DETERMINANTS OF NON-PERFORMING LOAN: IN CASES OF COMMERCIAL BANKS OF ETHIOPIA

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Statement of Declaration

I Wondwosen Ashenafi have carried out independently a research work entitled ***" determinants of non-performing loan: in cases of commercial banks of Ethiopia "***in partial fulfillment of the requirement of BA Degree in Accounting and Finance with the guidance and support of the research advisor. I do hereby declare that this research paper is my original work and that it has not been submitted by any other person for an award of degree in this or any other university/institution.

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ABSTRACT

The main goal of Ethiopian commercial banks is to operate profitability in order to maintain economics stability and improve growth and sustainability. However, Ethiopian commercial banks experience high levels of Non-performing loans. This trend threatens viability and sustainability of banks and hinders the achievement of their goals. This study aimed to examine the determinants of Non-performing loans. Specifically, the study to examine the effect of macroeconomic variables (Growth domestic product, and annual inflation rate), and bank specific variables (loan to deposit ratio, Capital Adequacy Ratio, Profitability and Bank Size). The study used secondary data. The target population of the study comprises all Ethiopian commercial banks. And also the study used explanatory research design with a quantitative research approach by combining documentary analysis (structured review of documents). More specifically, the study reviews the financial records of ten commercial banks from the total target population for the period 10 years from the year 2009 to 2018. The study used panel data. The collected panel data is analysed using descriptive statics, correlation matrix, normality test and multiple linear regression analysis by using Eviews 8 software program. The findings of the study show that, loan to deposit ratio, and Bank Size were statistically significant relationship with banks' NPLs. On the other hand, variables like Profitability, Growth domestic product, Capital Adequacy Ratio and annual inflation rate were found to be statistically insignificant. Base on the finding the study recommended that the future researches should investigate by increasing the number of samples and by including new determinants variables of NPLs. And also using other advanced techniques. The study then suggests that bank loan officers should constantly monitor each borrower's circumstances to detect loan problems before they become uncorrectable.

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

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Acronyms

AIB: Awash International Bank

BOA: Bank of Abyssinia

CEF: Cost efficiency

CBE: Commercial Bank of Ethiopia

DB: Dashen Bank

GDP: Gross Domestic Product

INF: General inflation rate

LTD: Loan to deposit ratio

Mo FED: Ministry of Finance and Economic Development

NBE: National Bank of Ethiopia

NIB: Nib international Bank

NPL- Nonperforming loan

WB: Wogagen Bank

CHAPTER ONE

1 INTRODUCTION

1.1 Background of the study

Economic growth in any country is not possible without a sound financial sector (Raja Raman 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).

Loan means any financial facets of a bank arising from a direct or indirect advance or commitment to advances funds by a bank to a person that are conditioned on the obligation of the person to repay the funds either on specified dates or on demand usually with interest. 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 causes of 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).

Generally, there is a robust association between banks NPLs and several bank specific variables along with macroeconomic variables. From bank specific variables some of them are cost efficiency, profitability, loan to deposit ratio and, bank size etc. have significant influence on the NPLs. However, the uniqueness of banking sector, banking polices, efficiency maximization efforts and risk reduction polices also have significant impact on the quality of loans. From the external or macro level factors, real GDP growth rate, inflation rate, etc. have a significant impact on the rate of NPLs. In our country the most important function of commercial banks in the area of financial intermediation are deposit mobilization and lending activities. This study would be examines the determinants of NPLs, in commercial bank of Ethiopia by using both macroeconomic (Growth domestic product, and annual inflation rate), and bank specific variables *(*loan to deposit ratio, Capital Adequacy Ratio, Profitability and Bank Size

1.2 Statement of the Problem

The Issues of Nonperforming Loans (NPLs) gained increasing attentions in the past few decades. A Poor loan management has a good contribution to Manage NPLs. It was a crucial issue for every bank to manage bad loan. Money countries are suffering from non-performing loans (NPLs) in which banks are unable to get profit out of loans (Peterson and Wadmans, 2004). If the loan is well managed; it will increase the bank's profitability and sustainability in the future. However, if failed to do so, it will be the major threat to their survival (MacDonald, 2006).NPLs affect the bank`s liquidity and profitability which are the main components for the overall efficiency of the bank. An increase in NPLs provision diminishes income. Again, mismatch of maturities between asset and liability create liquidity risk for the banks that deteriorate bank`s overall credit rating including Its image (Badar and Yasmin, 2013). Therefore, the determinants of NPLs should be given a due consideration because of its adverse effect on survival of banks. Non-performing loans are one of the determinant factors for the soundness of the banking sector. At the same time non-performing loan rate is the most important issue for banks to survive. The issue of non-performing loan has, therefore, gained increasing attentions since the immediate consequence of large amount of NPLs in the banking system is a cause of bank failure. It is accepted that the quantity or percentage of non-performing loan (NPLs) is often associated with bank failures and financial crises in both developing and developed countries. (Caprio and Klingebie,2000 sited in Wanjau Ketal. 2011). In Ethiopian context, Banks found in the country are required to maintain ratio of their non-Performing loans below five percent (NBE,2008).Although banks loan collection ability in Ethiopia increase from time to time, the average has not reached on the amount that are required by national bank of Ethiopia. While quite number of studies has been investigated on the determinants of NPL, most of these studies have been done in developed countries with few being done in developing countries. In Ethiopia as to the researcher knowledge, Wondim agegnehu (2012) conducted a study on determinants of NPLs, focusing only banks specific factors that cause NPLs, by using mixed research approach method. So in this study the researcher wants to saw the determinants of NPLs, in commercial bank of Ethiopia by using both macroeconomic and bank specific variables and also adopt a quantitative type of research approach.

1.3 Objective of the Study

This paper both a general and specific objective while identifying the problem of non-performing loan in case of commercial banks of Ethiopia.

1.3.1 General Objective

The general objective of this study is to examine the determinants of non -performing loans in cases of commercial banks of Ethiopian.

1.3.2 Specific Objective

- To identify the effect of GDP growth rate on non-performing loans in cases of Commercial Bank of Ethiopia.
- To examine the effect of capital adequacy on non-performing loans in cases of Commercial banks of Ethiopia.
- To discover the effect of bank size on non-performing loans in cases of commercial banks of Ethiopia.
- To identify the effect of loan to deposit ratio on non-performing loans in cases of commercial banks of Ethiopia.
- To examine the effect of profitability on non-performing loans in cases of commercial banks of Ethiopia.
- To investigate the effect of inflation rate on non-performing loans in cases of commercial banks of Ethiopia.

1.4 Research Hypothesises

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 banks NPLs the researcher has formulated the following six Hypotheses in line with the broad objective of the study.

H1: Loan to deposit ratio (LTD) has positive and significant relation with Non-performing loansin commercial banks of Ethiopia.

H2: Return on asset (ROA) has negative and significant effects on Non-performing loans (NPLs)in commercial banks of Ethiopian.

H3: Bank size (BS) has negative and significant relation with Non-performing loans of commercial banks in Ethiopia.

H4: Capital adequacy ratio (CAR) has negative and significant impacts with Non-performing loans (NPLs) in commercial banks of Ethiopia.

H5: Inflation rate (INF) has negative and significant relation with Non-performing loans (NPLs) in commercial banks of Ethiopia.

H6: annual GDP growth rate (GDP) has positive and significant impacts with Non-performing loans (NPLs) in commercial banks of Ethiopia.

1.5 Scope of the study

This study concentrates only on commercial banks which have ten and more over years working experience in their operations and also year's establishment. Moreover, the researcher wants to saw factors that affect the level of NPLs in commercial bank of Ethiopia. even though there are sixteen commercial banks in Ethiopia, the current study selects only ten commercial banks in Ethiopia that have an available audited financial statements (data) from (2009 to 2018). His study considers on both bank specific factor such as, profitability, loan to deposit ratio, capital adequacy ratio and bank size and macro-economic factors inflation, and GDP. This research based on intensive secondary data review. From different sources document secondary data is more preferable in this study in time, fund, energy etc. Whiledose this research there were some limitation to design this research. The limitation was shortage of time, a finance resources to undertake detail study, lack of experience i.e. deep knowledge, the problem of getting full information about the organization and other problem face in this study lack of skill and available computer access were some factors that resistance in this study of the researcher on non-performing loan in commercial banks of Ethiopia.

1.6 Significance of the study

The purpose of this research is expected to contribute a lot for different stakeholders. The following are significance of this study:

- The current study benefits the researcher to obtain new knowledge about problems under the Study and gives clear picture about the commercial banks of Ethiopia.
- This study helps to present the current picture of NPLs in commercial banks of Ethiopia. And it also helps to show the significant factors (internal as well as external) factors that determine NPLs in commercial banks of Ethiopia.
- The study serves as a starting point for other studies, which may focus on similar Topics and issues related to non-performing loan.
- Furthermore, the study will enable to know commercial banks (lenders) how-to overcome potential factors that are highly affects the level of non-performing loan in Ethiopia banking industry.
- The outcomes of the study may minimize the literature gap in the area of study particularly in Ethiopia.
- In addition to the study will also contribute to the existing body of knowledge regarding to the determinants of non-performing loans in commercial banks of Ethiopia.
- And to motivate further research on Ethiopian Banking industry and more specifically on macroeconomic and banks specific determinants of Non-performing loans in commercial banks of Ethiopia.
- Generally; this study will help to Ethiopian banks get insight on what it takes to improve their loan qualities and the central bank (NBE) to examine its policy in banking supervision pertaining to ensuring asset quality banks maintain.

