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**THE EFFECT OF NON PERFORMING LOAN ON  
PROFITABILITY OF ETHIOPIAN PRIVATE  
COMMERCIAL BANKS**

**BY**

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**(MSC IN ACCOUNTING AND FINANCE)**

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**THE EFFECT OF NON PERFORMING LOAN ON  
PROFITABILITY OF ETHIOPIAN PRIVATE  
COMMERCIAL BANKS**

**A THESIS SUBMITTED TO ADDIS ABABA UNIVERSITY COLLEGE OF  
BUSINESS AND ECONOMICS DEPARTMENT OF ACCOUNTING AND FINANCE  
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR DEGREE OF  
MASTERS OF SCIENCE IN ACCOUNTING AND FINANCE.**

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## **Declaration**

I, Fitsum Tadesse, hereby declare that the thesis work entitled “ The effect of NPL on profitability of Ethiopian Private Banks” submitted by me for the award of the degree of Masters of Science in Accounting and Finance of Addis Ababa University at Addis, Ethiopia, is my original work and it has never been presented in any university. All sources and materials used for this thesis have been duly acknowledged.

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## **Certification**

**Addis Ababa University**

**School of graduate studies**

This is to certify that the thesis prepared by Fitsum Tadesse entitles: *The effect of NPL on profitability of Ethiopian Private Banks* and submitted in partial fulfillment of the requirements for the degree of masters of Science in accounting and finance compiles with the regulations of the university and meets the accepted standards with respect to originality and quality.

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*Chair of Department or Graduate Program Coordinator*

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## **List of acronyms and abbreviations**

BZ	Bank's size
CAMEL	(Capital Adequacy, Asset Quality, Management Efficiency, Earnings Ability and Liquidity)
CAR	Capital Adequacy Ratio
CIR	Cost income ratio
CLRM	Classical Linear Regression Model
DUM120	Dummy Variable for Dashen Bank S.C on 2020
DUM303	Dummy Variable for Wegagen Bank S.C on 2003
DUM306	Dummy Variable for Wegagen Bank S.C on 2006
DUM508	Dummy Variable for NIB International Bank S.C on 2008
DW	Durbin–Watson
IMF	International Monetary Fund
LR	Liquidity ratio
LRR	Loan recovery rate
LTA	Loan to asset ratio
NIM	Net Interest margin
NPL	Nonperforming loan ratio
OLS	Ordinary Least Square
ROA	Return On Asset
ROE	Return On Equity

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## **Abstract**

*NPL has been considered to be an important issue on the profitability of banks. This study empirically to examine the effect of NPL on profitability of Ethiopian private commercial banks.*

*The study used balanced panel model in examining the regression model and collect data from six private banks covering the period of twenty one (21) consecutive years, 2000-2020. To this end, the study employed a quantitative research approach by combining documentary analysis. The study used panel data techniques specifically fixed effect model on the regression analysis and used E-view8 software. The study used one dependent variable return on asset (ROA), five independent variables that are NPL ratio, cost income ratio, loan recovery rate, bank size and loan to deposit ratio. The regression result show that NPL ratio has negative and significant impact on profitability and loan recovery rate and bank size have also positive and significant impact on profitability. However, cost income ratio and loan to deposit ratio have negative and insignificant impact on profitability. The research concluded that NPL has significant effect on the profitability of Ethiopian private banks. Hence, the study recommend in support of each variables for Ethiopian private banks to give due attention on NPL to enhance their profitability significantly.*

***Key words: - Private Banks, NPL and Profitability***

# CHAPTER ONE

## INTRODUCTION

### 1.1 Background of the study

Non-performing Loans (NPLs) are loans whose payment of interest and principal are pass due by 90 days or more or at least 90 days of interest payment have been capitalized, refinanced or delayed by agreement, or payments are less than 90 days overdue. There are other good reasons to doubt that payment will be made in full (IMF, 2009). Hennie and Sonja (2009) define NPLs as assets not generating income or when principal or interest is due and left unpaid for 90 days or more. Loan defaults are inevitable in any commercial bank but they can be minimized. According to Wondemagen (2012), non-performing loans continues to be an issue of major supervisory concern in Ethiopia. Non- performing loans are also described as loans in arrears for at least ninety days (Guy, 2011).

Among the two major sources of banking risk are credit risk and market risk. Credit risk can be explained as the risk that loan will not be repaid by the borrower while the market risk arises from adverse movements in market prices. In order for the bank and other financial institution to gain profit, they have to ensure the loans will be paid back in full by the borrowers to keep low credit risk. Credit risk can be categorized into two groups. It is the risk that the other party will default and the risks related to default incur after the recovery rate. In banking industry, non-performing loans are used as a measurement tools in order to identify credit risk faced by them (Mishkin and Eakins, 2003).

Credit risk remains as the essential and challenging corporate function as it will affect the profitability and the sustainability of banking industry. The two concerns of the credit risk or the non-performing loans are (1) macroeconomic factors and (2) bank specific factors. According to the capital market theory credit risk has both an idiosyncratic and a systematic component (Louberge and Schlesinger, 2002).

NPLs are important because they affect the financial intermediation role of commercial banks which constitutes the banks' main source of their income, and ultimately, the financial stability of an economy (Klein, 2013). For this reason, NPLs have increasingly attracted attention recognizing that a consequence of large amount of NPLs in the banking system is bank failure as well as a symptom of economic slowdown (Lata, 2014). This is largely because the financial performance of any commercial bank is measured in terms of profitability and NPLs have a direct adverse impact on the bottom line due to the provisions which the banks are forced to make on account of the NPLs (Balasubramaniam, 2013).

According to Khemraj and Pasha (2012) explain that high percentages NPLs are often associated with performance problems of banks and financial crises in both developing and developed countries. As stated by Fofack (2005) associates the occurrence of banking crises with a massive accumulation of NPLs and further observes that the NPLs account for a significant portion of total assets of insolvent banks and financial institutions.

Financial Performance in broader sense refers to the degree to which financial objectives being or has been accomplished and is an important aspect of finance risk management. It is the process of measuring the results of a firm's policies and operations in monetary terms. It is used to measure firm's overall financial health over a given period of time and can also be used to compare similar firms across the same industry or to compare industries or sectors in aggregation (Vogiazas & Nikolaidou, 2011).

According to Waweru and Kalani (2009), crises do not occur without warning; the best warning signs of financial crises are proxies for the vulnerability of the banking and corporate sector. The most obvious indicators in the view that can be used to predict banking crises are those that relate directly to the soundness of the banking system. The effect of default, non-performing loans, is not limited to that of affecting the profit of one particular bank but it has a ripple effect that extends itself into the economy at large. Hence, prudent banks are concerned about the quality of their loan and the effectiveness of their risk management processes in order to safeguarding their business as well as the overall economy.

NPL of Ethiopian private commercial banks' are still high as compared to the developing economy banks like, Namibia, Mozambique and Uganda (Fofack, 2005). Hence, Ethiopian private commercial banks are still expected to reduce their NPLs as low as possible in order to achieve their optimal profit and ultimately improve the soundness of the financial system. Thus, the major concern of this study is to examine the effect of NPL on profitability of Ethiopian private commercial banks.

## **1.2 Statement of the problem**

The NPLs negates the profitability of the rural banks. Nonperforming loans are not only argued to harmfully affect the financial performance of rural banks, but they also have other far reaching repercussions. This is due to the fact that, other potential borrowers may be denied to access credit facilities since part of the funds that could be extended as loans by the rural banks are still knotted to NPLs. The non-performing loans also affect the economy of a country which explains the rationale behind the setting of guidelines by the central bank for enabling financial institutions to alleviate NPLs (Lata, 2014).

Despite the heavy regulation and ongoing efforts made to control the banking industry in general and the lending activities in particular, the NPLs problems are still a worldwide headache and a major concern for both international and local regulators. In Ethiopia, the banking environment has undergone many regulatory and financial reforms like other African countries with the aim of improving profitability, efficiency and productivity Waweru and Kalani (2009).

The banking industry in Ethiopia is characterized by operational inefficient, little and insufficient competition and perhaps can be distinguished by its market concentration towards the big government owned commercial bank, poor credit risk management practices and eventually less contribution to the GDP as compared to the developed world financial institutions. Operational inefficiency and poor credit risk management are usually associated with sizeable volume of NPLs. In this regard, to control the adverse impact of increasing non-performing loans in Ethiopian banking sector, the National Bank of Ethiopia has issued a directive which strictly requires all banks to maintain ratio of their non -performing assets below five percent (Hennie and Sonja, 2009).

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

Each non-performing loan in the financial sector is viewed as an obverse mirror image of an ailing unprofitable enterprise. Virtually all research on the causes of bank and thrift failures find that failing institutions have large proportions of non-performing loans prior to failure and those non-performing loans are a statistically significant predictor of in. From this point of view, the eradication of non-performing loans is a necessary condition to improve the economic status of the financial institution. First and most effective step to treatment of this chronic and epidemic pain is pathology and then finding of effective solutions for modifying and improving of banks conditions as the country's greatest economic patient. Pathology of causes and factors that will raise NPLs amount and provision of practical solutions can reduce the damaging effect of NPLs on banks (Khemraj and Pasha, 2012).

As far as the researcher knowledge, most of the studies were conducted on determinants of NPL, i.e Daniel (2010), Habtamu (2015), Anisa (2015) and Mesay (2017). The related studies conducted by Daniel (2010) and Habtamu (2015) assessed the determinants of NPLs in Ethiopian commercial banks focusing on bank-specific variables. The study by Anisa (2015) and Mesay (2017) combined both the macroeconomic and bank specific factors but both the studies utilize the same macroeconomic variables. Hence, Most of them they tried to show determinant instead of disclosing the effect of NPL factors by adding crucial variable. Thus, due to the severity of the problem pertaining to this topic incorporating crucial variables collectively is what motivated the researcher to examine how NPL factors that affecting profitability of private commercial banks in Ethiopia.

### **1.3 Research question**

Base on the above statement of the problem the researcher develops the following research question.

- What are NPL factors that affect profitability of Ethiopian private commercial banks?

### **1.4 Objective of the Study**

#### **1.4.1 General Objective**

The general objective of the study is to examine the effect of NPL factors on profitability of Ethiopian private commercial banks.

#### **1.4.2 Specific Objectives**

The specific objectives of the study are;

- To examine the impact of nonperforming loan ratio on profitability of Ethiopian private commercial banks
- To investigate the effect of cost income ratio on profitability of Ethiopian private commercial banks
- To analyze the impact of loan recovery rate on profitability of Ethiopian private commercial banks
- To scrutinize the impact of Bank's size on profitability of Ethiopian private commercial banks
- To examine the effect of loan to deposit ratio on profitability of Ethiopian private commercial banks scrutinize

## **1.5 Scope of the Study**

The study focused on the effect of NPL on profitability of Ethiopian private commercial banks and use secondary source of data for analysis purpose. The study takes in to account financial data of banks for the last 21 years that is from 2000 G.C to 2020 G.C. As a result, the research incorporated private commercial banks started their operation before or on 2000 G.C, these are six (Dashen, Awash, Wegagen, Hibret Bank, NIB and Bank of Abyssinia banks) private commercial banks who operate in Ethiopian. These banks were selected due to their market share. As NBE (2017/18) annual report stated, these six private commercial banks together accounted for 61% of the market share based on their number of branch and capital held by all Ethiopian private commercial banks. Moreover, the study used quantitative research approach and also employed one dependent variable return on asset, five independent variables that are NPL ratio, cost income ratio, loan recovery rate, bank size and loan to deposit ratio. As the result, these variables explained in the topic properly by referring previous empirical works.

## **1.6 Significant of the Study**

Many parties will be benefited from the findings that emerged from the results of the study and these are the following organ that will be benefited;

Bank's Management: Administration could be interested in identifying indicators of success and failure to take the necessary actions to improve the NPL performance of the company and choose the right decisions.

Government: Government might be concerned in knowing which companies operate successfully or failed to take the necessary measures so as to avoid crises of the bankruptcy in these companies.

Investors: Investors could be fascinated in such studies in order to protect their investment, and directing it to the best investment.

Customers: Customers may possibly involve in knowing the ability of banks to provide better services based on the indicators of success of the companies.

Academician: academicians could have a chance to know about the effect of NPL on profitability of Ethiopian private commercial banks which supports students to be familiar with it and find out a solution on their teaching and learning process.

Moreover, this research have significant role to play in shading light on how to better understand variables of NPL that have an impact on profitability of Ethiopian private commercial banks. Additionally, this study will have a paramount importance in providing a better ground for bank's managers, business professionals, business initiatives and policy makers. Moreover, the research will also contributes an insight point as a stepping stone for further study in the area to future researchers.

