and the fact that it affects NPLs significantly. That means holding other variables constant, an increase in the ratio of international trade to GDP leads to 8% increase in NPLs of ECBs. The relationship between trade openness and a bank is multi-dimensional, though it has positive impact on increasing loan because of its impact on making a county vulnerable to international shocks it results an increase in NPLs. This result is attributable to the existing import based economy which is vulnerable to international shocks. This result is similar with the finding of Mpofu and Nikolaidou (2018).

Capital Adequacy Ratio (CAR)

H0: Capital adequacy ratio of a bank has positive/negative and significant effect on bank's NPLs.

H1: Capital adequacy ratio of a bank has no significant effect on bank's NPLs.

The coefficient of CAR on the regression is 0.032239 and p- value is 0.4549. Holding other variables constant, an increase in the ratio of total capital equity to total assets results a 3% increase in NPLs of ECBs. But since the P-value is greater than 0.05 it is statistically insignificant. Which means in the study period, unlike the result of most prior studies CAR does not have a significant impact on explaining the variability of NPLs in ECBs. This result is consistent with the finding of Louzis et al. (2010). The justification behind this result is high capital adequacy ratio leads banks to involve in high risky activities, create risky loan portfolios but since the loan collection techniques are developed the risky loan portfolios of ECBs are controlled and as a result NPLs does not increase significantly.

Loan Growth

H0: Loan growth of a bank has positive and significant effect on bank's NPLs.

H1: Loan growth of a bank has no positive and significant effect on bank's NPLs.

As it can be seen from the above regression result, a variable used to capture loan growth of a bank (LG) had a coefficient estimate of -0.019186 and statistically significant at 1% significance level (P-value=0.0012). This indicates the existence of strong inverse relationship between loan growth of a bank and bank's NPLs in ECBs. Holding other variables constant, when loan of a bank increases by 1%, NPLs of ECBs decreases by 1%. As a result the null hypothesis is rejected. This result can be traced to the existing centralized loan application evaluation system which enables banks to use their management expertise and reduce risk associated with lending. Furthermore, ECBs began to establish a close relationship with the borrowers through customer relation managers whose major function is reducing information asymmetries between the borrowers and their banks. Each customer relation managers of Ethiopian banks are responsible for the activity of borrowers under their supervision. Hence, the segregated duty provided to each CRMs increase their influence on borrowers management through frequent dealings over time and enable them to get important non public information. Such information advantages allow banks to improve decision making if borrowers face distress. Moreover, a close relationship between a lender and a borrower enables a bank to be better in offering future loan and reduce risk and uncertainty associated with lending.

In this general setting, it can be concluded that, loan growth of a bank was key determinate of NPLs in ECBs. The finding is consistent with previous studies of Pasha and Khemraj (2009), Jellouli et al (2009), and Vogiazas and Nikolaidou (2011).

Exchange rate

H0: Exchange rate has positive/negative and significant effect on bank's NPLs.

H1: Exchange rate has no positive/negative and significant effect on bank's NPLs.

The coefficient of EXR is -0.614801 and it is statistically significant at 1% (p=0.0000). Therefore, the null hypothesis is not rejected. Holding other variables constant, a 1% increase on exchange rate leads to 61% decrease in NPLs of ECBs. This result indicates that exchange rate is the most important determining factor of NPLs in ECBs within the study period. A depreciation of the exchange rate can have mixed implications on NPLs of banks. On the one hand, it can improve the competitiveness of export-oriented firms and ultimately increase their ability to service debt (Fofack, 2005). On the other, it can negatively affect the debt-servicing capacity of borrowers who borrow in foreign currency (import-oriented firms). Since the number of import oriented firms is higher in Ethiopia, the coefficient estimate of exchange rate (EXR) in this particular study is negative association with NPLs of ECBs. This result is inconsistent with the findings of Jajan and Dhal (2003), Fofack (2005), Pasha and Khemraj (2009), De Bock and Demyanets (2012) and Castro (2012).

Real Lending Rate

H0: Real lending rate has positive and significant effect on bank's NPLs.

H1: Real lending rate has no positive and significant effect on bank's NPLs.

The coefficient estimate of real lending rate is 0.319446 and the p-value is 0.3025 this means holding other variables constant, 1% increase in lending rate results a 32% increase in NPLs of ECBs but since the p value is greater than 0.05 the result is insignificant at 5% level of significance. Based on this result RLR does not have significant impact in explaining the variation of NPLs in ECBs in the period 2007-2016.