1.8 Organization of the Paper

The study would be covers five chapters. The first chapter includes background of the study, statement of problems, objective of the study (general and specific), significance of the study, scope of the study and limitation of the study. The second chapter deals with the review of literature theoretical and empirical studies of loans broadly NPLs in banking industry. Chapter three would include research design and methodology of the study. Chapter four also contain analysis, discussion and results and thelast chapter may deals with the Conclusions drown and recommendations that originates from the analysis. Based on the results of the study the last chapter (chapter five) gives a brief conclusions and recommendations. Finally, list of figures, graphs and tables would be attached as an appendix.

CHAPTER TWO

2. REVIEW OF RELATED LITERATURE

2.1 INTRODUCTION

The preceding chapter deals on the introductory part of the study i.e. the motive behind conducting this study. The purpose of this chapter is to review the existing literatures concerning on the area of NPLs(nonperforming loans) and factor that affect the level of NPLs i.e. internal (bank specific) as well as external (macroeconomic) factor in the banking industry. The current chapter has three sections and organized as follows. The first section (2.1) presents the theoretical reviews on NPLs; it includes nature and definition of NPLs, Classifications of Loans and advances and theories on bank loan and cause for loan default. Second section (2.2) similarly reviews different empirical results regarding the impact of various banks specific and macro level factors on the growth of nonperforming loan rate. Finally, section three (2.3) deals with conclusion of the chapter and knowledge gap that inspire this study.

2.1.1 Theoretical Review

This section discusses the theory of banking with major focus on role of banks and their lending activities and theories.

2.1.2 Banking

Banks are financial institutions that accept deposits from the general public and obtain money from such other sources as may be available to them (the' haves') in order to extended loans to those in need of the money (the' have-nots') . As Goosen et al.(1999) put it, banks provide channel (financial intermediation) for linking those who have excess funds with those who are in need of funds, thus ensuring the money available in economy is always put to good use. In so doing banks earn income when they lend money out at a higher interest rate than they pay depositors for use of their money. A Bank's main source of income is interest. A bank pays out at a lower interest rate on deposits and receives a higher interest rate on loans. The difference between these rates represents the bank's net income. Banks and other financial institutions exist in order to earn a profit and to ensure that shareholders value is maximized. Currently in most jurisdictions commercial banks are regulated by government entities such as central

banks and require a special bank license to operate. The requirements for the issue of a bank license vary between jurisdictions but typically include: Minimum capital, Minimum capital ratio (how do we arrive at this ratio?) , 'Fit and Proper' requirements for the bank's controllers, owners, directors, or senior officers, approval of the bank's business plan as being sufficiently prudent and plausible.

2.1.3 Role of Banks

The banking sector makes a meaningful contribution to the economic growth of every country. Banks contribution to the growth lies in the role they play in mobilizing deposits and allocating the resources efficiently to the most productive uses investment in the real sector. So making credit available to borrowers is one means by which banks contribute to the growth of economies. Banks pool resources together for projects that are too large for individual shareholders to undertake (Bagehot, 1873).

Money creators: Commercial banks create money by way of deposit liabilities. In contrast to liabilities of other businesses, bank liabilities (cheques) are generally accepted as a means of payment. Managers of the payment system: This refers to the Payment of cheques through the Automatic Clearing Bureau (ABC). It also facilitates payments of credit and debit cards, internet and cell phone banking and automatic teller machines. Creators of indirect financial securities: Commercial banks hold assets that are subject to specific risks, while issuing claims against them in which these risks are largely eliminated through diversification. Information agents: Commercial banks developed sound databases of client information and the information is not publicly available (asymmetric information). The information is only shared with other banks by way of a bank code or a full general bank report. Financial spectrum fillers: The capital market cannot supply the full range of instruments required by borrowers. Commercial banks assist in this regard by supplying specific instruments to fill the gap.

2.1.4 Nature and Definition of Nonperforming Loan

The principal activity of commercial banks is making loans to its customers. In allocating funds, the primary objective of bank management is to earn income while serving the credit needs of its community. Lending represents the heart in banking industry. Loans are the dominant asset and represent fifty percent to seventy-five percent to the total amount of banks assets. In most banks loans generate the largest share of operating income and represent banks greater risk exposure (Mac Donald and Koch, 2006). Loans and advances

are the most profitable of all assets of a bank. 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 (M. Radar, and SV. Vasudevan. 1980). from management accounting point of view, bank asset quality and operating performance are positively related. If a bank's18 asset quality is inadequate

(*e.g*.theloanamountbecomestheamounttobecollected),thebankwillhavetoincreaseitsbad debt losses as well as spend more resources on the collection of non-performing loans, this increase non-performing loans(Hassan.S.2010). Non-Performing Loan (NPL) is one of the concrete embodiments of credit risk which banks take. The high amount of NPLs represents high credit risk in today banking system and this encounters banks with market risks and liquidity risk. They have greater implication on the function of banks as well as overall financial sector development (Ekrami and Rahnama, 2009).In line with the above idea Dumont .et. Al (2004) found the accumulation of nonperforming assets to be attributable to economic downturns and macroeconomic volatility, terms of trade deterioration, high interest rates, excessive reliance on overly high-priced interbank borrowings, insider lending and moral hazard. HR Machiraju (no date) sited in Wondim agegnehu N (2011) clearly point out non- performing loans as a leading indicator of credit quality for banks. Bhide, *et.al.* (2003) has noted among various indicators of financial stability, banks non-performing loan assumes critical importance since it reflects on the asset quality, credit risk and efficiency in resources allocation to productive sectors.

Nonperforming loan is also defined from institutional point of view. According to the IMF, 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, capitalized, or delayed by agreement; or payments are less than 90 days overdue, but no longer anticipated. Another definition of a non-performing loan is one in which the maturity date has passed but at least part of the loan is still outstanding. The specific definition is depending upon the loan's particular terms. Non -performing loans can also be defined as defaulted loans, which banks are unable to profit from it. Usually loans fall due if no interest has been paid in 90 days, but this may vary between different countries and actors. Defaulted loans force banks to take certain measures in order to recover and securitize them in the bestway. 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 (NBE, 2007). It further provides that loans or advances with pre-established repayment programs are nonperforming when principal and/ or interest is due and uncollected for 90 (ninety) consecutive days or more beyond the scheduled payment date or maturity.

Therefore, loans become nonperforming when it cannot be recovered within certain stipulated period of time that is governed by some respective laws. Generally, from the above definition NPL is loan that is not earning income; Full payment of principal and interest is no longer anticipated; principal or interest is 90 days or more delinquent or; the maturity date has passed and payment in full has not been made.

2.1.5 Theories underpinning non-performing loans

Three theories under pinning non-performing loans have been explained by Warue (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. This contraction 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) fromcurrent 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.

2.2 Determinants of Nonperforming Loan

Despite the fact that loan is major source of banks income and constitutes their major assets, it is risky area of the industry. That is also why credit risk management is one of the most critical risk management activities carried out by firms in the financial services industry. In fact, from all risks banks face, credit risk is considered as the most dangerous as bad debts would impair banks profit. It has to be noted that credit risk arises from uncertainty in a given

counterparty's ability to meet its obligations. The solidity of banks portfolio depends on the health of its borrowers. In many countries, failed business enterprises bring down the banking system (Alemu, 2001, sited in W.N. Geletta, 2011). A sound financial system, among other things, requires maintenance of a low level of non- performing loans which in turn facilitates the economic development of a country.

2.2.1Gross Domestic Product

The performance of any type's loans is highly related to country's economic condition Keeton and Morris (1987). A strong economic condition measured by GDP, as motivated factor to bank statically significant impact on issuance of more private credit to business and increase investment; per income capital (Kashif and Mohammed).