### **1.7 Limitation of study**

It's obvious that, incorporating all independent variables in a single econometrics model is impossible. And, that is why a disturbance term is usually incorporated in econometrics model (Brooks 2008). Hence, the study is limited to five variables (NPL ratio, cost income ratio, loan recovery rate, bank size and loan to deposit ratio) and one dependent variable (ROA). More over the study relies on secondary data sources only.

### **1.8 Structure of the study**

The research paper is organized in to five chapters. Chapter one is an introduction part where back ground of the study, statement of the problem, objectives of the study, scope, significance of the study were presented. Chapter two is review of literature in which theories, empirical evidence and conceptual frame work are identified. Chapter three contained research methodology where research design, research approach, population, sampling method, sample size, sources of data, instruments, data analysis technique, model specification, variable definition and hypothesis development were covered. Chapter four focused on the results and discussion in which the findings results that were interpreted. Finally, Chapter five brought of research to an end with summary, conclusion and possible recommendation.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

This section presented theoretical and empirical review on the effect of NPL factors on profitability of Ethiopian private commercial banks. Accordingly, the first part presented theoretical literature about different determinant of NPL on private commercial banks and also explained some theories which are related with the topic. Next to these, it presented the relationship between NPL factors and profitability. The second part discussed about various empirical studies. The gaps in existing literature described in the third part and the conceptual framework depicted in the fourth part.

#### **2.1 Theoretical Literature**

Loan means any financial assets of a development finance institution arising from a direct or indirect advance of funds (i.e. unplanned over drawings, participation in loan syndication, the purchase of loans from another lender, etc.) or commitment to advance funds by a development finance institution to a person that are conditioned on the obligation of the person to repay the funds, either on a specified date or dates or on demand, usually with interest. The term includes a contractual obligation of a development finance institution to advance funds to or on behalf of a person, claim evidenced by a lease financing transaction in which the development finance institution is the lesser, and line of credit to be funded by the development finance institutions on behalf of a person (NBE Directives No.SBB/ 48/2010).

A certain amount of money that is given by one party to the other party with the expectation of it being fully repaid is called a loan. The nature of this transaction is financial. All the specific terms and conditions that are a part of the transaction from either side are formally laid out in a promissory note. A lender granting temporary use of a sum of money to borrower, who must repay the money that, was borrowed over a fixed term, in addition to the interest on the loan or debt, that was incurred, defines loan. There is a stated due date to the borrower by the lender to repay the money back to the borrower, but if the borrower failed to repay the stated money back, the lender charges late fee from those persons who do not return the money on the due date. (NBE Directives No.SBB/ 48/2010).

### **2.1.1 Credit Activity**

The word "Credit" is derived from Latin word *credidum*, which means to believe or trust. In economics, the term credit refers to a promise by one party to pay another for money borrowed or goods or services received. It is a medium of exchange to receive money or good on demand at some future date. Credit defines as the right to receive payments or the obligation to make payment on demand at some future time on account of the immediate transfer of goods Waweru and Kalani (2009).

The principal reason commercial banks are operating in their environment is to maximize their profit by extending credit facilities to their customers. Banks are expected to support their local business communities with an adequate supply of credit for all legitimate business and consumer financial needs and to price that credit reasonably in line with competitively determined interest rates. Indeed, it is the principal economic role of banks-to provide loans to the business entities and individuals who are engaged in various economic activities (Agriculture, manufacturing and industry, import/ export, trade and services, housing etc...). The bank's role in finding involves assisting prospective borrowers by availing working or investment capital from which it generates profit. How well a bank performs its lending function has a great deal to do with the economic development of the country, because bank loans support the growth of new businesses and creates jobs within the banks' environment and promote economic growth, Moreover, bank loans often seem to convey positive information to the marketplace about a borrower's credit quality, thereby enabling a borrower to obtain more and perhaps somewhat cheaper funds from other sources. For most commercial banks, loan accounts are half or more of their total assets and about half to two-third of their revenue, moreover, risk in banking tends to be concentrated in the loan portfolio when a bank gets serious financial trouble, its problems usually come from loans that have become uncorrectable due to mismanagement, illegal manipulation of loan, misguided lending policies, or unexpected economic downturn. (Yonas, 2004)

### **2.1.3 Types of credit in Bank**

According to IMF (2005), the great variety of credit line results from the widely varying needs and activities of borrowers and lenders. Credit can be classified in different ways, but usually in banking sector it can be classified based on two criteria:

#### **I. Based on the needs of customers and nature of their business**

**Overdraft Facility:** This is credit facility by which customer is allowed to withdraw cash in excess of their deposit up to the extent of an approved limit by the bank.

**Term Loan:** it is a type of credit facility giving for specific time. The duration may be short up on one year or medium up to five years and long above five years. These loans are paid by equal monthly, Quarterly or semi-annually repayments. Short-term loans are usually used for working capital needs; medium term loan may be extended to purchasing of public transport vehicles, equipment, trucks and trailers ... etc. Long- term loan extended for new investment projects, manufacturing, and building and constructions purpose.

**Merchandize Loan** - When a loan is granted against the pledge of merchandise goods for a short period it is called merchandise loan.

**Letter of credit Facility** - When importers are not in opposition to cover fully the value of the letter of credit to be opened for goods intended to be imported, the bank provide them advance to cover some part of the cost and deal with the exporters' bank on behalf of the importer.

#### **II. Based on Economic Sectors**

Loans can be classified based on the purpose they involved in the economic sector. These economic sectors are Agricultural production, manufacturing production, Domestic trade and Service, Building and Construction and import - Export loan categories.

### **2.1.4 What is Non-Performing Loan?**

According to National Bank of Ethiopia directive number SBB/43/2008, “Nonperforming” means 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 advance is in question.

“A non-performing loan is a loan that is in default or close to being in default. Many loans become non-performing after being in default for three months but this can depend on the contract terms. A loan is non-performing when payments of interest and principal are past due by 90 days interest payments have been capitalized, refinanced or delayed by agreement or payments are more than 90 days overdue, but there are other good reasons to doubt that payments will be made in full” (IMF,2005).

According to NBE directives (2010) Loans or advances with pre-established repayment programs are nonperforming when principal and/or interest is due and uncollected for ninety consecutive days or more beyond the schedule payment date or maturity.

Overdraft and loans or advances that do not have a pre – established repayment program shall be considered non – performing when.

- The debt remains outstanding for ninety consecutive days or more beyond the scheduled payment date or maturity.
- The debt exceeds the borrowers approved limit for ninety consecutive days or more.
- Interest is due and un collectable for ninety days or more or
- The account has been in active for ninety consecutive days and /or deposits are insufficient to cover the interest capitalized during the period.

Non-performing loan is a loan that is not earning interest income and:-

- a) Full payment of principal and interest is no longer expected.
- b) Principal or interest is 90 days or more delinquent.
- c) The maturity rate has passed and payment is full has not been made

Non-performance loan are not generating income as a first step, loans are often considered to be non-performance when principal or interest on them is due and left unpaid for 90 days or more (this period may vary by justification). The borrower cash flow and overall ability to repay amount is significantly more important than whether the loan is overdue or not.

- Non-performing loan are those in which borrowers are experiencing some repayment problems. Past due loans represent loans for which contracted interest and principals payments have not been made within 90 days after the due date.

- According to World Bank, asset classification is important for repayment of loan. Asset classification is the process whereby an asset is assigned a credit risk grade, which is determined by the likelihood threat debt obligations, will be serviced and debt liquidated according to contract terms.

According to NBEs directive SBB/48/2010, loans & advances are classified in to five. Those are:-

### **1. Pass**

Loans in this category are fully protected by the current financial and paying capacity of the borrower and are not subject to any criticism. Notwithstanding the generality of this statement, the following loans shall be classified pass: short term loans past due for less than 30 (thirty) days, medium and long term loans past due for less than 90 (ninety) days; and any loan, or portion thereof, which is fully secured, both as to principal and interest, by cash or cash-substitutes, regardless of past due status or other adverse credit factors.

### **2. Special Mention**

The following loans at a minimum shall be classified special mention: short term loans past due for 30 (thirty) days or more, but less than 90 (ninety) days; medium and long term loans past due 90 (ninety) days or more, but less than 180 (one-hundred-eighty) days;

### **3. Substandard**

The following non-performing loans at a minimum shall be classified substandard: short term loans past due 90 (ninety) days or more, but less than 180 (one-hundred-eighty) days and medium and long term loans past due 180 (one-hundred-eighty) days or more, but less than 360 (three-hundred-sixty) days.

### **4. Doubtful**

The following non-performing loans at a minimum shall be classified doubtful: short term loans past due 180 (one-hundred-eighty) days or more, but less than 360 (three-hundred-sixty) days and medium and long term loans past due 360 (three-hundred-sixty) days, but less than 3 (three) years.

### **5. Loss**

The following non-performing loans at a minimum shall be classified loss: short term loans past due 360 (three-hundred-sixty) days or more and medium and long term loans past due 3 (three) years or more.

## **2.1.5 Causes for Non-Performing Loans**

According to Wondimu (2015), causes for non-performing loans are merely varied from bank to bank as well as countries to countries. Even the classification of this causes differ from one bank to another. Some classified them based on the level of the responsibility for the occurrence of NPLs.

### **1. Internal factors**

- Lack of continuous follow up of repayment due to manpower shortage
- Lack of consultation and communication with defaulter
- Overstating the collateral value at the time of estimation
- Lack credit information to be gathered from other commercial banks
- Agency problem (i.e. branch managers focus merely on increasing their loan portfolio by accepting borrowers without making due analysis)

### **2. External factors**

Diversion of the borrowed fund to other purposes

- Unavailability of demand and price fluctuation on both local and international market.
- Country's economic and political condition
- Impact of change fiscal and monetary policy
- Insufficient credit awareness
- Unwilling customer to disclose the information required
- Unethical computation made between banks
- Willful default

There are large macroeconomics reasons for wide spread of NPLs and the causes for it have multi faced dimensions such as structural systematic policy and managerial though different banks encounter different causes for NPLs general consensus of common causes, are also there. Some of these common causes are; bankruptcy of the borrower business, absence of risk assessment, poor follow up, Lack of credit information and moral hazard (Haregewoin, 1999).

Although the causes of NPLs different form bank to bank, the following are the bank and self – explanatory reasons for the occurrence of NPLs in the commercial banking sector of Ethiopia (Yonas, 2004).

- Providing loan over the total capital of the forms or business entities
- Providing loan without sufficient back up /adequate safety of collateral or security
- Providing loan without sound credit principal and appraisals
- Providing loan to unfamiliar borrowers and without adequate information about the borrower.
- Providing loan without the quality and dependability of personal guarantee
- Providing loan (large sum) without audited financial statement of borrower firm /company
- Providing additional loan without additional collateral
- Providing loan without the expertise of engineering appraisal and without consideration of depreciation and current fair value of the property of the borrower
- Providing loan without sufficient credit history or information of the borrower
- Providing loan with a collateral, which has no legal document, or registration with the municipality.
- Providing loans without viable project/business proposals
- The damages of NPLs on commercial banks occurred due to the above causes aggravated because of the way that the banks try to recover sick loans.

### **2.1.6 Determinants of Bank's Profitability**

Determinates of bank profitability are bank specific variables which influence the financial performance of any bank. These determinants are within the scope of the bank to manipulate them and that they differ from bank to bank. These include capital size, size of deposit liabilities, size and composition of credit portfolio, interest rate policy, labor productivity, and state of information technology, risk level, management quality, bank size and ownership. CAMEL framework often used by scholars to proxy the bank specific factors (Yonas, 2004). CAMEL stands for Capital Adequacy, Asset Quality, Management Efficiency, Earnings Ability and Liquidity.

#### **A. Capital Adequacy**

Capital adequacy refers to the sufficiency of the amount of equity to absorb any shocks that the bank may experience (Kosmidou, 2008). Capital is the amount of own fund available to support the bank's business and act as a buffer in case of adverse situation. Banks capital creates liquidity for the bank due to the fact that deposits are most fragile and prone to bank runs. Moreover, greater bank capital reduces the chance of distress. However, it is not without drawbacks that it induce weak demand for liability, the cheapest sources of fund Capital adequacy is the level of capital required by the banks to enable them withstand the risks such as credit, market and operational risks they are exposed to in order to absorb the potential losses and protect the bank's debtors. The adequacy of capital is judged on the basis of capital adequacy ratio (CAR). Capital adequacy ratio shows the internal strength of the bank to withstand losses during crisis. Capital adequacy ratio is directly proportional to the resilience of the bank to crisis situations. It has also a direct effect on the profitability of banks by determining its expansion to risky but profitable ventures or areas (Sangmi& Nazir, 2010).