The E-view result showed that the coefficient estimate of real lending rate (RLR) is positive. This result is in line with the international results from which is concluded that there exists a positive relationship between non performing loans and loan interest rate. According to the researchers, Fofack (2005), Nkusu (2011), Onsarigo, et al., (2013), Louzis et al., (2011) and Jimenez and Saurina (2007), they argue that high increase in interest rate weakens loan payment capacity of

the borrower. The above researchers proved that expected sign of interest rate is positive and insignificant to nonperforming loan. Moreover, Angeloni and Fala (2009) examines that reduction in interest rate will lower down the bank's funding cost and hence the creditor have more ability to repay the loan.

Unemployment Rate

H0: Unemployment rate has positive/negative and significant effect on bank's NPLs.

H1: Unemployment rate has no positive/negative and significant effect on bank's NPLs.

The coefficient estimate of real unemployment rate is -1.033940 and it is significant at 5% (p-value= 0.0339) so the null hypothesis is accepted. This means an increase in unemployment results a decrease in NPLs of ECBs. This result is attributable to the chronic shortage of hard currency that creates unutilized labor due to the dalliance of row materials and products. The longer the queue of accessing hard currency the unproduced output that should have been rendered by labor force of the companies is exacerbated and the organization baring unnecessary wage expenses preference of the organization is to pay the Bank than retaining it is employees in fear of future business with the Bank and goodwill of the organization. The finding is also consistent with the studies of Valahzaghard et al (2012) and Louzis, Vouldis& Metaxas (2012).

Ownership structure

H0: State ownership of a bank has positive and significant effect on bank's NPLs.

H1: State ownership of a bank has no positive and significant effect on bank's NPLs.

The coefficient estimate of OWS is -0.010272 and the p-value is 0.2157 which is statistically insignificant at 5%. Therefore, the null hypothesis is rejected. This result is not consistent with studies mentioned in the literature part not only with the significance level of explaining NPLs but also with the sign of the coefficient. This means in Ethiopian context the ownership of a bank (i.e. whether the bank is state owned or private) does not have effect on NPLs. The justification behind this result is unlike prior studies the existing state bank, CBE, has a profit motive as the private banks do and there exists almost the same credit system in all commercial banks in the country. Moreover, the negative sign implies the considerable amount of loan by the government owned

commercial bank is channeled to government bodies. As the country follows the policy of developmental state, the government is the larger borrower and spender in the country as a result, the state owned bank is reimbursed by the government on time through issuance of currency and bond and through use of treasury single account that enables efficient use of the cash comparing to the private banks that renders the loan service to the private sector in which doesn't have the same luxury to do so by the private counterpart.

CHAPTER FIVE

FINDINGS, CONCLUTIONS AND RECOMMENDATIONS

This chapter presents conclusions drawn from the overall overviews of the research and its main findings. Then recommendations have been forwarded by the researcher based on the findings made.

5.1 Major Findings

The broad objective of this research was to investigate bank specific and macroeconomic determinants of NPLs in Ethiopian commercial banks. To achieve this broad objective, the study used quantitative research approach. To this end, data collected from MoFEC, NBE, CSA and a sample size of nine Ethiopian commercial banks over the period of 2007 to 2016 were analyzed using descriptive statistics, and multiple linear regression analysis.

The regression analyses were made in line with the specific research objectives and stated hypotheses formulated in the study. In doing so, previous studies on determinants of NPLs have been reviewed and as per the literature NPLs of banks usually expressed as a function of internal and external determinants. The internal determinants refer to those factors which characterized individual banks and usually associated with the specific policy choices of a particular bank. On the other hand, the external determinants are variables that are not related to each bank management but reflect the economic environment that can affect the loan quality of banks.

Accordingly, in this study, three bank specific variables (loan growth, capital adequacy ratio and ownership structure) and four macroeconomic variables (real lending rate, trade openness, unemployment and exchange rate) were included. Consequently, the major findings of this particular study are as follow:

- The descriptive analysis of the study confirmed that the average NPL ratio in the sample commercial banks and the sample period is 3.5% which is lower than the Basel standard and NBE's limit of 5 percent.
- Among macroeconomic variables, trade openness, unemployment rate and exchange rate were found to be statistically significant determinants of NPLs in Ethiopian commercial banks. Among this variables unemployment rate and exchange rate exerts a negative effect

on NPLs of ECBs where as trade openness affects NPLs positively. On the other hand real lending rate is found to be insignificant.