GDP= annual GDP growth rates

2.2.2Profitability

Comptroller's Handbook (1998), states that lending is the principal business activity for most commercial banks. The loan portfolio is typically the largest asset and the predominate source of revenue. As such, it is one of the greatest sources of risk to a bank's safety and soundness. Since loans are illiquid assets, increase in the amount of loans means decrease bank solvency. According to Pilbeam (2005, p. 42), in practice the amount of liquidity held by banks is heavily influenced by loan demand that is the bases for loan growth. If demand for loans is weak, then bank tends to hold more liquid assets (i.e. short-term assets), whereas if demand for loans is high they tend to hold less liquid assets since long-term loans are generally more profitable. Therefore, bank solvency has negative impact on banks nonperforming loan and vice versa. According to Brown, Mallet and Taylor (1993), bad loans (NPLs) cause, reducing the capital resource of the bank, affects its ability to grow and develop its business. Disclosure of the extent of losses in its financial statements may lead to a loss of confidence in the banks management and a reduction in its credit ratings.

$$\text{ROA} = \frac{\text{Total profit before tax}}{\text{Total assets}}$$

2.2.3 Loan to deposit ratio

Loan to deposit (LTD) ratio examines bank liquidity by measuring the funds that a banks has utilized into loans from the collected deposits. It demonstrates the association between loans

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

$$LTD = \frac{\text{Total deposit}}{\text{Total loan}}$$

2.2.4 Rate of Inflation

Macroeconomic instability which is mostly manifested by high inflation rate also makes loan appraisal more difficult for the bank, because the viability of potential borrowers depends upon unpredictable development in the overall rate of inflation. Moreover, asset prices are also likely to be highly volatile under such conditions. Hence, the future real value of loan security is also very uncertain that banks do poorly both when product and asset price prudential policy, inflation accelerates unexpectedly, unemployment increases, and/or aggregate output and income decline unexpectedly. Unexpected accelerations in inflation adversely affect banks performance, by increasing the rate of loan default and decreasing banks profit (Martin Brownbrigde, 1998, sited in W. N. Geletta, 2011).

INF = annual inflation rate

2.2.5 Capital Adequacy Ratio (CAR)

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

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

Total asset

2 .2.6 Bank Size

Study by Cole et al. (2004) used data obtained from the 1993 Federal Reserve National Survey of Small Business Finance and bank financial reports, suggest that smaller banks adopt small business loan underwriting practices that are riskier than those of larger banks, riskier in that small banks prefer to lend to small firms that lack hard financial data to support the lending decision and riskier to the extent that the failure rates of small businesses are higher than those of larger, established firms In their study of commercial banks in India, by use of panel regression analysis Rajan and Dhal (2003) indicates that , banks size have significance on occurrence of NPLs . Salas and Saurian (2002) indicated that bank size, is among the factors that explained variations in NPLs for Spanish banks. Studies by Berger and DeYoung, 1997, for the US; Jimenez and Saurian, 2006, for Spain; Quagliariello, 2007, for Italy; Pain, 2003, for the UK; and Bikker and Hu, 2002, for 29 OECD countries) also shows that Bank size is significantly related rate of occurrence of loan default.

BS= the logarithm of total assets

2.2.7 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;

2.2.8 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 study employed 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 reveals that 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 growth and appreciation 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 and ROA and 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.

2.2.9 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 Saurian (2002) analyze problem loans of the Spanish commercial and savings 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. Farhanetal. (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 variables on NPLs. 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 risk on 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 sectors loan, priority sectors 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 as macroeconomic 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.

2.2.9.1 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. 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 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.

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 Conceptual Frame Work

The main objective of this study is to examine the determinants of NPLs in commercial banks of Ethiopia. Based on the previous literature review parts, non-performing loans are affected by both banks specific and macroeconomics factors. Bank specific factors are profitability, loan to deposit ratio, cost efficiency and bank size; whereas macroeconomics factors, GDP and inflation rate. The blue color part represents the dependent variables (non-performing loan) used in this study. The main objective of this conceptual frame woke would be to clear for the user or any other reader easily to understand the research idea. Generally; this conceptual frame work model to summarize the man focus and scope of this study in terms of variables.

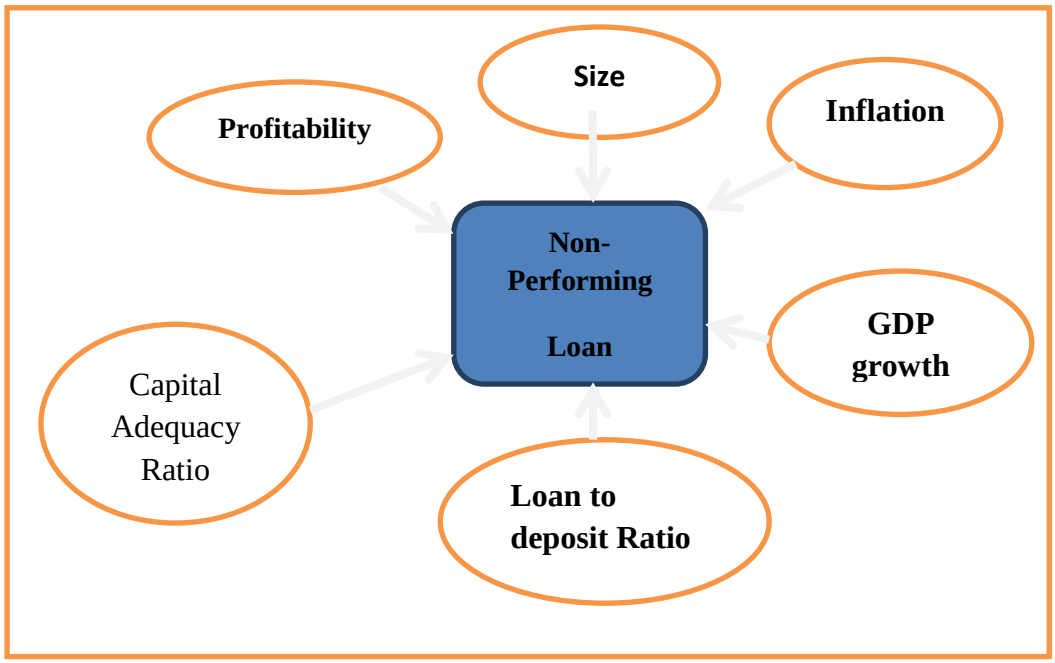


figure 2. 1Conceptual framework

Source; - constructed by their Owen

2.4. Summary and Knowledge Gap

A plenty of studies are investigating on determinants of NPLs in different countries. Even though, the determinants of NPLs are still debatable among different researchers that might be due to situational factors like country level factors, bank level factors and the condition of legal and regulatory framework of the country. Thus, these debates can only be resolve through quantitative analysis on the determinants of NPLs. Besides, most of the related literatures reviews cover different studies made both in developing and developed countries' banking industries. Even if quite numbers of studies have investigated on the determinants of NPLs, most of these studies have been done in developed countries with few being done in developing countries. Thus, as to the knowledge of the researcher, there is still limited number of literatures in Ethiopian banking industry, with the exception of a single study made by Wondim agegnehu (2012) on the determinants of NPLs of banking industry in Ethiopia. Hence, this previously done study by Wondim agegnehu (2012) utilized only bank specific factors. Wondim agegnehu (2012)

Considers interest rate as bank specific factors and revealed as interest rate has no influence on the level of NPLs. Furthermore, banks profitability and capital adequacy ratio that considered as basic determinants of NPLs were not included in his study since these variables are widely used by different researchers. Besides, even if taxation is not used in further study before, the researcher adds as one of the determinant factors of NPLs in this study based on theoretical literatures and its sensitivity in the country specifically in Ethiopia. Likewise, due to rapid expansion of banking institution in Ethiopia, it is better to conduct this investigation to ensure their continuous operation. This study therefore, seeks to fill this gap by establishing the link between non-performing loans and its determinants (bank specific and macroeconomic factors) in case of commercial banks in Ethiopia.

CHAPTERTHREE

3. RESEARCHMETHODOLOGY

Introduction

Under this chapter is to provide brief outline of the broad objectives of the study and the underlying principle of research methodology and the choice of the appropriate research method for the study. The chapter is arranged as follow: methodology of the study, research approach, research design, data type and sources, population, data collection, variables specifications and methods of data presentation are list as follows.

3.1. Research Approach

As noted in Creswell (2003), in an investigative study there are three familiar types of research approaches to business and social research namely, quantitative, qualitative and mixed methods approach. Creswell (2009) defined quantitative research as a formal, objective and systematic process in which numerical data are utilized to obtain information. Mmuya (2007) stated that qualitative research is an investigative methodology that is grounded in a philosophical position that focuses on making sense of the social world through a process involving how it is experienced, understood and interpreted. The qualitative method takes a theoretical and methodological focus on complex relations between personal and social meanings, individual and cultural practices and the material environment or context. Whereas, mixed research is characterized as the combination of both qualitative and quantitative research approaches. Considering the research problem and objective along with the philosophy of the different research approaches, the quantitative nature of the data collected, quantitative research approach was found to be appropriate for this study Besides, this study would be uses mixed research approach to examine a stated objective because quantitative research is a systematic and scientific investigation of quantitative properties and phenomena and their relationships (Abiy, 2009).

3.2 Research Design

Research design is a master plan specifying the methods and procedures for collecting and analyzing the required data. The choice of research design depends on objectives that the researchers want to achieve (John, 2007). Since this study was design to examine the relationships between NPLs and its determinants, a logical reasoning either deductive or inductive is required. Deductive reasoning starts from laws or principles and generalizes to particular instance whereas inductive reasoning starts from observed data and develops a generalization from facts to theory. Besides, deductive reasoning is applicable for quantitative research whereas inductive reasoning is for qualitative research. Thus, due to quantitative nature of data, the researcher used deductive reasoning to examine the cause and effect of relationships between NPLs and its determinants in this study. As noted by Kothari (2004), explanatory research design examines the cause and effect relationships between dependent and independent variables Therefore, since this study would be examining the cause and effect relationships between non-performing loans and its determinant; it is an explanatory research design.