### **B. Asset Quality**

The bank's asset is another bank specific variable that affects the profitability of a bank. The bank asset includes among others current asset, credit portfolio, fixed asset, and other investments. Often a growing asset (size) related to the age of the bank ((Sangmi& Nazir, 2010). More often than not the loan of a bank is the major asset that generates the major share of the banks income. Loan is the major asset of commercial banks from which they generate income. The quality of loan portfolio determines the profitability of banks. The loan portfolio quality has a direct bearing on bank profitability. The highest risk facing a bank is the losses derived from delinquent loans. Thus, nonperforming loan ratios are the best proxies for asset quality. Different types of financial ratios used to study the performances of banks by different scholars. It is the major concern of all commercial banks to keep the amount of nonperforming loans to low level. This is so because high nonperforming loan affects the profitability of the bank. Thus, low nonperforming loans to total loans shows that the good health of the portfolio a bank. The lower the ratio the better the bank performing (Sangmi & Nazir, 2010).

### **C. Management Efficiency**

Management Efficiency is represented by different financial ratios like total asset growth, loan growth rate and earnings growth rate. Yet, it is one of the complexes subject to capture with financial ratios. Moreover, operational efficiency in managing the operating expenses is another dimension for management quality. The performance of management is often expressed qualitatively through subjective evaluation of management systems, organizational discipline, control systems, quality of staff, and others. Yet, some financial ratios of the financial statements act as a proxy for management efficiency. The capability of the management to deploy its resources efficiently, income maximization, reducing operating costs can be measured by financial ratios. One of this ratios used to measure management quality is operating profit to income ratio (Rahman et al., 2009).

The higher the operating profits to total income (revenue) the more the efficient management is in terms of operational efficiency and income generation. The other important ratio is that proxy management quality is expense to asset ratio. The ratio of operating expenses to total asset is expected to be negatively associated with profitability. Management quality in this regard, determines the level of operating expenses and in turn affects Sangmi and Nazir, 2010).

#### **D. Liquidity Management**

Liquidity refers to the ability of the bank to fulfill its obligations, mainly of depositors. According to Rahman et al., (2009) adequate level of liquidity is positively related with bank profitability. The most common financial ratios that reflect the liquidity position of a bank according to the above author are customer deposit to total asset and total loan to customer deposits. Other scholars use different financial ratio to measure liquidity. For instance, cash to deposit ratio to measure the liquidity level of banks in Malaysia. However, the study conducted in China and Malaysia found that liquidity level of banks has no relationship with the performances of banks (Said and Tumin, 2011).

Several theories have been promulgated to explain financial performance. Nevertheless, the theories that explain non-performing loans are scanty. This study will discuss five theories that seek to explain the two concepts. The first two theories explain the need for financial performance and the last three presents need for credit activity.

### **1. THE STEWARDSHIP THEORY**

The rationale behind the stewardship theory is to lay more emphasis on the agency theory which assumes that there is rigidity between the risk tendency of heads and their subordinates whereby subordinates focus their actions upon alleviating their principal risk at the expense of principals.

The agency theory postulates that owners must identify the existence of this tension and prevent subordinate activity that has a link with moral hazards by monitoring managers and developing strategies that align the interests of subordinates with heads and prevent opportunistic actions by the subordinates. Stewardship theory on the other hand assumes that leaders act as trustworthy stewards of the organization and work towards the collective good of the constituents in the firm irrespective of the manager's self-centeredness (Donaldson and Davis 1991).

### **2. THE STAKEHOLDER THEORY**

The stakeholder theory was proposed based on the argument that apart from stakeholders there are numerous agents with an interest in the movements and deliberations of companies. Stakeholders are said to groups and the beneficiaries of such groups are affected by and their rights are either respected or violated by corporate actions. In addition to shareholders, stakeholders include creditors, customers, employees, suppliers and the communities at large. The Stakeholder theory asserts that businesses have a social obligation that requires them to take into consideration the interests of all parties affected by their actions. Management should not solely consider its shareholders when making decisions pertaining to the organization, but also any individual who is harmed by the business decisions. The stakeholder theory exhibit some views which goes contrary with the classical theory, the stakeholder theory holds the view that "the aim of any organization is or should be the prosperous of the organization and its key stakeholders (Freeman et al., 2004).

### **3. THE FINANCIAL ACCELERATOR THEORY**

This theory seeks to explain how lending and borrowing activities of organizations are largely affected by small economic tremors. This theory depends on the interaction between the external finance premium that arises due to unequal flow of information between borrowers and lenders and economic agents' net worth. Economic agents' net worth can be defined as: the sum of liquid assets plus collateral value of illiquid assets minus outstanding obligations; and the external finance premium can be defined as: the difference between the cost of funds raised externally and opportunity costs internal to the firm. The theory reported that for debt financing, borrowers are motivated to take projects that are more risky. These projects are those that have a high propensity to generate large return, than projects offering low returns. These projects are preferred from borrowers since the firms losses in the case when the project's return is low and are limited to zero by legal regulation. These projects are unfavorable from the lender's point of view since they bear all, or most of, the costs in the case of low project returns. The theory also designates that due to economic tremors, the borrowers may not have the aptitude to borrow and the probability of them avoiding the repayment of their loans or external finance (Bernanke et al.,1999).

### **4. CREDIT RATIONING THEORY**

This theory suggests that lenders based on prevailing interest rates and available collateral or substitutes for collaterals to control the amount of credit they give out to borrowers. Decision making by lenders to either lend or not to lend is conditional on the kind of surety the borrowers present to them. To avoid riskier investment and the chances of the borrowers not fulfilling their credit obligations, lenders give out loans at low interest rates. The provision of loans based on other alternatives to collateral provides borrowers with an avenue of defaulting from repaying their loans since their relationship with the lender is not as strong when collateral is involved. The credit rationing theory suggests that interest rate is very significant in determining the amount a financial institution will be willing to lend and determine the ability of the borrower to repay the loan (Talata, 2015).

### **2.1.7 NPLs AND PROFITABILITY**

Report has been made that the effect of NPLs has not been felt by on the lending institutions but economy as a whole. According Klein (2013), the financial crisis that occurred 2008 had a significant impact on the individual financial institutions financial performances. Most countries in the whole wide world were also affected by this economic down turn. Management of non-performing loans becomes extremely hard by the rural banks when it is allowed to increase to certain levels. When this happens more resources are needed to be invested to cater for the unpaid loans and supplementary costs will be suffered in funding retrieval struggles. Costs and provisions consume a large share of the profit that is made by the rural banks which result to performance retardation.

The size of non-performing loans in rural banks also defines how viable they are. Nonperforming loan serves as is one of the major financial performance determiners of rural banks. The aforementioned justifies how significant non-performing loans are when it comes to determining financial performance levels of the rural banks. According to Mwangi (2012) there is an opposite relationship between banks financial performance and non-performing loans. The study further reported that the higher the non-performing loans the lower financial performance as measured by return on asset and vice versa. The financial performance of a bank is dependent on the management practices pertaining to non-performing loan. This signifies that the best practices in non-performing loan management has the prospect of improving upon the financial performance of that institution.

As stated by Mutuku (2016), performance in terms of profitability is a benchmark for any business enterprise including commercial banks. However, increasing Non Performing Loans have a direct impact on profitability of banks by diluting returns on assets. Non-performing assets therefore have negative effect on return on Assets (ROA), a measurement of profitability. Non-performing loans erode banks' profitability in that banks could incur heavy disposal expenses. Nonperforming Loans Assets have opportunity costs, in that the non interest earning assets (mainly inform of money) could have been invested elsewhere and provide earnings. Beside this, Banks are also required to make provisions for losses on non performing assets which in turn affect profitability and there is cost associated to attempts to recover bad loans.

Berger et al. (1997) in study of Problem Loans and Cost Efficiency in Commercial Banks linked Problem Loans with Cost efficiency, which in turn affects profitability. Non-performing loans can be treated as undesirable outputs or costs to a loaning bank, which decrease the bank's performance (Chang, 1999). According to Kroszner (2002), non-performing loans are closely associated with banking crises. Batra (2003) noted that in addition to the influence on profitability, liquidity and competitive functioning, NPL also affect the psychology of bankers in respect of their disposition of funds towards credit delivery and credit expansion. Focus on Nonperforming loans leads to the credit risk management assuming priority over other aspects of bank's functioning Batra (2003). The bank's whole machinery would thus be pre-occupied with recovery procedures rather than concentrating on expanding business. Thus, NPL impact the performance and profitability of banks. The most notable impact of NPL is change in banker's sentiments which may hinder credit expansion to productive purpose. Banks may incline towards more risk-free investments to avoid and reduce riskiness, which is not conducive for the growth of economy. Michael et al. (2006) emphasized that NPA in loan portfolio affect operational efficiency which in turn affects profitability, liquidity and solvency position of banks.

### **2.1.8 Laws relating to Control of Non- Performing Loans in Ethiopia**

In order to create a climate of confidence conducive to private sector business activities, appropriate laws that provide the necessary environment are necessary. Current theories on which economic development policies are based, as well as the guidelines of international financial institutions that provide technical assistance to developing countries are pursuing free market economic policies, emphasize the critical importance of having a modern commercial law infrastructure. The legal infrastructure should enable the developing or transitioning economy to have in place properly functioning credit and other financial systems that stimulate domestic and foreign investment. NBE's surveillance mechanisms require banks to submit key financial data such as the composition of lending and the scale of non-performing loans on a regular basis, in order to identify all the risks to which each bank is exposed. Commercial banks are legally required to make 100 percent provision against "bad" loans ( those with no collateral) and 50 percent provision of "doubtful" (those for

which repayment is more than one year late, and for which there is no adequate security) (NBE,2008).

The National Bank of Ethiopia also is given a power under Article 22 of the proclamation to issue directives concerning the conditions and limitations on investments of banks and a loan, advance or other credit facility, financial guarantee or any other commitments or contracts given by a bank, directly and indirectly to a person. The NBE issued directives on loan provision requirements and the responsibility of the banks to maintain their capital adequacy. This helps the banks not to make any decision which results in financial distress (NBE, 2008).

## **2.2 Empirical evidence from different studies**

### **2.2.1 International Empirical Review**

Kolapo, et al. (2012) also analyzed the influence of credit risk on performance of five banks in Nigeria by taking data from 2000-2010. Credit risk is measured by taking ratio of nonperforming loans to loans plus advances, total loans to advances plus deposits and ratio of loan loss provisions while performance is measured by return on assets. Fixed effect model used in the study and according to results of regression analysis, non-performing loans and loan losses provisions are adversely affecting the performance while total loans to advance plus deposit ratio has positive significant effect on the performance. This is evident from the study that banking industry needs to improve their loan administration processes for maximization of profits.

Mohammed (2012) studied the bank performance in context of corporate governance for which mainly the ratios of non-performing loans and loan deposits have been used. Study was conducted on 9 banks of Nigeria for a period of 10 years from 2001-2010. According to generalized least square regression results, non-performing loans ratio has significant negative effect while loan deposit ratio has insignificant negative effect on performance. So, survival of banks is strongly dependent upon the better asset quality means dependent upon minimizing the non-performing loans ratio.

Azeem & Amara (2013) study Impact of profitability on quantum of non-performing loans in Pakistani Banks. The Data of one business cycle of sixteen Pakistani banks were collected from 2006 to 2012. The sample comprised of sixteen public and private banks with different sizes.

Three models were adopted to check the relationship between profitability and nonperforming loans. Model one represented return on asset as dependent variable while nonperforming loans were taken as independent variable.

Model two represented Return on Equity as dependent variable while non-performing loans were taken as independent variable. Model three represented Stock Return as dependent variable while non-performing loans were taken as independent variable. The study found that NPLs disturb the profitability of banks and every other financial institution, which is involved in lending activity and that in State Bank of Pakistan, there are some reasons noted to have intensify this issue which are namely; marks up on markup, embezzlement in amount, wrong calculation procedures and divergent practices in calculating amount of NPLs. However, data of non-performing loans in Pakistan was only available from six years 2006 to 2012 and a Short panel of sixteen Banks only was used in the study (Azeem & Amara, 2013).

Shingjergji (2013) studied the impact of different bank specific factors on non-performing loans of Albanian banks by taking quarterly data from 2002-2012. Dependent variable used in the study is non-performing loans (NPLs) while independent variables include capital adequacy ratio (CAR), loan to asset ratio (LTA), return on equity (ROE), natural log of total loans, and natural log of net interest margin (NIM). Regression results obtained by using ordinary least square revealed negative insignificant relation of CAR with NPLs. Relation of loan to asset ratio has been found negative but total loans level is positively influencing the NPLs means increased loans level will result in increased level of NPLs. On the other hand, NIM and ROE are negatively linked with NPLs depicting that high NPLs deteriorate the performance of banks.