- ➢ With respect to the bank specific variables, loan growth, capital adequacy Ratio and ownership structure, only loan growth is found to be a significant variable in explaining the variability of NPLs in ECBs. The rest two variables i.e. CAR and ownership structure are founded to be insignificant on the sample banks and sample period.

5.2 Conclusions

Based on the above finding it can be concluded that Ethiopian Commercial Banks are showing a good performance on avoiding NPLs.

NPLs of Ethiopian commercial Banks are highly affected by macroeconomic factors like trade openness, unemployment, and Exchange rate. Exchange rate is found to be the most significant variable which explains the variation of NPLs in ECBs. This is because the country's economy is import oriented.

Loan growth is found to be a significant variable in explaining the variability of NPLs in ECBs among the bank specific variables. From the bank specific variables CAR and ownership structure are founded to be insignificant in explaining the variation of NPLs of ECBs.

5.2 Recommendations

Based on the findings of the study the following possible recommendations were forwarded:

- Ethiopian commercial banks need to consider the performance of the real economy when extending loans.
- There is need for the government to reduce the strains to the general economy in order not only to facilitate economic growth but also to enhance the minimization of NPLs. The government as well as other stakeholders in the economy should acknowledge the threat that non-performing loans pose not only to the banking sector but also to the general economy. The government must take into account that NPLs can contribute to the collapse of the banking sector and to the entire economy. Furthermore, the government should implement policies that take into account NPLs. The result of this study more specifically indicates that the government should come up with strategies aimed at reducing the impact of trade openness, exchange rate and unemployment rate.

- Finally, the study sought to investigate the determinants of NPLs in Ethiopian commercial banks. However, the variables used in the econometrics model did not include all factors that can affect NPLs of Ethiopian commercial banks. Thus, future research could incorporate external factors such as regulatory environment (loan loss provisions), money supply and corporate governance. It is also recommended for future researchers to study the determinants of NPLs in different economic sectors.

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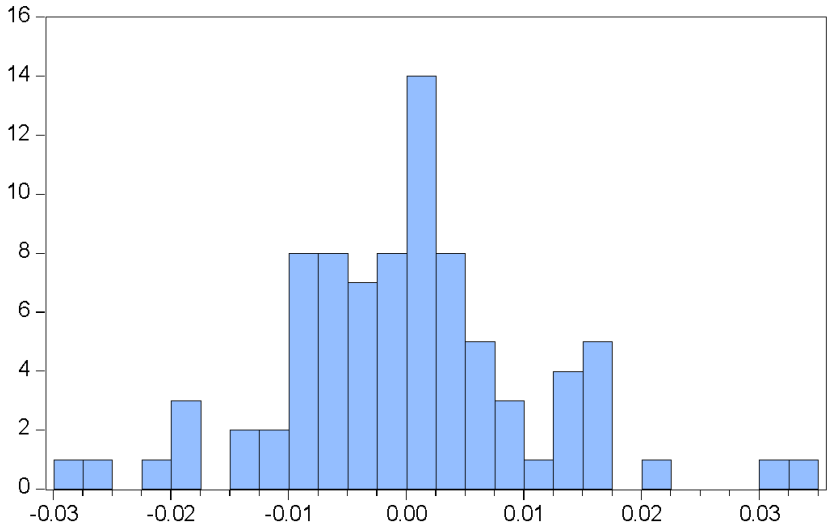
Appendix I: Normality Test



Series: Standardized Residuals	
Sample 2007 2016	
Observations 84	
Mean	3.75e-05
Median	0.000267
Maximum	0.033616
Minimum	-0.027905
Std. Dev.	0.010937
Skewness	0.273000
Kurtosis	4.122666
Jarque-Bera	5.454734
Probability	0.065391

Appendix II: Autocorrelation test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.194494	Prob. F(2,74)	0.8237
Obs*R-squared	0.439244	Prob. Chi-Square(2)	0.8028

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 04/30/18 Time: 13:14
Sample: 1 98
Included observations: 64
Presample and interior missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TOP	-0.000757	0.031433	-0.024081	0.9809
CAR	-0.002171	0.037655	-0.057664	0.9542
EEXR	0.004605	0.109941	0.041883	0.9667
RLR	-0.021760	0.326660	-0.066614	0.9471
LG	-4.07E-05	0.005420	-0.007500	0.9940
UNE	-0.058836	0.521442	-0.112833	0.9105
OWS	-2.56E-05	0.005362	-0.004782	0.9962
C	0.005476	0.048238	0.113515	0.9099
RESID(-1)	0.061712	0.120480	0.512221	0.6100
RESID(-2)	0.034254	0.121773	0.281293	0.7793