3.3 Data type and sources

The data types were secondary data and analyses by explanatory design that are the financial statements of the banks that comes from the National banks of Ethiopia and this study was use panel data. The researcher prefers to used panel data since panel data can take heterogeneity among different units into account over time by allowing for individual-specific variables. Besides, by combining time series and cross-section observations, it gives more informative data. Furthermore, panel data can better detect and measure effects that simply cannot be observe in pure cross-section or pure time series data. The researcher used secondary sources of data that is panel in nature. A secondary source of data was preferred by the researcher since it is less expensive in terms of time and money while collecting. And also, it affords an opportunity to collect high quality data. Secondary data may either be published or unpublished data. Those secondary data can obtain from the audited annual financial statements of the concern commercial banks in Ethiopia (NBE). These data include both bank specific and macroeconomics factors.

3.4 Population and Sampling determination

The total populations of the study are all commercial banks in Ethiopia and there are seventeen commercial banks in Ethiopia. Excluding development bank and also construction and businesses banks merge to commercial bank of Ethiopia. Among these the researcher wants to select some commercial banks which have at least ten years working experience in Ethiopia (i.e. from 2009 to 2018). Sample design deals with sample frame, sample size and sampling technique. Sampling is a technique of selecting a suitable sample for the purpose determining parameters of the whole population. There are sixteen banks in Ethiopia. From This (CBE), (AIB), (BOA), (WB), (NIB), (CBO), (OIB), (LIB) (UB), (DB), are banks in Ethiopia which have more experiences in landing activity. This study employed non probability purposive sampling technique to select the required sample of banks from the commercial banks of Ethiopia since it is viable in line with time and funds available for this study. The selection criteria set by the researcher was first, the required banks are only Commercial banks in Ethiopia. Those commercial banks should operate before 2007/08 having auditing financial statements for consecutively ten years working experience in lending activity.

3.5 Data Collection

Quantitative data collection methods are entered on the quantification of relationships between variables. The current study used only secondary data. In this study the researcher used both bank specific and macroeconomics data for commercial banks that operated during the 2009 to 2018 period. The data set also includes macroeconomics variables such as the annual inflation (INF), Growth domestic products (GDP) and bank specific variables bank size (BS), loan to deposit ratio (LTD), profitability (ROA), and capital adequacy ratio (CAR).The bank specific data were obtaining from the audited financial statement of selected commercial Banks while the macroeconomics variables were obtaining from National Bank of Ethiopia and from MOFED. Besides, related books, journals, articles and various manuals also use as sources of Secondary data.

3.6 Model Specification and variables

The aim of this study was to examine the determinants of NPLs of commercial banks in Ethiopia. Similar to the most noticeable previous research works conducted on the non-

performing loans of financial sectors, this study used non-performing loans ratio as dependent variables whereas Loan to deposit ratio, capital adequacy ratio, profitability, bank size, inflation and Growth domestic product as explanatory (independent) variables. These variables were chosen since they are widely existent for the commercial banks in Ethiopia. Accordingly, this study examined the determinants of Non-performing loans (NPLs) of commercial banks in Ethiopia by adopting the ordinary Least squares (OLS) regression model which is to test the hypothesis and to realize the relationship between the dependent variable and independent variable. The general formula of multivariate regression equations is adopted:

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

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

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

$$\mathbf{NPL_{it} = \beta_0 + \beta_1(LTD)_{it} + \beta 2(CAR)_{it} + \beta 3(INF)_{it} + \beta_4(ROA)i_t + \beta_5(GDP)_{it} + \beta_6(BS)_{it} + \varepsilon_{it}}$$

Where;

B0 is an intercept

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6,$ and β_7 represent estimated coefficient for specific bank i at time t,

LDT, CAR, ROA, profitability, bank size, inflation and Economic growth. ε_{it} represents error terms for intentionally/unintentionally o BS, INF and GDP represent Loan to deposit ratio, capital adequacy ratio, mitted or added variables.

LDT: loan to deposit ratio, GDP: gross domestic product, ROA: return on assets, BS: bank size, CAR; capital adequacy ratio and INF: inflation.

3.7 Description of Study Variables and their expected sign

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

table3. 1Description of the Study Variables and their expected sign

Explanatory variables	Hypothesized impact on Nonperforming loan
Loan to deposit ratio	Positive & Sig
Return on asset	Negative & Sig
Capital adequacy ratio	Negative & Sig
Banks size	Negative & Sig
Gross Domestic Product	Positive & Sig
Inflation Rate	Negative & Sig

CHAPTER FOUR

4. DATA ANALAYSIS AND INTERPRTATION

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 descriptive statistics for dependent and independent variables are presented below. For both dependent and independent variables value of minimum, maximum, mean and standard deviation are presented. The dependent variable is non-performing loan and measured by impaired loan (bad loan) to total loan. The remaining are independent variables such as: from bank specific variables profitability, loan to deposit ratio, bank size, capital adequacy ratio and from macroeconomics variables gross domestic product and inflation rate. The summary of descriptive statistics that was intended to give general descriptions about the data (both dependent and independent variables) is presented in this Table. The total number of observation for variable was 100 (i.e., 10 years data (from 2009-2018) 10 commercial banks of Ethiopia. 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.

table4. 1 Summary of descriptive statistics for dependent and independent variables

Variables	NPLS	ROA	BS	CAR	LTD	INF	GDP
Mean	0.252631	0.044333	4.099657	0.182831	0.590859	0.325060	0.160560
Median	0.254300	0.033142	4.045653	0.126282	0.585894	0.057500	0.147000
Maximum	0.697600	0.360700	8.204571	0.821196	0.890000	3.085600	0.341000
Minimum	0.000000	-0.01931	2.506505	-0.01788	0.41153	-0.809	-0.09
Std. Dev.	0.137060	0.049598	0.722238	0.214411	0.090105	1.055917	0.120129
Observations	100	100	100	100	100	100	100

Source: Eviews 8 output 2021

This table shows that for the total sample, the mean of NPLs was 0.2526 with a minimum of 0.0000 and a maximum of 0.6976. This indicates that, from the total loans that Ethiopian commercial banks disbursed, an average of 0.2526 were being default or uncollected over the sample period. This ratio is above than both the Basel standard and National bank of Ethiopia‟s limit of NPLs ratio which is 5%. This indicates that there is not a good movement by ECBs towards minimizing NPLs in the sample years. The disparity between the minimum0.000 and the maximum 0.6976 of NPLs indicate the margin that NPLs ratio of Ethiopian commercial banks ranged over the sample period. The standard deviation (0.137) of NPLs shows the variation of NPLs among Ethiopian commercial banks. According to Brooks, (2008), a low standard deviation indicates that the data point tends to be very close to the mean, whereas high standard deviation indicates that the data point is spread out over a large range of values. Among the bank specific independent variables, from the total of 100 observations over the sample period of 2009 to 2018, ROA has a standard deviation of 0.04959 which indicates the existence of Low variation among Ethiopian commercial banks in terms of their profitability. The other bank specific variable bank size had a higher standard deviation which implies that banks are more expands theirs branch. On the other hand, among the macroeconomic variables employed in this study inflation rate (INF) had 0.32506 mean 0.0575 median - 0.809 minimum value and higher standard deviation which was 1.055. This implies that inflation rate in Ethiopia during the study period remains somewhat unstable. On the other hand, the mean of the growth domestic's products of Ethiopian commercial banks was 0.16056 with a standard deviation of 0.12. The standard deviation of ROA was the lowest of all the variables used in this study. This indicates that the ROA of Ethiopian commercial banks was Low stable over the sample period.

4.3 Correlation Analysis

table4. 2 Correlation matrix of dependent and independent variables Source

Variables	NPLS	ROA	BS	CAR	LTD	IFN	GDP
NPLs	1						
ROA	-0.07907	1					
BS	0.25790	0.086720	1				
CAR	-0.08345	-0.08952	-0.33719	1			
LTD	-0.00049	0.104305	-0.16527	0.284791	1		
INF	-0.15509	-0.14933	-0.10044	-0.00151	-0.11426	1	
GDP	0.012351	-0.19521	-0.16387	-0.01628	-0.02946	-0.08731	**1**

Source: Eviews 8 output 2021

The purpose of correlation matrix in this particular study was to show the linear association between the dependent and independent variables. As noted in Brooks (2008), correlation between two variables measures the degree of linear association between them. Values of the correlation coefficient are always range between positive one and negative one. To find the association of the independent variables with dependent variables Pearson Product Moment of Correlation Coefficient was used in this study. Correlation coefficient between two variables ranges from +1 (i.e. perfect positive relationship) to -1 (i.e. perfect negative relationship) and a correlation coefficient of zero, indicates that there is no linear relationship between the two variables. Table 4. 2: Correlation matrix of dependent and independent variables Source: From Eviews 8 output Table 4.3 above, shows the correlation coefficient between the dependent variables and independent variables. Among the bank specific variables capital adequacy ratio, growth domestic product, Variables NPLS ROA BS CAR LTD GDP INF NPLs, -0.07907, -0.15509, -0.08345,-0.0009, 0.012351,. Profitability and Loan to deposit ratio are negative correlated with Non-performing Loan with correlation coefficient of respectively. While bank size and inflation rates are positively and negatively correlated with Non-performing Loan with correlation coefficient of 0.25790 and -0.15509, respectively. Bank size has shown the least positive coefficient of 0.253301 and growth

domestic products have shown the latest positive coefficient of 0.012351 respectively with respect to Non-performing Loan. While inflation rates shows the lowest negative coefficient of -0.15509 and Loan to deposit ratio has shown the lowest negative coefficient of -0.00049 in relation with Non-performing Loan.