Kaaya & Pastory, (2013) analyzed effect of credit risk (measured by ratios of nonperforming loan, loan loss to gross loan, loan loss to net loan and impaired loan to gross loan) on banks' performance (measured by return on assets) by controlling the effect of deposits and bank size. A sample of 11 banks in Tanzania has been used for this analysis. According to correlation and regression results, credit risk measures of non-performing loans, loan loss to gross loan, loan loss to net loan have significant negative influence on banks' performance. It is concluded that performance of banks can be increased by effective risk management as it help to reduce non-performing loans and loan losses.

Vatansever & Hepsen, (2013) investigated the presence of any significant relation (if exists) of non-performing loans with macroeconomic indicators, global and bank level factors in

Turkey for a period of January 2007 to March 2013. Results obtained from ordinary least square regression helped in categorizing the factors significantly affecting the non-performing loans. Among various macroeconomic, global and bank level factors used in the study, only the variables of industrial production index, Istanbul stock exchange 100 Index, inefficiency ratio of all banks have significant negative effect while unemployment rate, ROE and capital adequacy ratio have positive significant effect on non-performing loans.

Mausya (2009), study the impact of non-performing loans on the Performance of the banking sector in Kenya, an MBA project submitted to University of Nairobi and in his findings, indicated that commercial banks are negatively affected by raising levels of non-performing loans through provisioning made and interest in suspense. She outlines that majority of such factors include under staffing, under qualified staff among others for years 2004-2008. In the study, a sample of thirteen banks is used to show how these factors affect the performance of these banks where the performance is represented by the profit before tax of the 13 sampled banks. The research used a single regression equation approach to analyze the impact of nonperforming loans to financial sector stability. A second test with all the variables was run and finally one with just NPLs interest income and provision as per the study framework Tests of significance was be done to determine whether the effect of nonperforming loans on profitability is significant. From the equation in chapter for the findings indicate that commercial banks will be negatively affected by raising levels of non-performing loans through provisioning made and interest in suspense. From the study, the findings indicate that commercial banks are negatively affected by raising levels of non-performing loans through provisioning made and interest in suspense.

Kithinji (2011), study Credit risk management and profitability of commercial banks in Kenya, paper submitted to Aibuma conference, Nairobi, Kenya. Non-performing loans was measured using nonperforming loans/ total loans, and profits were measured using ROA (Return on Total assets). The trend of level of credit, nonperforming loans and profits were established during the period 2004 to 2008. A regression model was used to establish the relationship between amount of credit, non-performing loans and profits during the period of study. R<sup>2</sup> and t-test at 95% confidence level were estimated. Her findings reveal that the bulk of the profits of commercial banks is not influenced by the amount of credit and nonperforming loans suggesting that other variables other than credit and nonperforming loans impact on profits. The results indicated that there is no relationship between profits, amount of credit and the level of nonperforming loans. The research did not use other factors affecting profitability of commercial banks as control variables in the study and the study covered only 6 year period.

Macharia (2012) study the relationship between the level of nonperforming Loans and the financial performance of commercial banks in Kenya an MBA project submitted to University of Nairobi. Multi linear analytical model was used to determine the relationship between the NPLs and the financial performance of commercial banks. The relationship between these bad loans and the financial performance represented by ROA was regressed. After determining the level of NPLs across the banks and the total outstanding shares, the relationship between these variables was obtained. This involved regressing the NPLs with the ROA of the firm for entire period of the study. NPLs were the independent variable in the regression equation while ROA was the dependent variable. The study regression results indicate that there is no relationship between profits, amount of credit and the level of non-performing loans. The findings reveal that the bulk of the profits of commercial banks are not influenced by the amount of credit and nonperforming loans suggesting that other variables other than credit and nonperforming loans impact on profits. The study however did not consider other factors affecting profitability of commercial banks such as Capital, Liquidity and management efficiency as controlling variables.

Mombo (2013) study the effect of non-performing Loans on financial performance of deposit taking micro finance Institutions in Kenya an MBA project submitted to University of Nairobi. The researcher used simple linear regression model used in establishing the effect of non-performing loans on commercial banks in Kenya. One control variable which was operating expenses of microfinance institutions and it was measured as a percentage of the total revenue by microfinance institutions. The study made use of secondary data that was obtained specifically from the financial stations of the microfinance institutions. The study found out that non performing loan in deposit taking microfinance institutions account for the greatest percentage of the variance in the profitability of the institutions. All the three independent variables in the study; non performing loans, rate of loan repayment and operational expenses largely affect the profitability of the institutions and that non performing loans and operational expenses have more significant effect than the rate of loan repayment that is achieved by the organization.

Mugwe (2013) study the relationship between firm-specific factors and financial performance of commercial banks in Kenya. The study determines and evaluates the relationship between bank-specific factors; capital adequacy, asset quality, liquidity and management efficiency on the financial performance of Commercial Banks in Kenya. Secondary data of the 43 Kenyan commercial banks from 2008 to 2012 obtained from published Audited Accounts of the Commercial Banks, the Central Bank of Kenya Annual Reports. The data will be analyzed using Multiple Regressions method. The findings show that bank specific actors considered are significantly associated with financial performance as indicated by the positive mean values and their respective standard deviations. This means that bank specific factors variables considered in the study Capital Adequacy, Liquidity, Management Efficiency and Asset Quality are very crucial in affecting financial performance of commercial banks in Kenya. The study results show that the capital strength of a bank is of paramount importance in affecting its profitability and the asset quality affects the performance of banks adversely.

As studied by Mutuku (2016) about the effects of NPLs on profitability of commercial banks in Kenya. The study population consisted registered commercial banks in Kenya, (CBK, 2016). Profitability measured by return on assets was used as dependent variable and non performing loans measured by NPLs ratio was used as independent variable. To improve the accuracy and reliability of the tests Capital adequacy, Operational efficiency and Liquidity were used as control variables. The research covered all commercial banks in Kenya for the last ten years that is 2006-2016 and used secondary data to analyze and draw conclusions and recommendations. The study indicates that there is negative effect of nonperforming loans ratio on return on assets, confirming that non performing loans negatively affects profitability of commercial banks in Kenya. Managers of Commercial banks in Kenya have to work hard to enhance profitability of commercial banks and reduce occurrences of nonperforming loans. This includes taking measures to mitigate against moral hazard and adverse selections in advancing loans, example, use of credit reference bureaus. Central bank of Kenya should enhance supervision of commercial banks and consider analysis of relationship between ratios of nonperforming loans and profitability to enhance understandability and avoid concentrating on quantum figures alone. Investors and shareholders should also take action to caution against possible use of provisions for losses on non performing loans for smoothing earnings by the managers. This paper therefore provides an insight to commercial banks, central bank and other stake holders on the effect of nonperforming loans on profitability of commercial banks in Kenya and provides a basis for further research.

According of Talata (2015) study conducted on the effect of non-performing loans on financial performance and trend of incidence of non-performing loans. The polynomial function was employed to determine the trend of the incidence of non-performing loans. The results of the OLS revealed that non-performing loans, cost-income ratio, loan recovered and total revenue were all statistically significant at 1% significance levels respectively. The liquidity risk was not statistically significant. The non-performing loans and cost-income ratio had a negative influence on financial performance whereas total revenue and loan recovered had a positive effect on financial performance. The polynomial trend analysis revealed that non-performing loans in all the selected banks showed an increasing trend. The study therefore recommends that, the six rural banks should improve their credit management so as to avoid the fall in their profitability.

As per Shahbaz et al (2012) study conducted on the impact of risk management on non-performing loan and profitability of banking sector of Pakistan. Five banks were selected for data collection and whole data was secondary in nature. The result of this study reveals that there is no proper mechanism for risk management in banking sector of Pakistan. Study also concluded that non-performing loans are increasing due to lack of risk management which threatens the profitability of banks. This study provides suggestion that banking sector can avoid their non-performing loans by adopting methods suggested by state bank of Pakistan.

As per Zurairah (2010) study conducted which attempts to explore the specific bank factors that contribute to these nonperforming loans in Malaysia. Eight commercial banks have been the subject for the study ranging 2000 to 2008. The bank's financial statement has been the main source for the study and the panel analysis has been carried out to obtain the result for this empirical study. The study begins with the two tests namely F-test (Pooled OLS Model versus Fixed Effect Model) and Hausman test (Random Effect Model versus Fixed Effect Model) to determine the most suitable model to be used in this study. The empirical analysis supported the two variables used in this study, where loan growth showed a positive relationship with the dependent variable while interest income indicates negative movement with non-performing loans. Meanwhile bank size, risk profile and the maturity of loans have been found given insignificant impact on non-performing loans.

Study conducted by Ekanayake and Azeez (2015), this study investigates the determinant factors of ex-post credit risk considering non-performing loans (NPLs) as proxy variable in Sri Lanka's commercial banking sector and is carried out with a sample of nine licensed commercial banks for the period from 1999 to 2012. The study finds that the level of NPLs can be attributed to both macroeconomic conditions and banks' specific factors. It reveals that, NPLs tends to increase with deteriorating bank's efficiency. There is also a positive correlation between loan to asset ratio and NPLs. Meanwhile, banks with high level of credit growth associated with a reduced level of non- performing loans. Larger banks incur lesser loan defaults compared to smaller banks. With regard to macro-economic variables, NPLs vary negatively with the growth rate of GDP and Inflation and positively with the prime lending rate.

As per Eston et al (2016), the study was to investigate the effect of non-performing loan ratio and other determinants on the financial performance of commercial banks in the Malawian banking sector. The study covered a seven-year period from 2008 to 2014. Secondary data was used. The study used correlation research technique and regression analysis was carried out. The population of the data comprised the commercial banks licensed by the Reserve Bank of Malawi. Census study was conducted. The study found that non-performing loan ratio, cost efficiency ratios and average lending interest rate had a significant effect on the performance of banks in Malawi. Cash reserve ratio variable was positively related to bank performance but was not significant. The study recommends specific support from the monetary authorities and operations-enhancing innovation on the part of the banks themselves.

Based on Ihtesham and Adnan (2016) study conducted about to assess factors that may influence the rising level of nonperforming loans in commercial banks of Pakistan. The study uses Size, Return on Assets, Earning per Share, Cash to Total Asset, and investment to Total Asset, Capital Adequacy Ratio and Breakup value per share as determinants of nonperforming loans as banks internal factors. Panel data from 2006-2016 was taken from published annual reports and State Bank of Pakistan data base. Descriptive Statistics, correlation analysis and random effect panel least square regression was used to analyze data through STATA application software. The analysis leads to the conclusion that reduced level of nonperforming loans leads to increased banks performance. It was also concluded that Return on Asset, Earning per share, Capital adequacy ratio and Breakup value per share has got a significant impact on nonperforming loans.

### **2.2.2 Ethiopian Empirical Review**

Study conducted by Wondimu (2015), this study focuses on the impact of NPL on Dashen bank profitability. Bank loans have a vital contribution towards development of economy by financing different sectors. However, non-performing loans are leads to incidence of huge loss on banks profit in particular and country economy in general. Hence, this study was conducted to examine both internal factors (non-performing loan rate and lending interest rate) and external factors (Ethiopian inflation and GDP rate) impact of NPL on bank profitability. To this end, the researcher has selected Dashen bank S.C judgmentally. This study used secondary sources of data, which is cover the period 1999/00-2013/14. These data

were collected from Dashen bank S.C annual reports, memos, loan policy and procedure, NBE directives and CSA. Furthermore, a descriptive statics and linear regression model was used to examine the impact of NPLs by using SPSS version 20 software. This research is a quantitative research design, explanatory, that identifies the cause and effect relationships between the study variables and ROA. The finding of this study is significant since once identifying the impact of NPLs might enable management body to make appropriate lending policies that prevent the occurrence of NPLs. Furthermore, the study recommended the bank should emphasize the management of loans to reduce the level of nonperforming loans. Besides, it is better for the loan officers to provide financial counseling to the borrowers on the wise use of loan.

As per Zelalem (2013) study performed on the bank-specific and macro-economic determinants of Non-performing loans (NPLs) of commercial banks in Ethiopia. The study adopts a mixed methods research approach by combining documentary analysis (structured review of documents) and in-depth interviews. More specifically, the study reviews the financial records of eight commercial banks in Ethiopia and relevant data on macroeconomic factors considered for the period from the year 2000 to 2011. The findings of the study show that, loan growth, financial performance, operational efficiency, effective exchange rate, inflation rate and gross domestic product have negative and statistically significant relationship with banks' NPLs. On the other hand, variables like bank size and state ownership have a positive and statistically significant relationship with banks' NPLs. However, the relationship for average lending rate and income diversification were found to be statistically insignificant. The study suggests that focusing and reengineering the banks alongside the key drivers of NPLs could reduce the probability of loan default in Ethiopian commercial banks.