R-squared	0.005229	Mean dependent var	-5.78E-18
Adjusted R-squared	-0.115757	S.D. dependent var	0.010935
S.E. of regression	0.011550	Akaike info criterion	-5.972894
Sum squared resid	0.009872	Schwarz criterion	-5.683511
Log likelihood	260.8615	Hannan-Quinn criter.	-5.856564
F-statistic	0.043221	Durbin-Watson stat	2.096142
Prob(F-statistic)	0.999988		

Appendix III: Heteroskedasticity Test

Heteroskedasticity Test: ARCH

F-statistic	1.353076	Prob. F(1,73)	0.2485
Obs*R-squared	1.364849	Prob. Chi-Square(1)	0.2427

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 04/30/18 Time: 13:15
Sample (adjusted): 2 98
Included observations: 84 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000104	2.96E-05	3.509104	0.0008
RESID^2(-1)	0.135323	0.116335	1.163218	0.2485

R-squared	0.018198	Mean dependent var	0.000121
Adjusted R-squared	0.004749	S.D. dependent var	0.000221
S.E. of regression	0.000221	Akaike info criterion	-13.97189
Sum squared resid	3.56E-06	Schwarz criterion	-13.91009
Log likelihood	525.9457	Hannan-Quinn criter.	-13.94721
F-statistic	1.353076	Durbin-Watson stat	2.166335
Prob(F-statistic)	0.248529		

Appendix IV: Ramsey Test

Ramsey RESET Test
Equation: UNTITLED
Specification: NPL TOP CAR EXR RLR LG UNE OWS C
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	1.716250	75	0.0902
F-statistic	2.945513	(1, 75)	0.0902
Likelihood ratio	3.235841	1	0.0720

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.000375	1	0.000375
Restricted SSR	0.009924	76	0.000131
Unrestricted SSR	0.009549	75	0.000127

LR test summary:

	Value	df
Restricted LogL	260.6413	76
Unrestricted LogL	262.2593	75

Unrestricted Test Equation:
Dependent Variable: NPL
Method: Least Squares
Sample: 1 98
Included observations: 84

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TOP	-0.043223	0.077745	-0.555962	0.5799
CAR	0.016105	0.037886	0.425097	0.6720
EEXR	0.186848	0.481011	0.388449	0.6988
RLR	0.195865	0.325407	0.601908	0.5491
LG	-0.000532	0.011613	-0.045774	0.9636
UNE	0.194451	0.879725	0.221036	0.8257
OWS	-0.002880	0.006767	-0.425648	0.6716
C	-0.035589	0.106206	-0.335095	0.7385
FITTED^2	13.78937	8.034594	1.716250	0.0902

R-squared	0.676708	Mean dependent var	0.035414
Adjusted R-squared	0.642223	S.D. dependent var	0.018864
S.E. of regression	0.011284	Akaike info criterion	-6.029982
Sum squared resid	0.009549	Schwarz criterion	-5.769538
Log likelihood	262.2593	Hannan-Quinn criter.	-5.925286
F-statistic	19.62352	Durbin-Watson stat	1.971050
Prob(F-statistic)	0.000000		

Appendix V: Panel Random Regression

Dependent Variable: NPL
Method: Panel EGLS (Cross-section random effects)
Sample (adjusted): 2007 2016
Periods included: 10
Cross-sections included: 9
Total panel (unbalanced) observations: 84
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TOP	0.078996	0.029439	2.683363	0.0089
CAR	0.032239	0.042919	0.751148	0.4549
EEXR	-0.614801	0.103148	-5.960368	0.0000
RLR	0.319446	0.307722	1.038101	0.3025
LG	-0.019186	0.005701	-3.365339	0.0012
UNE	-1.033940	0.478739	-2.159715	0.0339
OWS	-0.010272	0.008229	-1.248381	0.2157
C	0.127977	0.045251	2.828141	0.0060

Effects Specification	S.D.	Rho
Cross-section random	0.005835	0.2257
Idiosyncratic random	0.010808	0.7743

Weighted Statistics

R-squared	0.665307	Mean dependent var	0.018217
Adjusted R-squared	0.634480	S.D. dependent var	0.017425
S.E. of regression	0.010601	Sum squared resid	0.008540
F-statistic	21.58200	Durbin-Watson stat	2.274439
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.663831	Mean dependent var	0.035414
Sum squared resid	0.009929	Durbin-Watson stat	1.956290