4.4 Test Results for CLRM Assumption

For the econometric estimation to bring robust, unbiased/reliable and consistent result, it has to fulfill the basic linear classical assumptions. The basic assumptions include: (i) linearity in parameters of the regression model, for a given explanatory variable the mean value and the variance of disturbance term (Ui) is zero and constant (homoscedastic), the covariance between the error terms over time is zero. In other words, it is assumed that the errors are uncorrelated with one another (Multicollinearity). And the stochastic (disturbance) term Ui is normally distributed. (Gujarati, 1995).

table4. 3Test for Heteroscedasticity Assumption

Heteroscedasticity Test: Harvey

F-statistic	0.898843	Prob. F(6,93)	0.4993
Obs*R-squared	5.481135	Prob. Chi-Square(6)	0.4837
Scaled explained SS	4.543553	Prob. Chi-Square(6)	0.6035

Source: Eviews 8 output 2021

In the classical linear regression model, one of the basic assumptions is Homoscedasticity assumption that states as the probability distribution of the disturbance term remains same for all observations. That is the variance of each u_i is the same for all values of the explanatory Variable. However, if the disturbance terms do not have the same variance, this condition of non-constant variance or non-homogeneity of variance is known as Heteroscedasticity (Bedru and Seid, 2005). Accordingly; in order to detect the Heteroscedasticity problems, White test was utilized in this study. This test states that if the p-value is significant at 95 confidence interval, the data has Heteroscedasticity problem, whereas if the value is insignificant (greater than 0.05), the data has no Heteroscedasticity problem. So, as shown in the above table, there is Heteroscedasticity problem for this study hence the p value is 48.37% showing insignificant value. There is no evidence for the presence of Heteroscedasticity, since the P-values are considerably in excess of 0.05. or 5%.

The third version of the test statistic, “Scaled explained SS”, as the name suggests it is based on a normalized version of the explained sum of squares from the auxiliary regression, also give the same conclusion. Generally, in all of the regression models used in this study it was proved that the variance of the error term is constant or homoscedastic and the researcher had sufficient evidence to reject the null hypothesis of heteroscedasticity.

4.56Test for absence of autocorrelation assumption

According to (Brooks, 2008) the figure shows as Durbin-Watson has 2 critical values: an upper critical value (dU=1.67) and a lower critical value (dL=1.421).

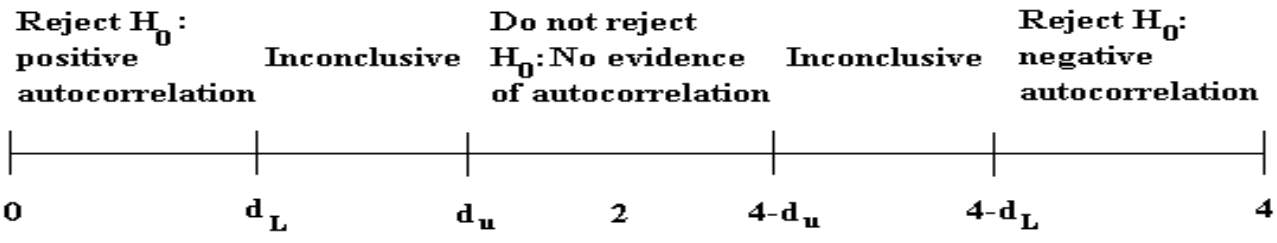
The values of 4 - dU = 4-1.670=2.33 and 4-Dl=4-1421=2.579 According to Durbin-Waston test (DW) in the region between dU and 4-dU no evidence of autocorrelation.

According to Brooks (2008) the null hypothesis is rejected and the existence of positive autocorrelation presumed if DW is less than the lower critical value; the null hypothesis is rejected and the existence of negative autocorrelation presumed if DW is greater than 4 minus the lower critical value (dL); the null hypothesis is not rejected and no significant residual autocorrelation is presumed if DW is between the upper(dU) and 4 minus the upper limits.

Hence the values of 4 - dU = 4-1.67=2.33.

As shown in table 4.5, the Durbin-Watson test statistic of this study=1.98 which is between dU=1.670 and 4-dU=2.22 was clearly between the upper limit (1.780) and 4-dU=2.22 and so null hypothesis not rejected. That means no evidence of autocorrelation.

figure4. 1Rejection and non-rejection regions for DW test



Source: book (2008) 2021

4.7 Test for error term assumption is zero

The first assumption required is that the average value of the errors term is zero (E (ut) = 0). In fact, if a constant term is included in the regression equation, this assumption will never be violated (Brooks, 2008). Therefore, since the constant term (i.e. α) was included in the regression equation, the average value of the error term in this study is expected to bezero.

4.8 Test for normality assumption

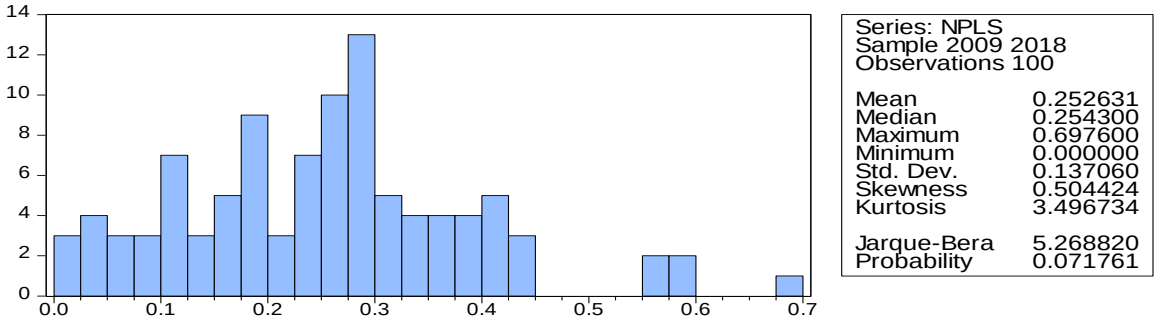
Normality is a condition in which the variables to be used in the model follow the standard normal distribution. The Jarque-Bera statistics was used to test the normality of the variable under different conditions and under the hypotheses; Normality assumption (ut~N (0, σ2) statethat a normal distribution is; to have a coefficient of kurtosis approach to 3. Bera-Jarque formalizes this by testing the residuals for normality and testing whether the coefficient of skeweness near to 0 (zero) and the kurtosis approach to 3. The Bera-Jarque probability statistics/P-value is also expected to be greater than 0.05. Or greater than **5%.**

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:

figure4. 2Test for normality assumption



Source: Eviews 8 output 2021

As the result shows the J-B probability is greater than 0.05 (i.e. 0.0717). Based on this result the null hypothesis is accepted and the data is normally distributed.

4.9 Test for Multicollinearity assumption

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.so, there is not a serious Multicollinearity problem under this study.

table4. 4Test for Multicollinearity assumption

Variables	**NPLS**	**ROA**	**BS**	**CAR**	**LTD**	**IFN**	**GDP**
NPLs	1						
ROA	-0.07907	1					
BS	0.25790	0.086720	1				
CAR	-0.08345	-0.08952	-0.33719	1			
LTD	-0.00049	0.104305	-0.16527	0.284791	1		
INF	-0.15509	-0.14933	-0.10044	-0.00151	-0.11426	1	
GDP	0.012351	-0.19521	-0.16387	-0.01628	-0.02946	-0.08731	**1**

Source: Eviews 8 output 2021

4.10 Model Specification assumption

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 tend 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.

$\alpha = 0.05$

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	12.938138	6	0.0440

Source: Eviews 8 output 2021

Decision Rule: Reject H0 if P value is less than significant level 0.05. Otherwise, do not reject H0. 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 Fixed Effects-Hausman Test. The Hausman test that examines whether the unobservable heterogeneity term is correlated with explanatory variables, while continuing to assume that repressors are uncorrelated with the disturbance term in each period. The null hypothesis for this test is that unobservable heterogeneity term is not correlated or fixed effect model is appropriate, with the independent variables. The pooled regression assumes that the intercepts are the same for each firm. This

may be an inappropriate assumption; the simplest types of fixed effects models allow the intercept in the regression model to differ cross-section ally.