Based on Mesay (2017) study made on assessing the determinants of non-performing loan growth rate. 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 was used both primary and secondary data. The study target population comprises six Ethiopian private commercial banks and 12 manufacturing sub sectors (food and beverage and textile). The study adopts a

mixed methods research approach by combining documentary analysis (structured review of documents) and in-depth interviews. More specifically, the study reviews the financial records of six private commercial banks in Ethiopia and relevant data on macroeconomic factors considered for the period from the year 2000 to 2015. The sampling of the study includes six private commercial banks, from 16 private commercial banks based on their share of total outstanding loan. The collected panel data is analyzed using descriptive statistics, 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. Based on the finding the study recommended that Loan growth, business profit margin, loan to deposit ratio and deposit interest rate were significant driver of NPLs, hence focusing and engendering the institution alongside these indicators could reduce the probability of NPL in Ethiopian private commercial banks.

Study made by Sitina (2018) about the bank-specific and macro-economic determinants of Non-performing loans (NPLs) of commercial banks in Ethiopia. Nine commercial banks have been the subject for the study ranging from 2007 to 2016. The study employs an explanatory research design and a quantitative research approach moreover; a random effect model was used. The empirical results showed that trade openness positively and significantly affects non-performing loans, whereas, exchange rate, unemployment and loan growth affects NPLs negatively and significantly. Contrary to previous studies, the findings also showed an insignificant relationship of real lending rate, capital adequacy ratio and ownership structure with NPLs of Ethiopian commercial banks. The study suggests that, commercial banks should consider the macro economic factors before extending loans.

As stated by Muluwork (2016) study on the relationship between financial performance and non-performing loans of commercial banks in Ethiopia has been related by using performance as well as to test the existence of the relationship between the Capital adequacy, Asset Quality, Management efficiency, and Liquidity with the profitability measures. Since two of the banks are less than five years in operation and the other three are not commercial banks, the study has conducted on the financial performance of fourteen commercial banks examined by using panel data from year 2011 to year 2015. The study used quantitative

research approach and secondary financial data are analyzed by using multiple linear regression models for three profitability measures: ROE, ROA and NPM. Fixed effect regression model was applied to investigate the impact and relationship of: NPLR, capital adequacy, Asset Quality, Management efficiency, and Liquidity with bank profitability measures separately. The empirical result shows that Non –performing loans has negative relation whereas capital adequacy, and Management efficiency and liquidity have a slight positive relation, whereas asset quality shows a strong positive relationship with the mentioned profitability measures. Based on the findings, the study concludes that amount of the non-performing loans decreased significantly from the year 2011 to 2015 while the performance of the banks increased in the same period and this showed financial performance and non-performing loans have negatively related.

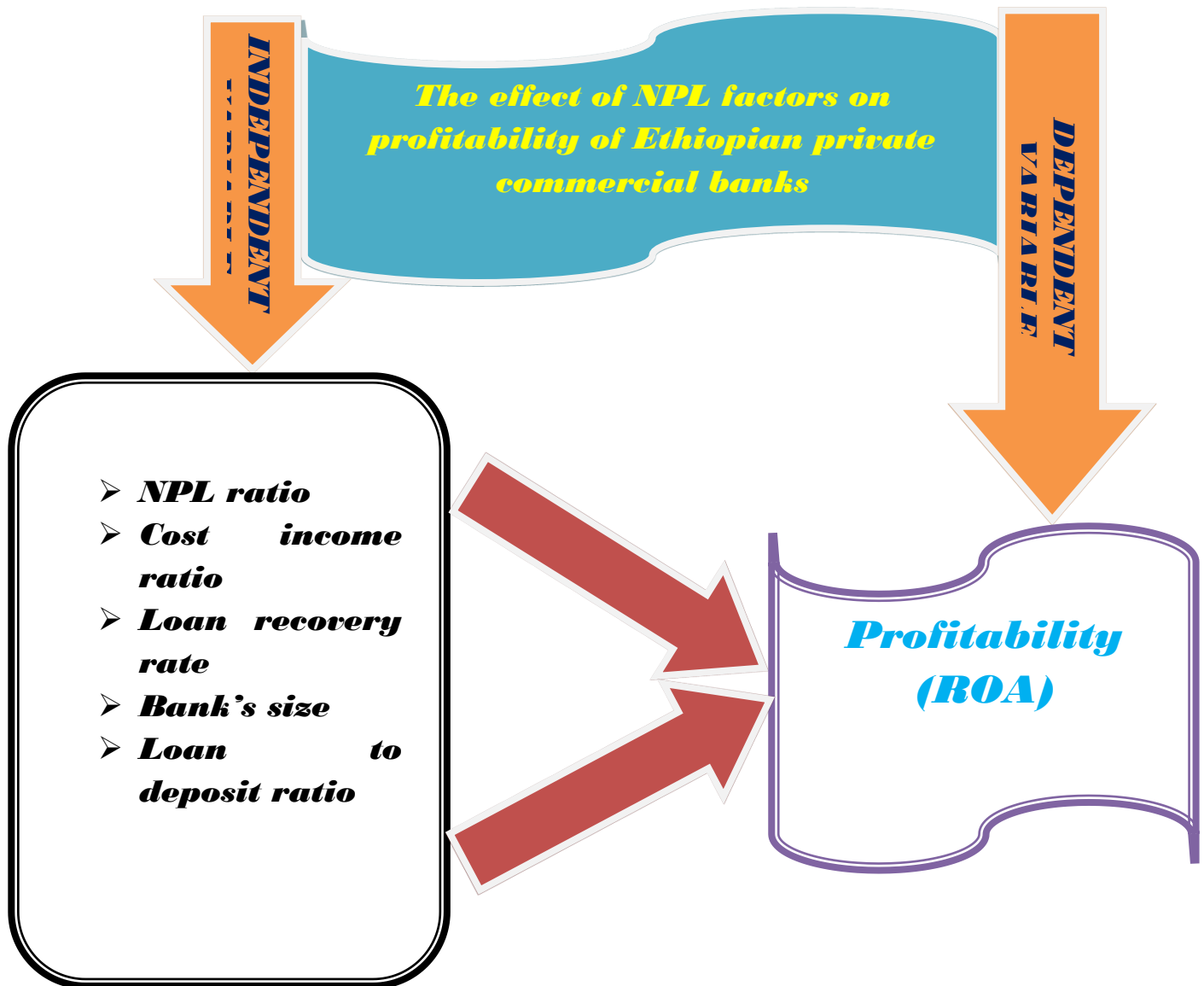
### **2.3 Literature gap**

Each non-performing loan in the financial sector is viewed as an obverse mirror image of an ailing unprofitable enterprise. Virtually all research on the causes of bank and thrift failures find that failing institutions have large proportions of non-performing loans prior to failure and those non-performing loans are a statistically significant predictor of in. From this point of view, the eradication of non-performing loans is a necessary condition to improve the economic status of the financial institution. Pathology of causes and factors that will raise NPLs amount and provision of practical solutions can reduce the damaging effect of NPLs on banks (Khemraj and Pasha, 2012). Most of the studies were conducted on determinants of NPL, i.e Daniel (2010), Habtamu (2015), Anisa (2015) and Mesay (2017). The related studies conducted by Daniel (2010) and Habtamu (2015) assessed the determinants of NPLs in Ethiopian commercial banks focusing on bank-specific variables. The study by Anisa (2015) and Mesay (2017) combined both the macroeconomic and bank specific factors but both the studies utilize the same macroeconomic variables.

### **2.3 Conceptual Frame Work**

From the theoretical and empirical literature reviews, the following conceptual framework of the study is developed by the researcher.

Figure: 2. 1. The conceptual framework or model of the study



Source: - Compiled by the researcher mainly based on Talata(2015) and Mutuku (2016)

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

This chapter deals with research design and methodology used to carry out the research. The chapter is organized in eight sub sections. In its first part there is a research design, then after it presented subsequently about research approach, population, sample and sampling technique, data type, sources and instruments, data analysis and model specification. The final two sub parts presented variables selection and hypothesis developments, finally operationalization of study variables are presented.

#### **3.1. Research design**

Cooper et al (2003) discussed that explanatory studies unlike descriptive studies, go beyond observing and describing the condition and tries to explain the reasons of the phenomenon. Thus, explanatory research design were used in this research because the study identifies the cause and effect of NPL factors and profitability on private commercial banks which is appropriate for the objective of the study.

#### **3.2. Research approach**

When conducting a research, there are different ways of approaching the problem. According to Creswell (2009), there are three approaches of research; quantitative, qualitative and mixed. The following discussions briefly presents the basic features of these research approaches. Quantitative research is a means for testing objective theories by examining the relationship among variables (Creswell, 2009). On the other hand, qualitative research approach is a means for exploring and understanding the meaning individuals or groups ascribe to a social or human problem with intent of developing a theory or pattern inductively (Creswell, 2009).

Hence, based on the above discussions of the three research approaches and by considering the research problem and objective, this study used quantitative research approach. Quantitative research is a systematic and scientific investigation of quantitative properties, phenomena's and their relationships by developing and employ mathematical models, theories and hypotheses pertaining to natural and/or social phenomena (Creswell, 2009).

### **3.3. Population of the Study**

The study populations are all private commercial banks in Ethiopia. There are sixteen private commercial banks in Ethiopia; Awash Bank S.C, Dashen Bank S.C, Wegagen Bank S.C, Bank of Abyssinia S.C , Hibret Bank S.C , Nib International Bank S.C ,Cooperative Bank of Oromia S.C, Lion International Bank S.C , Berehan International Bank S.C , Buna International Bank S.C , Oromia International Bank S.C , Zemen Bank S.C , Addis International Bank S.C , Abay Bank S.C, Enat Bank S.C and Debub Global Bank S.C.

### **3.4. Sample and Sampling Techniques**

The total populations of the private commercial banks in Ethiopia are sixteen but for the study purpose the researcher used sample of six private commercial banks in Ethiopia. These banks were selected due to their market share. As NBE (2017/18) annual report stated, these six private commercial banks together accounted for 61% of the market share based on their number of branch and capital held by all Ethiopian private commercial banks.

The study covered a period of 21 (twenty one) years from 2000 G.C - 2020 G.C and include all private commercial banks those who have nineteen and above establishment year. Samples of private commercial banks are Dashen Bank S.C (DB), Awash International Bank S.C (AIB), Wegagen Bank S.C (WB), Hibret Bank Bank S.C (UB), Nib International Bank S.C (NIB) and Bank of Abyssinia S.C (BOA). Hence, the matrix for the frame were  $21 \times 6$  that includes 126 observations.

### **3.5. Data sources and instruments**

In order to carry out any research activity; information should be gathered from proper sources. Since, sufficient data can be obtained from secondary sources which help to achieve the study objective. This study only bases on panel secondary data. Conducting appropriate data gathering instruments support researchers to combine the strengths and amend some of the inadequacies of any source of data to minimize risk of irrelevant conclusion. Consistent and reliable research indicates that research conducted by using appropriate data collection instruments increase the credibility and value of research findings (Koul, 2006). The secondary data were gathered from audited financial statement collected from NBE.

### 3.6. Data analysis

To achieve objective of the study, the study concentrated on quantitative analysis. Hence, the researcher used econometric model to identify and examine the effect of NPL factors on profitability of Ethiopian private commercial banks and used Ordinary Least Square (OLS) method using Eviews-8 econometric software package for the study. According to Brooks (2008) regression is concerned with describing and evaluating the relationship between a given variable (usually called the dependent variable) and one or more other variables (usually known as the independent variables. Thus, the researcher adopted panel data regression model to examine the effect of NPL factors on profitability of Ethiopian private commercial banks.

As stated by Brooks (2008) panel data is favored for situation often arises in financial modeling where we have data comprising both time series and cross-sectional elements. In addition, we can address a broader range of issues and tackle more complex problems with panel data than would be possible with pure time-series or pure cross-sectional data alone. Accordingly, the study model focused on panel data technique that comprises both cross-sectional elements and time-series elements; the cross-sectional element is reflected by the different Ethiopian private commercial banks companies (six) and the time-series element is revealed by the period of study (2000 G.C - 2020G.C). Therefore, the collected panel data is analyzed using descriptive statistics, correlations and multiple linear regression analysis. The rational for choosing Ordinary Least Square (OLS) is that, if the Classical Linear Regression Model (CLRM) assumption should true, then the estimators determined by OLS will have a number of desirable properties, and are known as Best Linear Unbiased Estimators (Brooks, 2008). Diagnostic checking is done to test whether the sample is consistent with the following assumptions. According to Brooks (2008), the assumptions of ordinary least squares are:

- I. The errors have zero mean ( $E(u_t) = 0$ )
- II. variance of the errors is constant ( $\text{Var}(u_t) = \sigma^2 < \infty$ )
- III. Covariance between the error terms over time is zero ( $\text{cov}(u_i, u_j) = 0$  for  $i \neq j$ )
- IV. Test for Normality ( $u_t \sim N(0, \sigma^2)$ )
- V. Multicollinearity Test

If all the above assumptions are consistent with the sample, E-view result will be accurate and reliable. The following tests are done in this research to test the above assumptions.