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

4.10.1 Model selection

4.10.1.1 Random effect versus fixed effect models

According to Gujarati (2004), if T (the number of time series data) is large and N (the number of cross-sectional units) is small, there is likely to be little difference in the values of the parameters estimated by fixed effect model/FEM and random effect model/REM. Hence the choice here is based on computational convenience. On this score, FEM may be preferable. Since the number of time series (i.e. 10 year) is greater than the number of cross-sectional units (i.e. 10 commercial banks), FEM is preferable in this case. According to Brooks (2008); Verbeek (2004) and Wooldridge (2004), it is often said that the REM is more appropriate when the entities in the sample can be thought of as having been randomly selected from the population, but a FEM is more plausible when the entities in the sample effectively constitute the entire population/sample frame. Hence, the sample for this study was not selected randomly and equals to the sample frame FEM is appropriate.

4.10.2 Discussion of Regression Results

This section discusses in detail the analysis of the results for each explanatory variable and their importance in determining NPLs in Ethiopian commercial banks. The model developed for this study was: $NPLs = \beta o + \beta 1(ROA)_{it} + \beta 2(BS)_{it} + \beta 3(CAR)_{it} + \beta 4(LTD)_{it} + \beta 5(GDP)_{it} + \beta 6(INF)$. The regression result for this model is as follow.

table4. 5The regression results from Eviews 8 software

Dependent Variable: NPLS

Method: Panel Least Squares

Date: 01/03/21 Time: 03:33

Sample: 2009 2018

Periods included: 10

Cross-sections included: 10

Total panel (balanced) observations: 100

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.307172	0.107907	-2.846628	0.0056
BS	0.172401	0.015348	11.23254	0.0000
CAR	-1.285061	0.392422	-3.274689	0.0015
GDP	0.146098	0.053275	2.742332	0.0075
INF	-0.006682	0.006054	-1.103625	0.2729
LTD	0.143098	0.084516	1.693161	0.0941
ROA	-0.403058	0.149636	-2.693591	0.0085

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.839969	Mean dependent var	0.252631
Adjusted R-squared	0.811392	S.D. dependent var	0.137060
S.E. of regression	0.059524	Akaike info criterion	-2.659231
Sum squared resid	0.297620	Schwarz criterion	-2.242404
Log likelihood	148.9615	Hannan-Quinn criter.	-2.490533
F-statistic	29.39320	Durbin-Watson stat	1.665248
Prob(F-statistic)	0.000000		

Source: Eviews 8 output 2021

The estimation results reported above depicted that, The R-squared and Adjusted R-squared values of 0.839969 and 0.811392 respectively is an indication that the model is a good fit.

This means more than 83.99% of variations in NPLs of Ethiopian commercial banks were explained by independent variables included in the model. However, the remaining 16.01% changes in NPLs of Ethiopian commercial banks are caused by other factors that are not included in the model. Furthermore, the F-statistic was 29.39320 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 Prob(F statistic) 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.

4.2.3 Return on Asset (ROA) and Non-Performing Loans (NPLs)

The regression result of fixed effect model in the above table is consistent with the hypothesis developed by the researcher. The study hypothesized that there is a negative association between ROA and NPLs of banks. The hypothesis, the estimated coefficients and test statistics of ROA was -0.4030 and -2.6935 respectively. This reveals negative and statistically insignificant impact of ROA on the levels of NPLs. and implies that for one unit change in bank profitability measured in terms of ROA, had resulted -0.4030 unit change on the level of NPLs in the same direction. Unlike the study made by Boudriga *et al*.(2009) and Makri *et al.*(2014) where aggregate country data was used, and Selma and Jouini(2013) where particular country data was used, the results of this study confirms the finding of Swamy(2012) and, Ahmad and Bashir(2013)where single country data was considered. Thus, results of this study examined negative insignificant effect of bank profitability measured in terms of ROA on the levels of NPLs of commercial banks in Ethiopia. The main reason for this negative impact of ROA on the levels of NPLs resulted from bank management's inefficiency on asset utilization and also poor loan quality in the Ethiopia. Thus, the finding implies that commercial banks in Ethiopia are less incentive for return gained from assets and also to provide loans.

4.2.4 Capital Adequacy Ratio (CAR) and Non-Performing Loans (NPLs

Regarding capital adequacy ratio that determines the risk taking behavior of banks, this study identifies statistically significant and positive impact of capital adequacy ratio on NPLs. Thus, regression result of fixed effect model in the above table is consistent with the hypothesis developed in this study. The study hypothesized that there is a positive association between CAR and NPLs of banks. This positive sign indicates a direct relationship between capital adequacy ratio and NPLs. Thus, it implies that for one unit change in the bank's

capital adequacy ratio, keeping other thing constant had resulted -0.1850 unit changes on the levels of NPLs in the same direction. The result of this finding is consistent with the study of Hyun and Zhang (2012) where particular country data was used and Makri *et al.* (2014) where aggregate country data was used. Unlike the study made by Boudriga *et al. (*2009), and Djiogap and Ngomsi (2012) where aggregate country data was used and, Shingjerji (2013) and Swamy (2012) where particular country data was used, the result of this finding confirms significant negative effect of CAR on the levels of NPLs of commercial banks in Ethiopia by supporting the arguments that state well capitalized banks are better able to resist the levels of risk. This implies commercial banks in Ethiopia are less the incentives to take riskier loan activities due to highly regulated nature of the institution in the country. Thus, negative impact of CAR on NPLs is due to effective regulatory pressures by NBE on capital adequacy ratio of banks and also bank management's efficient utilization of its capital to absorb NPLs.

4.2.5 Loan to Deposit ratio (LTD) and Non-Performing Loans (NPLs)

It examines bank liquidity by measuring the fund that a bank has utilized in to loan from collected deposit. The coefficient sign of loan to deposit ratio shows that there is a positive relationship between banks non-performing loans and loan to deposit ratio. Loan to deposit ratio had positive Coefficient value (0.1430987) and statistically significant (p-value = 0.09) at 5% significant level. The result is in line with the research hypothesis which is based on the argument that when banks' lending increase as compared to the deposits the levels of NPLs also increase. Because at the time of low loans to deposits ratio in order to earn more banks start lending even to the low quality borrowers and do not follow the standard loan allocation practices, which leads to the growth in NPLs. Therefore, the result implies that every one percent change (increase or decrease) in bank's loan to deposit ratio keeping the other thing constant has a resultant change of 12.2% on the non-performing loan in the same direction. The result is show there is a positive relationship between loan to deposit ratio and Non-performing loans. Therefore; - Loan to deposit ratio had positive and statistically significant relationship between banks non-performing loans and loan to deposit ratio.On Ethiopian commercial banks.

4.2.6 Growth domestic's products (GDP) and Non-Performing Loans (NPLs)

The coefficient signs of real GDP growth rate show that, economic growth has a positive impact on the growth of NPLs. Unexpectedly the current econometric analysis suggest that

real GDP growth is not the main driver of non-performing loan ratio in Ethiopia banking industry. The result also suggests that GDP growth rate is not the most important determinant factor for Ethiopia commercial banks NPLs.So, (i.e. there is positive and insignificant relationship between GDP and banks non-performing loan). Opposite to the current coefficient sign of GDP, Quagliarello (2007) found that business cycle affects the NPLs ratio for a large panel of Italian banks over the period 1985 to 2002. Furthermore, Salas and Saurian (2002) estimated a significant negative contemporaneous effect of GDP growth on the NPLs ratio and inferred the quick transmission of macroeconomic developments on the ability of economic agents to service theirloans. Growth domestic's products (GDP) have a positive and significant relationship between GDP and banks non-performing loan). The coefficient signs of real GDP growth rate show that 0.146098 and also the research hypothesis was positive relationship between Growths domestic are products (GDP) and Non-performing loans in commercial banks of Ethiopia.

4.2.7 Inflation Rate (INF) and Non-Performing Loans (NPLs)

Theories argue that inflation rate and non-performing loan have Negative relationship. Since market frictions lead to the rationing of credit, credit rationing becomes more severe as inflation rises. As a result, the financial sector makes fewer loans, resource allocation is less efficient, and intermediary activity diminishes with adverse implications forcapital/longterm investment. Though the magnitude of the coefficient of correlation between inflation and non-performing loans is low, the sign is positive (-.00723); unexpected rise in inflation under cyclical downturns is likely to negatively affect the performance of the banking sector and recovery of loans to private operators and investors. In the extreme case, hyper-inflation may erode banks assets and equity and weaken banks position through the interest rate channel (Piloiu.A et. al.2013). Therefore, even if the finding is insignificant (-0.006682) the result disclosed that inflation rate has negative relationship with non-performing loan. So, Inflation rate is not important determinants of NPLs in Ethiopia commercial banks.

4.2.8 Banks Size (BS) and Non-Performing Loan (NPLs)

The result of this study found that bank size had a Negative and statistically significant impact on Non-performing loans of Ethiopian commercial banks. The regression result of the model indicates that banks size had positive and statistically significant impact on non-performing loans which is the same to the hypothesis of banks size has negative and

significant impact on non-performing loans of commercial bank. This positive sign of the coefficient indicates a direct relationship between bank size and non-performing loan and the results of the study supports the above "too big to accept theories. The result of the study reveals that, being other variables constant, a one unit change on bank size had resulted in a 0.172401 units change on non-performing loans of Ethiopian commercial bank in the same direction. In generally, the result reveals that banks non-performing loan decreases with the size of the banks size measured by natural logarithm of total asset in which small sized banks may hold a buffer of liquid asset. Thus, the hypothesis: banks size has positive and significant impact on banks size was accepted. The descriptive statistics for dependent and independent variables are presented below. For both dependent and independent variables value of minimum, maximum, mean and standard deviation are presented. The dependent variable is non-performing loan and measured by impaired loan (bad loan) to total loan. The remaining are independent variables such as: profitability, capital adequacy ratio, loan to deposit ratio, bank size, gross domestic product and inflation rate.

table4. 6 Summary of actual and expected signs of explanatory variables on the dependent Variables.

Explanatory variables	Hypothesized impact on Nonperforming loan	Actual impacts
Loan to deposit ratio	Positive & Sig	Positive & Sig
Return on asset	Negative & Sig	Negative & Sig
Capital adequacy ratio	Negative & Sig	Negative & Sig
Banks size	Negative & Sig	Positive & Sig
Gross Domestic Product	Positive & Sig	Positive & Sig
Inflation Rate	Negative & Sig	Negative & Sig

CHAPTER FIVE

5. CONCLUSION ANDRECOMMENDATION

5.1 INTRODUCTION

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. The preceding chapter presented results and discussion of the study, while this chapter was deals with conclusion and recommendation of the study based on the findings. Accordingly, this chapter is organized into different sub-sections. Conclusion of the study, recommendation of the study and provide research limitations and future research directions.

5.2 Conclusion

Non-performing loan can affect the ability of banks to play their role in economic development. The fast increase in NPLs not only increased banks' vulnerability to further shocks but also limited their lending operations with broader repercussions for economic activity. The current study attempted to a certain determinant of NPLs. As well as to investigate and verify the effectiveness of common determinants of commercial banks non-performing loan and how they affect the level of NPLs in Ethiopia commercial banks. Six variables (four bank specific and tow macro-economic determinants/variables) affecting the commercial banks NPLs. were chosen and analyzed. The panel data was used for the sample of nine commercial banks in Ethiopia from 2009 to 2018. Data was presented by using descriptive statistics. The balanced correlation and regression analysis for non-performing loans was conducted. The model was tested for the multiples linear regression model assumptions. The model fulfills assumptions of the LRM. Fixed effect model/FEM was used based on convenience. Six factors affecting banks' loan and advance were chosen and analyzed. From the list of possible explanatory variables, only four of them proved to be statistically significant. The results of models enable us to make following conclusions. With respect to the bank specific variables, the study find that from four bank specific variables three of them (Capital adequacy ratio, GDP and loan to deposit ratio) were statistically significant and important factors that affect the level of NPL in Ethiopia commercial banks. From macroeconomic variable the study also find evidence for a significant and negative relationship between inflation rate and non-performing loans. From mentioned variables inflation rate have a very strong impact on NPLs. Result also shows that the impact of inflation rate on NPLs is instantaneous. The empirical results, however, reveals that GDP and

inflation rate are important determinants of NPL, they were not an important determinants of NPLs in Ethiopia commercial banks. Generally; 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 growth domestic product and inflation rate and also inflation is found to be the most significant Variable which explains the variation of NPLs in ECBs. This is because the country's economy is more fluctuated. Loan to deposit 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 ROA and Inflation Rate are founded to be insignificant in explaining the variation of NPLs of ECBs.

5.3 Recommendations

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

- Ethiopian commercial banks should be considering the performance of the real economy when extending loans.
- The government should be reducing the strains to the general economy in order 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 of NPLs.
- The result of this study more specifically indicates that the government should come up with strategies aimed at reducing the impact of inflation rate, growth domestic products in commercial banks of Ethiopia.
- 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, the future researcher should incorporate external factors such as regulatory environment (loan loss provisions), money supply, unemployment rate and corporate governance.

- ❖ It is also recommended for future researchers to study the determinants of NPLs in different economic sectors.

5.3. Research limitations and future research directions

This research tried to meet the gap between the existing literatures (that are mentioned in chapter one and two), but it also has its own imitations and those limitations can be addressed by other researchers in the future. Accordingly, the study employed only a secondary data (banks audited financial statements) and used static panel data model and limited to the sample of only nine commercial banks. Even if there are so many bank specific and macroeconomic variable the researcher only saw four bank specific variables (capital ardency ratio, profitability, loan to deposit ratio and bank size) and two macroeconomic variables(Growth domestic product and inflation rate). Hence, there are other variables other than the above ones that can determine banks non-performing loan i.e. from bank specific; return on equity (ROE), Credit growth and total liabilities to income etc. From macroeconomic factors such as real exchange rate and unemployment. Therefore, the future researches should investigate by increasing the number of samples and by including new determinants of Non-performing loans (NPLs). And also using other advanced techniques such as fully Modified OLS Model. And use both qualitative and quantitative research approach.

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Appendix

Appendix; 1Raw Data

BANKS	YEAR	NPLs	ROA	BS	CAR	LTD	GDP	INF
AIB	2009	0.2901	0.0314	3.8077	0.1168	0.5467	0.256	0.2719
AIB	2010	0.1789	0.0442	3.9001	0.1184	0.5152	0.341	1.573
AIB	2011	0.1510	0.0499	4.0050	0.1293	0.5148	0.191	0.003
AIB	2012	0.1934	0.0445	4.0769	0.1349	0.5980	-0.093	0.106
AIB	2013	0.2983	0.0439	4.1720	0.1354	0.6146	0.05	3.0856
AIB	2014	0.3159	0.0414	4.3017	0.1261	0.6101	0.329	0.109
AIB	2015	0.3546	0.0361	4.3778	0.1295	0.6740	0.087	0.073
AIB	2016	0.4121	0.0333	4.4714	0.1289	0.6767	0.147	0.106
AIB	2017	0.4213	0.0280	4.6230	0.1111	0.7380	0.147	0.3662
AIB	2018	0.4132	0.0477	4.7425	0.0881	0.7146	0.113	0.158
BOA	2009	0.2295	0.0266	3.7385	0.0948	0.6028	0.256	0.2719
BOA	2010	0.2112	0.0312	3.7979	0.0932	0.6136	0.341	1.573
BOA	2011	0.1900	0.0354	3.8620	0.0908	0.5458	0.191	0.003
BOA	2012	0.2363	0.0351	3.9159	0.1100	0.5756	-0.093	0.106
BOA	2013	0.2363	0.0284	4.0056	0.1093	0.5534	0.051	3.0856
BOA	2014	0.2243	0.0465	4.0522	0.1356	0.5564	0.329	0.109
BOA	2015	0.1945	0.0275	4.1357	0.1325	0.5311	0.087	0.073
BOA	2016	0.1943	0.0278	4.2260	0.1262	0.5876	0.147	0.061
BOA	2017	0.2321	0.0260	4.4035	0.1147	0.6728	0.147	0.3662

BOA	2018	0.2763	0.0345	4.5049	0.1327	0.6975	0.113	0.028
CBE	2009	0.4321	0.0323	4.7739	0.0848	0.4807	0.256	0.2719
CBE	2010	0.3876	0.0265	4.8703	0.0749	0.4395	0.341	1.573
CBE	2011	0.3954	0.0251	5.0579	0.0548	0.4243	0.191	0.181
CBE	2012	0.3765	0.0342	5.2009	0.0486	0.5345	-0.093	0.054
CBE	2013	0.4215	0.0310	5.2947	0.0459	0.4695	0.051	3.0856
CBE	2014	0.5623	0.0278	5.3809	0.0446	0.4538	0.329	-0.274
CBE	2015	0.6976	0.0835	8.2046	0.0806	0.5972	0.087	-0.666
CBE	2016	0.5764	0.0216	5.5842	0.0386	0.4778	0.147	-0.083
CBE	2017	0.5823	0.0178	5.6903	0.0909	0.4115	0.147	0.3662
CBE	2018	0.5721	0.0123	6.0000	0.0647	0.4461	0.113	-0.282
CBO	2009	0.0452	0.0028	2.6274	0.8143	0.8630	0.256	0.2719
CBO	2010	0.1021	0.0180	2.8312	0.8212	0.6580	0.341	1.573
CBO	2011	0.1012	0.0221	3.0099	0.8077	0.7560	0.191	-0.809
CBO	2012	0.0391	0.0331	3.2475	0.8028	0.5260	-0.093	-0.041
CBO	2013	0.1637	0.0401	3.3981	0.8027	0.4120	0.051	3.0856
CBO	2014	0.3615	0.0494	3.5648	0.8051	0.4900	0.329	-0.274
CBO	2015	0.3345	0.0332	3.8155	0.8001	0.4700	0.087	-0.666
CBO	2016	0.3467	0.0032	3.8664	0.7964	0.6700	0.147	-0.083
CBO	2017	0.4363	0.0181	4.0593	0.8024	0.8900	0.147	0.3662
CBO	2018	0.4210	0.0184	4.0264	0.7922	0.7100	0.113	-0.282
DB	2009	0.1365	0.0362	3.9882	0.0934	0.5617	0.256	0.2719