**I. The errors have zero mean ( $E(u_t) = 0$ )**

Relay on Brooks (2008), the first assumption required is that the average value of the errors is zero. In fact, if a constant term is included in the regression equation, this assumption will never be violated.

**II. Variance of the errors is constant ( $\text{Var}(u_t) = \sigma^2 < \infty$ ) (heteroscedasticity)**

According to Brooks (2008), the variance of the errors is constant this is known as the assumption of homoscedasticity. If the errors do not have a constant variance, they are said to be heteroscedastic. If heteroscedasticity occur, the estimators of the ordinary least square method are inefficient and hypothesis testing is no longer reliable or valid as it will underestimate the variances and standard errors. There are several tests to detect the Heteroscedasticity problem, which are Park Test, Glesjer Test, Breusch-Pagan-Goldfrey Test, White's Test and Autoregressive Conditional Heteroscedasticity (ARCH) test. In this study, the popular white test was employed to test for the presence of heteroscedasticity. The hypothesis for the Heteroscedasticity test was formulated as follow;

$H_0$ : There is no Heteroscedasticity problem in the model.

$H_1$ : There is Heteroscedasticity problem in the model.

$\alpha = 0.05$

Decision Rule: Reject  $H_0$  if p-value is less than significance level. Otherwise, do not reject  $H_0$ .

**III. Covariance between the error terms over time is zero ( $\text{cov}(u_i, u_j) = 0$  for  $i \neq j$ ) (Autocorrelation)**

According to Brooks (2008), when the error term for any observation is related to the error term of other observation, it indicates that autocorrelation problem exist in this model. In the case of autocorrelation problem, the estimated parameters can still remain unbiased and consistent, but it is inefficient. The result of T-test, F-test or the confidence interval will become invalid due to the variances of estimators tend to be underestimated

or overestimated. Due to the invalid hypothesis testing, it may lead to misleading results on the significance of parameters in the model. Therefore, the study test for the existence of autocorrelation, the popular Durbin–Watson test and Breusch-Godfrey test were employed.

$H_0$ : There is no autocorrelation problem in the model.

$H_1$ : There is autocorrelation problem in the model.

$\alpha = 0.05$

Decision Rule: Reject  $H_0$  if p-value less than significance level. Otherwise, do not reject  $H_0$ .

#### **IV. Normality ( $ut \sim N(0, \sigma^2)$ )**

As per Brooks (2008) normality tests are used to determine if a data set is well-modeled by a normal distribution. With the normality assumption, ordinary least square estimation can be easily derived and would be much more valid and straight forward. This study used JarqueBera Test (JB test) to find out whether the error term is normally distributed or not. The hypothesis for the normality test was formulated as follow:

$H_0$ : Error term is normally distributed

$H_1$ : Error term is not normally distributed

$\alpha = 0.05$

Decision Rule: Reject  $H_0$  if p-value of JB tests less than significance level. Otherwise, do not reject  $H_0$ .

#### **V. Multicollinearity**

According to Brooks (2008), Multicollinearity will occur when some or all of the independent variables are highly correlated with one another. If the multicollinearity occurs, the regression model is unable to tell which independent variables are influencing the dependent variable. This study used high pair-wise correlation coefficients method to test the presence of multicollinearity problem in a regression model, because it shows the correlation of independent variables between each other one by one Malhotra (2007) stated that multicollinearity problems exists when the correlation coefficient among explanatory variables should be greater than 0.75. However, Brooks (2008) mentioned that if the

correlation coefficient along with the independent variables is 0.8 and above, multicollinearity problems will be existed.

### 3.7. Model specification

According to Brooks (2008), it is very easy to generalize the simple model to one with k regressors (independent variables).  $Y_i = \beta_1 + \beta_2 X_{1i} + \beta_3 X_{2i} + \dots + \beta_k X_{ki} + \epsilon_i$ ,  $i = (1, 2, \dots, i)$ . So, Where  $Y_i$  is the  $i^{\text{th}}$  observation of the dependent variable,  $X_{1i}, \dots, X_{ki}$  are the  $i^{\text{th}}$  observation of the independent variables,  $\beta_0, \dots, \beta_k$  are the regression coefficients,  $\epsilon_i$  is the  $i^{\text{th}}$  observation of the stochastic error term.

Accordingly, to examine the effect of NPL factors on profitability of Ethiopian private commercial banks and the researcher estimated linear regression model in the following form.

$$ROA_{it} = \alpha + \beta_1 NPL_{it} + \beta_2 CIR_{it} + \beta_3 LRR_{it} + \beta_4 BZ_{it} + \beta_5 LR_{it} + \epsilon$$

*Source: - Compiled by the researcher mainly based on Talata (2015) and Mutuku (2016)*

**Where:**

ROA = Profitability

NPL= Nonperforming loan ratio

CIR= cost income ratio

LRR= loan recovery rate

BZ= Bank's size

LR= Liquidity ratio

$\epsilon$  =is the error component for company i at time t assumed to have mean zero  $E[\epsilon_{it}] = 0$

$\alpha$  = Constant

$\beta = 1, 2, 3, 4, \& 5$  are parameters to be estimate;

i = Private commercial banks  $i = 1 \dots 6$ ; and t = the index of time periods and  $t = 1 \dots 19$

### 3.8. Variables description and Hypothesis development

Thus, this section explained the variables used as dependent and independent (explanatory) variables in the study. The definitions and measurements that are used for these variables are

described as follows. In addition to this, hypothesis is also developed that is derived from previous empirical evidences.

## **Dependent variable**

### **Profitability (ROA)**

Profitability accounts for the impact of better financial soundness on bank risk bearing capacity and on their ability to perform liquidity transformation. Most commonly, profitability is measured by return on asset (ROA) and return on equity (ROE). For the purpose of this study, the proxy of profitability is return on asset that measures the overall financial performance of banks and the return on asset (ROA) is measured by the ratio of net profit after tax to total Asset. (Bhalla 2006), in his book, explains ROA as a ratio which is used to measure the company's efficiency in the use of its assets to generate profit. It means that a more efficient company will generate a higher level of profit from a given level of total asset than its less efficient competitor. Finger and Hesse (2009) state that higher bank profits would tend to signal increased bank soundness, which could make it easier for these banks to attract deposits. (Rachmawati and Syamsulhakim, 2004).

## **Independent Variables**

### **Nonperforming loan ratio**

To measure the non-performing loans, the study used the NPL ratio computed as a percentage of non-performing loans to gross loans i.e.  $\text{Gross NPLs} = \text{Gross NPLs} / \text{Gross Loans}$ . According to Achou and Tenguh (2008), NPL ratio has an inverse relationship with banks' profitability. The study also employs cost efficiency as one of the variables. Ahmad and Bashir (2013) argue that low efficiency (high inefficiency) is a signal of bad performance of senior management in running day-to-day activities and loan portfolio. Louzis, Vouldis and Metaxas (2012) submit that if a bank has "bad" management with poor skills in credit scoring, appraisal of pledged collaterals and monitoring borrowers, it is likely to experience an accumulation of NPLs. Banks which devote less effort to ensure higher loan quality will be more cost-efficient (Berger and DeYoung, 1997).

Rely on these evidences, the study hypothesizes NPL has negative and statistically significant effect on profitability.

*H<sub>1</sub>: NPL has negative and statistically significant effect on profitability of Ethiopian private commercial banks.*

## **Control variables**

### **Cost income ratio**

Improved management of operating expenses (lower cost to asset ratio) improves efficiency and eventually leads to higher profits. To measure cost efficiency, the study adopted the view of Athanasoglou et al (2008) who argued that efficient cost (expenses) management is an important determinant of bank profitability. It is usually measured by the ratio of total operating costs to total revenue because only operating expenses can be viewed as the outcome of bank management. I.e. Cost efficiency = Total operating costs/Total revenue.

Based on the above evidences, the study hypothesizes cost income ratio has negative and statistically significant effect on profitability.

*H<sub>2</sub>: Cost income ratio has negative and statistically significant effect on profitability of Ethiopian private commercial banks.*

### **Loan recovery rate**

The loan recovery procedures employed by various commercial banks can contribute to loans default to a greatest extent. Poor loan recovery procedures for example will create a huge portfolio of debt uncollected thus led to loans default and vice versa and the measurement is total repayment divided by total loan amount (Talata, 2015).

As per this facts, the study hypothesizes loan recovery rate has positive and statistically significant effect on profitability.

*H<sub>3</sub>: Loan recovery rate has positive and statistically significant effect on profitability of Ethiopian private commercial banks.*

### **Bank's size**

Among the factors prominently identified as affecting profit variability one is bank size. Evidence indicates that the number and diversity of the ownership of individual deposit

accounts as well as the distribution of deposits by type vary with bank size (George, 1972). Herald and Heiko (2009) founds that although insignificant once controlled by other variables bank size have an effect on profitability.

In most studies of bank performance determinants researchers used banks size as a control variable Michael et al. (2012), Eden (2014). Total asset is used a measure for bank size. Bank size is usually used to account for potential economies or diseconomies of scale in the banking sector Samuel (2015). Size might be an important determinant of bank performance if there are increasing returns to scale in banking. Relay on these evidences, the study hypothesizes bank size has positive and statistically significant effect on profitability

***H<sub>4</sub>: Bank size has positive and statistically significant effect on profitability of Ethiopian private commercial banks.***

### **Loan to deposit ratio**

Managing liquidity is a daily process requiring bankers to monitor and project cash flows to ensure adequate liquidity is maintained. Maintaining a balance between short-term assets and short-term liabilities is critical. For commercial bank, clients' deposits are its primary liabilities, whereas reserves and loans are its primary assets. Bank liquidity can be measured with different liquidity ratio. For the purpose of this study, Total loan and advance to deposit liquidity ratio is used. The ratio serves as a useful planning and control tool in liquidity management since commercial banks use it as a guide in lending and investment decision. Loans & Advances are the major portion of a bank's asset and it is the most earning asset of a bank. This ratio tells us the percentage of funding sources tied up by illiquid asset. It relates illiquid asset with liquid liability. This ratio also indicates the percentage of deposit locked in to illiquid asset. The ratio reflects the proportion of the customers' deposits that has been given out in the form of loans and the percentage that is retained in the liquid forms. As this liquidity ratio decreased, Bank can easily able to respond to their withdrawal needs (Talata, 2015). As per this facts, the study hypothesizes liquidity ratio has positive and statistically significant effect on profitability.

***H<sub>5</sub>: Loan to deposit ratio has positive and statistically significant effect on profitability of Ethiopian private commercial banks.***

### 3.9. Operationalization of study variables

The following table presented the summary of variables, their measurement and expected sign for factors (independent variables) that affect profitability (ROA) (dependent variable) of private commercial banks in Ethiopia.

*Table: 3. 1. Description of variables and their expected relationship*

#### Dependent Variable

Variable	Measurement	Notations	Expected Signs
Profitability	Net profit before tax divided by total assets	ROA	N/A

#### Independent Variables

Variable	Measurement	Notations	Expected Signs
NPL ratio	$NPLs = \frac{\text{Total NPL}}{\text{Total Loan}}$	NPL	-
Cost income ratio	$CIR = \frac{\text{Operating expenses}}{\text{operating income}}$	CIR	-
Loan recovery rate	$LRR = \frac{\text{Total repayment}}{\text{Total loan}}$	LRR	+
Bank's size	Natural log Total asset	BZ	+
Loan to deposit ratio	Total loan divided by total deposit	LDR	+

## CHAPTER FOUR

### DATA ANALYSIS AND PRESENTATION

This chapter deals with the results and analysis of the findings and it contains three sections. The first section presented descriptive and correlation analysis on variables of the study; the second section presented fulfillment of the classical linear regression model (CLRM) assumptions; the third section laid down the results of regression and interview analysis that constitute the main findings of this study.

#### 4.1 Descriptive statistics

Table 4.1 provides a summary of the descriptive statistics of the dependent and independent variables for six banks from the year 2000 to 2020 with a total of 126 observations. The table shows the mean, minimum, maximum, standard deviation and number of observations for the dependent variable firms' performance (ROA) and independent variables (NPL ratio, cost income ratio, loan recovery rate, bank size and loan to deposit ratio).