DB	2010	0.1425	0.0371	4.0918	0.0909	0.4977	0.341	1.573
DB	2011	0.1706	0.0430	4.1661	0.0953	0.5251	0.191	-0.809
DB	2012	0.1945	0.0510	4.2435	0.1043	0.5776	-0.093	-0.041
DB	2013	0.1777	0.0412	4.2955	0.1036	0.5591	0.051	3.0856
DB	2014	0.2453	0.0436	4.3417	0.1183	0.5333	0.329	-0.274
DB	2015	0.2574	0.0389	4.3938	0.1181	0.5818	0.087	-0.666
DB	2016	0.2910	0.0333	4.4560	0.1175	0.5578	0.147	-0.083
DB	2017	0.2643	0.0239	4.5394	0.1153	0.6509	0.147	0.3662
DB	2018	0.2981	0.0299	4.6573	0.1291	0.6471	0.113	-0.282
LIB	2009	0.0279	0.0398	2.9788	0.2013	0.6682	0.256	0.2719
LIB	2010	0.0457	0.0345	3.1347	0.1773	0.5739	0.341	0.573
LIB	2011	0.0032	0.0276	3.2572	0.1952	0.5213	0.051	3.0856
LIB	2012	0.0653	0.0351	3.3915	0.1793	0.5589	0.329	-0.274
LIB	2013	0.0742	0.0412	3.4687	0.1842	0.6259	0.087	-0.666
LIB	2014	0.0823	0.0295	3.5579	0.1738	0.5736	0.147	-0.083
LIB	2015	0.2873	0.0318	3.7678	0.1403	0.6350	0.147	0.3662
LIB	2016	0.2762	0.0206	3.9095	0.1318	0.6795	0.113	-0.282
LIB	2017	0.2628	0.0281	4.0404	0.1320	0.6252	0.113	-0.282
LIB	2018	0.3621	0.0387	4.1559	0.1263	0.6335	0.191	-0.809
NIB	2009	0.2339	0.0459	3.6818	0.1516	0.6736	0.256	0.2719
NIB	2010	0.2213	0.0389	3.7760	0.1535	0.6169	0.341	0.573
NIB	2011	0.1534	0.0412	3.8520	0.1646	0.5364	0.191	-0.809

NIB	2012	0.1784	0.0272	3.9178	0.1846	0.6353	-0.093	-0.041
NIB	2013	0.1976	0.0251	3.9612	0.1822	0.6826	0.051	3.0856
NIB	2014	0.2754	0.0795	4.0313	0.1828	0.6825	0.329	-0.274
NIB	2015	0.2643	0.0795	4.1224	0.1642	0.7053	0.087	-0.666
NIB	2016	0.2853	0.0775	4.1995	0.1591	0.6047	0.147	-0.083
NIB	2017	0.3134	0.0370	4.3226	0.1405	0.6525	0.147	0.3662
OIB	2018	0.3213	0.0467	4.4263	0.1267	0.6244	0.113	-0.282
OIB	2009	0.0019	-0.0193	2.5065	-0.0179	0.6141	0.256	0.2719
OIB	2010	0.0000	0.0267	3.0487	0.0107	0.4495	0.341	0.573
OIB	2011	0.1112	0.0289	3.2927	0.0089	0.4336	0.051	-0.809
OIB	2012	0.1101	0.0209	3.4452	0.0048	0.4816	0.329	-0.041
OIB	2013	0.1052	0.0200	3.5923	0.0035	0.5315	0.087	3.0856
OIB	2014	0.0996	0.0306	3.7890	0.0039	0.5059	0.147	-0.274
OIB	2015	0.2695	0.0275	3.9793	0.0026	0.6456	0.147	-0.666
OIB	2016	0.3175	0.0213	4.0524	0.0017	0.5526	0.113	-0.083
OIB	2017	0.3421	0.0209	4.2120	0.0012	0.5349	0.147	0.3662
OIB	2018	0.2972	0.0191	4.3012	0.0014	0.5438	0.113	-0.282
UB	2009	0.1670	0.0446	3.6676	0.1118	0.5952	0.256	0.2719
UB	2010	0.2887	0.0331	3.7706	0.1081	0.5532	0.341	0.573
UB	2011	0.2545	0.0340	3.8879	0.1167	0.5402	0.191	-0.809
UB	2012	0.0567	0.3607	3.9438	0.1254	0.6046	-0.093	-0.041
UB	2013	0.1256	0.0228	3.9990	0.1204	0.5842	0.05	3.0856

UB	2014	0.2535	0.0181	4.0747	0.1326	0.5693	0.329	-0.274
UB	2015	0.1083	0.2144	4.1572	0.1174	0.5811	0.087	-0.666
UB	2016	0.2711	0.2143	4.2373	0.1200	0.6546	0.147	-0.083
UB	2017	0.3421	0.1948	4.3405	0.1149	0.7268	0.147	0.3662
UB	2018	0.3657	0.0276	4.4476	0.1054	0.6443	0.113	-0.282
WB	2009	0.1231	0.0611	3.7091	0.1634	0.5666	0.191	0.2719
WB	2010	0.0853	0.0396	3.7591	0.1832	0.6306	-0.093	0.573
WB	2011	0.2521	0.0454	3.9064	0.1659	0.4885	0.051	-0.809
WB	2012	0.3213	0.0243	3.9215	0.1922	0.6192	0.329	-0.041
WB	2013	0.2894	0.0224	4.0168	0.1761	0.6212	0.087	3.0856
WB	2014	0.2431	0.0167	4.0509	0.1907	0.5492	0.147	-0.274
WB	2015	0.2755	0.1910	4.1371	0.1761	0.6151	0.147	-0.666
WB	2016	0.2541	0.1366	4.2092	0.1733	0.6775	0.113	-0.083
WB	2017	0.4264	0.0264	4.3212	0.1602	0.7301	0.256	0.3662
WB	2018	0.3876	0.0357	4.4376	0.1397	0.7210	0.341	-0.282

Source: NBE and CSA via simple excel

Appendix 2

Dependent Variable: NPLS

Method: Panel Least Squares

Date: 01/03/21 Time: 10:27

Sample: 2009 2018

Periods included: 10

Cross-sections included: 10

Total panel (balanced) observations: 100

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROA	-0.403058	0.149636	-2.693591	0.0085
LTD	0.143098	0.084516	1.693161	0.0941
INF	-0.006682	0.006054	-1.103625	0.2729
GDP	0.146098	0.053275	2.742332	0.0075
CAR	-1.285061	0.392422	-3.274689	0.0015
C	-0.307172	0.107907	-2.846628	0.0056
BS	0.172401	0.015348	11.23254	0.0000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.839969	Mean dependent var	0.252631
Adjusted R-squared	0.811392	S.D. dependent var	0.137060
S.E. of regression	0.059524	Akaike info criterion	-2.659231
Sum squared resid	0.297620	Schwarz criterion	-2.242404
Log likelihood	148.9615	Hannan-Quinn criter.	-2.490533
F-statistic	29.39320	Durbin-Watson stat	1.665248
Prob(F-statistic)	0.000000		

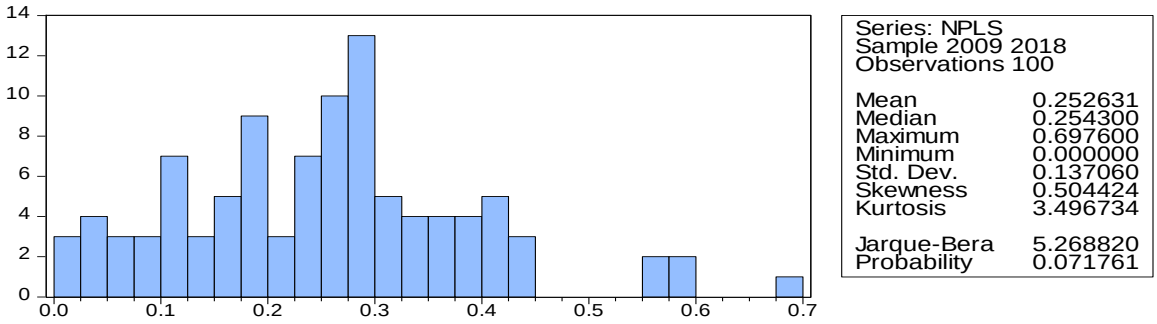
Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	12.938138	6	0.0440

SOURCE; - Eviews 8 2021



Source: Eviews 8 output 2021

Heteroscedasticity Test: Harvey

F-statistic	0.898843	Prob. F(6,93)	0.4993
Obs*R-squared	5.481135	Prob. Chi-Square(6)	0.4837
Scaled explained SS	4.543553	Prob. Chi-Square(6)	0.6035

Source: Eviews 8 output 2021