**Table 4.1 Descriptive statistics**

	<b>ROA</b>	<b>LRR</b>	<b>CIR</b>	<b>NPL</b>	<b>BZ</b>	<b>LDR</b>
<b>Mean</b>	0.049434	0.657371	0.523540	0.208431	21.51668	0.706924
<b>Maximum</b>	0.099780	1.287720	1.166667	0.430270	23.85429	0.999913
<b>Minimum</b>	0.003410	0.203300	0.190722	0.014700	17.79581	0.408820
<b>Std. Dev.</b>	0.024426	0.160323	0.177294	0.117816	0.961129	0.145231
<b>Observations</b>	126	126	126	126	126	126

*Source: - annual report of sample private bank computed using E-views 8*

Table 4.1 presents a summary of the descriptive statistics of the dependent and independent variables for six banks for a period of twenty one (21) years from 2000-2020 with a total of 126 observations. Key figures, including mean, maximum, minimum and standard deviation value were reported. As indicated in the above table, the profitability measured by return on asset shows that sampled of Ethiopian private banks achieved 4.9% on average before tax profit over the last twenty one years from 2000 to 2020. From the total sample, return on asset had a maximum of 9.9% and minimum of 0.341% and the value of return on asset deviate from its mean by 2.44%. As indicated in the above table, the loan recovery rate measured by total repayment divided by total loan shows that sampled of Ethiopian private banks got 65.73% on average over the last twenty one years from 2000 to 2020. From the total sample, the loan recovery rate had a maximum of 128.77% and minimum of 20.33% and the value of return on asset deviate from its mean by 16.03%.

As explained in the above table, the cost income ratio measured by operating expense divided by operating income shows that sampled of Ethiopian private banks got 52.37% on average over the last twenty one years from 2000 to 2020. From the total sample, the cost income ratio had a maximum of 116.67% and minimum of 19.07% and the value of cost income ratio deviate from its mean by 17.72%.

As mentioned in the above table, NPL ratio measured by total NPL divided by total loan shows that sampled of Ethiopian private banks got 20.84% on average over the last twenty one years from 2000 to 2020. From the total sample, the NPL ratio had a maximum of 43.02% and minimum of 1.47% and the value of NPL ratio deviate from its mean by 11.78%.

As indicated in the above table, the bank size measured by natural log of total asset shows that sampled of Ethiopian private banks achieved 21.51 on average over the last twenty one years from 2000 to 2020. From the total sample, bank size had a maximum of 23.85 and minimum of 17.79 and the value of bank size deviate from its mean by 96.11%. As mentioned in the above table, loan to deposit ratio measured by total loan divided by total loan deposit that sampled of Ethiopian private banks got 70.69% on average over the last twenty one years from 2000 to 2020. From the total sample, the loan to deposit ratio had a

maximum of 99.99% and minimum of 40.88% and the value of loan to deposit ratio deviate from its mean by 14.52%.

## 4.2 Correlation Analysis

Correlation measures the degree of linear association between variables. Values of the correlation coefficient are always ranged between +1 and -1. A correlation coefficient of +1 indicates that the existence of a perfect positive association between the two variables, while a correlation coefficient of -1 indicates perfect negative association. A correlation coefficient of zero, on the other hand, indicates the absence of relationship (association) between two variables (Brooks, 2008). The table below shows the correlation matrix among dependent and independent variables.

**Table 4.2 Correlation Analysis of Variables**

	<b>ROA</b>	<b>NPL</b>	<b>CIR</b>	<b>LRR</b>	<b>BZ</b>	<b>LDR</b>
<b>ROA</b>	1.000000					
<b>NPL</b>	-0.050748	1.000000				
<b>CIR</b>	-0.029191	-0.149083	1.000000			
<b>LRR</b>	0.215279	0.037519	0.079130	1.000000		
<b>BZ</b>	0.172512	-0.059644	0.095111	0.158334	1.000000	
<b>LDR</b>	0.079559	-0.002009	0.136591	0.099835	0.182040	1.000000

*Source: - annual report of sample private bank computed using E-views 8*

The correlation result in Table 4.2 shows NPL ratio and cost income ratio have negative correlation with return on asset for measurement of Ethiopian private bank. It refers that when these variables value increases, profitability of Ethiopian private bank will be go down. However, loan recovery rate , bank size and loan to deposit ratio have positive correlation with return on asset which indicates that while these variable value decreases, at the same time profitability of Ethiopian private banks will be decrease.

The coefficient estimates of correlation in the above table shows -0.050748 and -0.029191 for NPL ratio and cost income ratio respectively. This implies that these two variables are correlated negatively. However, loan recovery rate , bank size and loan to deposit ratio have

0.215279, 0.172512 and 0.079559 coefficient values respectively. This implies that these variables are correlated positively with profitability.

### 4.3 Regression model tests

For valid hypothesis testing and to make data available for reliable results, the test of assumption of regression model is required. Accordingly, the study has gone through the most critical regression diagnostic tests consisting of normality, multicollinearity, heteroskedasticity and autocorrelation tests accordingly.

#### 4.3.1 Model Selection (Random Effect versus Fixed Effect Models)

As Brooks (2008) referring on his book, there are broadly two classes of panel estimator approaches that can be employed in financial research: fixed effects models and random effects models. The choice between both approaches is done by running a Hausman test. To conduct a Hausman test the number of cross section should be greater than the number of coefficients to be estimated. Therefore a fixed cross-sectional effect is specified in the estimation so as to capture unobserved idiosyncratic effects of different insurance companies. Thus, to determine whether the fixed effects are necessary or not this study run the Hausman specification test as recommended by Brooks (2008) and others. The hypothesis for the model selection test was formulated as follow;

H<sub>0</sub>: Random effects model is appropriate.

H<sub>1</sub>: Fixed effects model is appropriate.

$\alpha = 0.05$

Decision Rule: Reject H<sub>0</sub> if P value is less than significant level 0.05. Otherwise, do not reject H<sub>0</sub>.

#### Table 4. 3 Hausman Test

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	23.963955	5	0.0002

*Source: - annual report of sample private bank computed using E-views 8*

The Hausman model selection test for this study has a p-value of 0.0002 for the regression models. Thus, the null hypothesis which is random effect model appropriate was rejected and the research used the fixed effect model.

In addition, as stated by 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 fixed effect model and random effect model. Hence the choice here is based on computational convenience. On this score, fixed effect model may be preferable. Therefore, the study has 21 time series and 6 cross sectional which is relevant to fixed effect model.

According to Brooks (2008) it is often said that the random effects model is more appropriate when the entities in the sample can be thought of as having been randomly selected from the population, but a fixed effect model is more reasonable when the entities in the sample effectively represent the entire population. Thus, the sample for this study was not selected randomly instead it selected rationally that can effectively represent the total number of population, due to this it is appropriate for fixed effect model selection.

#### **4.3.2 Tests for the Classical Linear Regression Model (CLRM) assumptions**

To maintain the data validity and robustness of the regressed result of the research, the basic classical linear regression model (CLRM) assumptions must be tested for identifying any misspecification and correcting them so as to augment the research quality (Brooks,2008). There are different CLRM assumptions that need to be satisfied and that are tested in this study, which are: errors equal zero mean test, heteroscedasticity, autocorrelation, normality and multicollinearity.

##### **I. The errors have zero mean ( $E(u_t) = 0$ )**

This part shows the test for the assumptions of classical linear regression model (CLRM) namely the error have zero mean, heteroscedasticity, autocorrelation, normality and multicollinearity.

Relay on Brooks (2008), the first assumption required is that the average value of the errors is zero. In fact, if a constant term is included in the regression equation, this assumption will never be violated. Hence, study's regression model has included a constant term, so that this assumption was not violated.

## II. Test for heteroskedasticity assumption ( $\text{var}(u_t) = \sigma^2 < \infty$ )

As indicated by Brooks (2008), this assumption requires that the variance of the errors to be constant. If the errors do not have a constant variance, it is said that the assumption of homoscedasticity has been violated. This violation is termed as heteroscedasticity. In this study test was used to test for existence of heteroscedasticity across the range of explanatory variables.

$H_0$ : The variance of the error is homoscedasticity

$H_1$ : The variance of the error is heteroscedasticity

### Table 4.4 Heteroskedasticity Test

Heteroskedasticity Test: White

F-statistic	2.084992	Prob. F(5,120)	0.0719
Obs*R-squared	10.07127	Prob. Chi-Square(5)	0.0732
Scaled explained SS	5.921822	Prob. Chi-Square(5)	0.3139

*Source: - annual report of sample private bank computed using E-views 8*

In this case, both the F- statistic and R-squared versions of the test statistic give the same conclusion that there is no evidence for the presence of heteroscedasticity, since the p-values are considerably in excess of 0.05 and also the third version of the test statistic, ‘Scaled explained SS’, which as the name suggests is based on a normalised version of the explained sum of squares from the auxiliary regression, suggests also that there is no evidence of heteroscedasticity. Thus, the conclusion of the test has shown that no evidence of heteroscedasticity and the null hypothesis is accepted.

## III. Test for autocorrelation assumption ( $\text{cov}(u_i, u_j) = 0$ for $i \neq j$ )

This assumption stated that the covariance between the error terms over time (or cross sectionals, for that type of data) is zero. In other words, it is assumed that the errors are uncorrelated with one another. If the errors are not uncorrelated with one another, it would be stated that they are auto correlated or that they are serially correlated (Brooks, 2008).

The study used both Durbin-Watson (DW) and Breusch-Godfrey test for the existence of autocorrelation. In addition, lagged value of a variable (ROA (-1)) is used in this research in order to adjust the autocorrelation. As per Brooks (2008) lagged the value is simply the value that the variable took during a previous period. So from the regression result DW is 1.746 it is closed to two.

**Table 4.5 Breusch-Godfrey Serial Correlation LM Test**

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.158584	Prob. F(2,116)	0.8535
Obs*R-squared	0.340845	Prob. Chi-Square(2)	0.8433

*Source: - annual report of sample private bank computed using E-views 8*

Both versions of the test; F- statistic and R-squared version of the test indicate that the null hypothesis of no autocorrelation should not be rejected, since the p-values are considerably in excess of 0.05. The conclusion from both versions of the test described that the null hypothesis of no autocorrelation is not rejected.

#### **IV. Test of normality (ut ~N(0, σ<sup>2</sup>))**

As stated by Brooks (2008), if the residuals are normally distributed, the histogram should be bell-shaped and the Bera-Jarque statistic would be significant. This means that Jarque Bera formalizes this by testing the residuals for normality and testing whether the coefficient of skewness and kurtosis are  $\approx 0$  and  $\approx 3$  respectively. Normality assumption of the regression model can be tested with the Jarque- Bera measure. Skewness measures the extent to which a distribution is not symmetric about its mean value and kurtosis measures how it is fat the tails of the distribution. If the Jarque Bera value is greater than 0.05, it's an indicator for the presence of normality (Brooks, 2008).

In addition, it is quite often the case that one or two very extreme residuals cause a rejection of the normality assumption. Such observations would appear in the tails of the distribution,

which enters into the definition of kurtosis, to be very large. Such observations that do not fit in with the pattern of the remainder of the data are known as outliers.

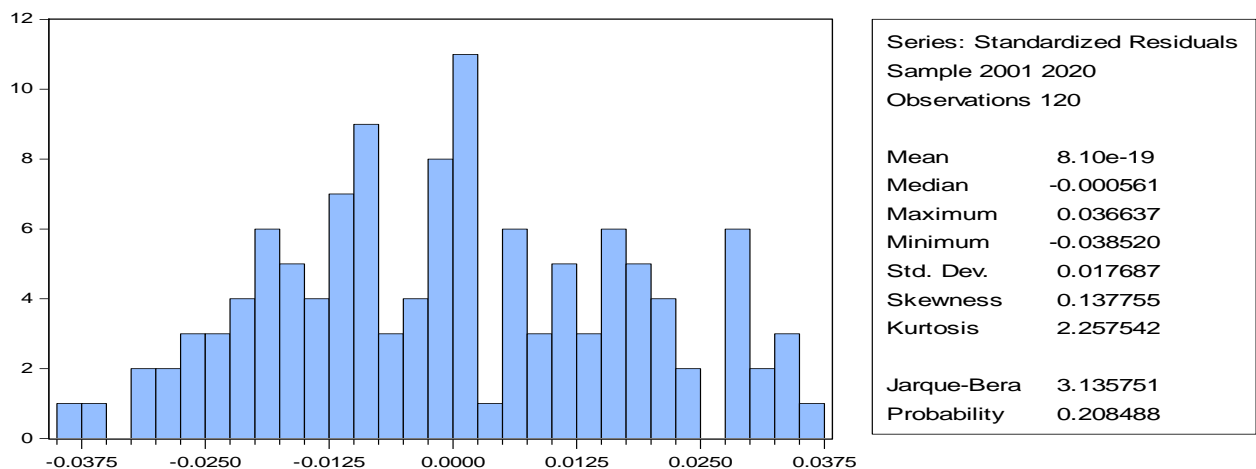
If this is the case, one way to improve the chances of error normality is to use dummy variables (Brooks, 2008). In line with this, the study included four dummy variables (DUM303,DUM120,DUM306 and DUM508) to adjust the normality distribution. Thus, the figure below shows the result of normality by including four dummy variables.

The hypothesis for the normality test was formulated as follow:

$H_0$ : Error term is normally distributed

$H_1$ : Error term is not normally distributed

**Figure 4.1 Normality Test Result**



*Source: - annual report of sample private bank computed using E-views 8*

The above diagram witnesses that normality assumption holds, i.e., the coefficient of kurtosis was close to 3, skewness was zero and the Bera-Jarque statistic has a P-value of 0.208488 implying that the data were consistent with a normal distribution assumption. Based on the statistical result, the study failed to reject the null hypothesis of normality at the 5% significance level.

## V. Test for multicollinearity

As referred by Brooks (2008), an implicit assumption that is made when using the OLS estimation method is that the explanatory variables are not correlated with one another. If there is no relationship between the explanatory variables, they would be said to be

orthogonal to one another. However, a problem occurs when the explanatory variables are very highly correlated with each other, and this problem is known as multicollinearity.

Malhotra (2007) stated that multicollinearity problems exists when the correlation coefficient among explanatory variables should be greater than 0.75. However, Brooks (2008) mentioned that if the correlation coefficient along with the independent variables is 0.8 and above, multicollinearity problems will be existed.

**Table 4.6 Correlation Matrix between independent variables**

	<b>NPL</b>	<b>CIR</b>	<b>LRR</b>	<b>BZ</b>	<b>LDR</b>
<b>NPL</b>	1.000000				
<b>CIR</b>	-0.149083	1.000000			
<b>LRR</b>	0.037519	0.079130	1.000000		
<b>BZ</b>	-0.059644	0.095111	0.158334	1.000000	
<b>LDR</b>	-0.002009	0.136591	0.099835	0.182040	1.000000

*Source: - annual report of sample private bank computed using E-views 8*

The method used in this study to test the existence of multicollinearity was by checking the Pearson correlation between the independent variables. The correlations between the independent variables are shown in table 4.6 above. All correlation results are below 0.75, which indicates that multicollinearity is not a problem for this study.

#### **4.4 Analysis of regression result**

This section presents the empirical findings from the econometric output to examine the effect of NPL factors on profitability of Ethiopian private commercial banks. Table 4.7 below reports regression results between the dependent variable (ROA) and explanatory variables. Under the following regression outputs the beta coefficient may be negative or positive; beta indicates that each variable’s level of influence on the dependent variable.

##### **Regression result**

**Empirical model:** the empirical model used in the study in order to examine the effect of NPL factors on profitability of Ethiopian private commercial banks.

$$ROA_{it} = \alpha + \beta_1 NPL_{it} + \beta_2 CIR_{it} + \beta_3 LRR_{it} + \beta_4 BZ_{it} + \beta_5 LDR_{it} + \varepsilon$$

## Table 4.7 Regression result

Dependent Variable: ROA  
 Method: Panel Least Squares  
 Date: 03/23/22 Time: 19:10  
 Sample (adjusted): 2001 2020  
 Periods included: 20  
 Cross-sections included: 6  
 Total panel (balanced) observations: 120

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.087971	0.042782	-2.056254	0.0423
NPL	-0.028571	0.012787	-2.234326	0.0276*
CIR	-0.000924	0.010710	-0.086289	0.9314
LRR	0.041625	0.016650	2.500081	0.0140*
BZ	0.006553	0.001963	3.337588	0.0012**
LDR	-0.000127	0.012460	-0.010224	0.9919
ROA(-1)	0.138994	0.080410	1.728558	0.0869
DUM303	-0.056878	0.019826	-2.868882	0.0050
DUM120	-0.053456	0.019692	-2.714621	0.0078
DUM306	0.050095	0.020450	2.449608	0.0160
DUM508	0.044641	0.020109	2.219910	0.0286

Effects Specification

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Cross-section fixed (dummy variables)

R-squared	0.420124	Mean dependent var	0.048972
Adjusted R-squared	0.336488	S.D. dependent var	0.023227
S.E. of regression	0.018920	Akaike info criterion	-4.973637
Sum squared resid	0.037228	Schwarz criterion	-4.601971
Log likelihood	314.4182	Hannan-Quinn criter.	-4.822701
F-statistic	5.023241	Durbin-Watson stat	1.746388
Prob(F-statistic)	0.000000		

*Source: - annual report of sample private bank computed using E-views 8*

**N.B:- \*\*and \* indicate that significant at 1% and 5% significance level respectively**

Thus, based on the result in above Table, the following model was developed to examine the effect of NPL factors on profitability of Ethiopian private commercial banks.

$$ROA = - 0.087971 - 0.028571NPL - 0.000924CIR + 0.041625LRR + 0.006553BZ - 0.000127 + \varepsilon$$

This section discusses in detail the analysis of the results for each explanatory variable and their effect on Ethiopian private bank's profitability. Furthermore, the discussion analyzed the statistical findings of the study in relation to the previous empirical evidences. Hence, the following discussions present the interpretation on the fixed effects model regression results.

P-value indicates at what percentage or precession level of each variable is significant except cost income ratio and loan to deposit ratio. The R-squared value measures how well the regression model explains the actual variations in the dependent variable (Brooks, 2008). R-squared statistics and the adjusted- R squared statistics of the model was 42.01% and 33.65% respectively. The adjusted  $R^2$  value 33.65% indicates that the dependent variable of return on asset (ROA) of Ethiopian private banks is well explained by the independent variables that are listed in the model. Thus, these variables collectively are good explanatory variables to examine the effect of NPL factors on profitability of Ethiopian private commercial banks. The regression F-statistic (5.023241) and the p-value of zero attached to the test statistic reveal that the null hypothesis that all of the coefficients are jointly zero should be rejected. Thus, it implies that the independent variables in the model were able to explain variations in the dependent variable.

#### **4.4.1 Discussion of Regression Result**

##### **NPL (Non performing loan)**

*H<sub>1</sub>: NPL has negative and statistically significant effect on profitability of Ethiopian private commercial banks*

According to the regression result of NPL (non performing loan) has a negative relationship with ROA by a coefficient estimate of -0.028571. This means that holding other independent variables constant and when one percent increases in NPL (non performing loan), consequently it reduces return on asset (ROA) of Ethiopian private banks by 2.86% and the p value of NPL (non performing loan), is 0.0276 reveals that it is statistically significant at 5% level of significance. Accordingly, the result supports the working hypothesis that NPL has negative and statistically significant effect on profitability of Ethiopian private commercial banks. As implied from the above finding, NPL (non performing loan) is adversely affecting the performance of the Ethiopian private banks during the study period in Ethiopia. Thus, this outcome is consistent with prior study of Achou and Tenguh (2008), Ahmad and Bashir (2013) and Louzis, Vouldis and Metaxas (2012).

### **Cost income ratio (CIR)**

#### ***H<sub>2</sub>: Cost income ratio has negative and statistically significant effect on profitability of Ethiopian private commercial banks***

According to the regression result of cost income ratio (CIR) has a negative relationship with ROA by a coefficient estimate of -0.000924 but it has insignificant effect on ROA. This means that holding other independent variables constant and when one percent increases in cost income ratio (CIR), consequently it didn't reduce return on asset (ROA) of Ethiopian private banks by 0.0924% and the p value of cost income ratio (CIR), is 0.9314 reveals that it is statistically insignificant at 5% level of significance. Accordingly, the result didn't support the working hypothesis that cost income ratio has negative and statistically significant effect on profitability of Ethiopian private commercial banks. As implied from the above finding, cost income ratio has no significant impact on profitability of Ethiopian private commercial banks. Thus, this outcome is contradict with study of Athanasoglou et al (2008).

### **Loan Recovery Rate (LRR)**

#### ***H<sub>3</sub>: Loan recovery rate has positive and statistically significant effect on profitability of Ethiopian private commercial banks***

According to the regression result of LRR (Loan recovery rate) has a positive and significant relationship with ROA by a coefficient estimate of 0.041625. This means that holding other independent variables constant and when one percent increases in LRR (Loan recovery rate), consequently it increases return on asset (ROA) of Ethiopian private banks by 4.16% and the p value of LRR (Loan recovery rate), is 0.0140 reveals that it is statistically significant at 5% level of significance. Accordingly, the result supports the working hypothesis that loan recovery rate has positive and statistically significant effect on profitability of Ethiopian private commercial banks. As implied from the above finding, LRR (Loan recovery rate) is positively affecting the profitability of the Ethiopian private banks during the study period in Ethiopia. Thus, this outcome is consistent with prior study of (Talata, 2015).

### **Bank size (BZ)**

#### ***H<sub>4</sub>: Bank size has positive and statistically significant effect on profitability of Ethiopian private commercial banks***

According to the regression result of BZ (bank size) has a positive and significant relationship with ROA by a coefficient estimate of 0.006553. This means that holding other independent variables constant and when one percent increases in BZ (bank size), consequently it increases return on asset (ROA) of Ethiopian private banks by 0.6553% and the p value of BZ (bank size), is 0.0012 reveals that it is statistically significant at 5% level of significance. Accordingly, the result supports the working hypothesis that bank size has positive and statistically significant effect on profitability of Ethiopian private commercial banks. As implied from the above finding, BZ (bank size) is positively affecting the profitability of the Ethiopian private banks during the study period in Ethiopia. Thus, this outcome is consistent with prior study of Michael et al. (2012), Eden (2014) and Samuel (2015).

### **Loan to deposit ratio**

#### ***H<sub>5</sub>: Loan to deposit ratio has positive and statistically significant effect on profitability of Ethiopian private commercial banks***

According to the regression result of loan to deposit ratio (LDR) has a negative relationship with ROA by a coefficient estimate of -0.000127 but it has insignificant effect on ROA. This means that holding other independent variables constant and when one percent increases in loan to deposit ratio (LDR), consequently it didn't reduces return on asset (ROA) of Ethiopian private banks by 0.0127% and the p value of loan to deposit ratio (LDR) is 0.99919 reveals that it is statistically insignificant at 5% level of significance. Accordingly, the result didn't support the working hypothesis that loan to deposit ratio (LDR) has positive and statistically significant effect on profitability of Ethiopian private commercial banks. As implied from the above finding, loan to deposit ratio (LDR) has on significant impact on profitability of Ethiopian private commercial banks. Thus, this outcome is contradict with study of (Talata, 2015).

**Table 4.8 Comparison of test result with expectation**

Independent Variables	Expected Relationships with ROA	Actual result	Statistical Significance test	Hypothesis Status
NPL (Non performing loan)	-	-	Significant at 5%	Accept
Cost Income ratio	-	-	Insignificant at 5%	Reject
Loan Recovery rate	+	+	Significant at 5%	Accept
Bank Size	+	+	Significant at 1%	Accept
Loan to Deposit ratio	+	-	Insignificant at 5%	Reject

*Source: Compiled by the researcher*

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSION AND RECOMMENDATION**

#### **5.1 Summary of findings**

The preceding chapter presented the results and discussion, while this chapter deals with summary, conclusion and recommendations based on the findings of the study. Accordingly this, chapter is organized into three subsections.

The research general objective was to examine the effect of NPL factors on profitability of Ethiopian private commercial banks. The study used twenty one (21) years period of time from 2000-2020 data from six (6) selected private banks in Ethiopia. It carried out by constructing a balanced panel regression model using OLS and as per the Hausman test, fixed effect model was adopted for secondary data obtained from audited annual report.

The overall result obtained from the regression model indicates that NPL has an effect on profitability of private banks in Ethiopia. The dependent variable used to measure profitability was return on asset and independent variables these are NPL ratio, cost income ratio, loan recovery rate , bank size and loan to deposit ratio in order to attain the objective of the study.

From the regression result, NPL ratio has negative and significant impact on profitability and loan recovery rate and bank size have also positive and significant impact on profitability. However, cost income ratio and loan to deposit ratio have negative and insignificant impact on profitability.

## 5.2 Conclusions

The study specifically examines the effect of NPL factors on profitability of Ethiopian private commercial banks.

- According to the regression result of NPL (non performing loan) has a negative and significant effect on ROA . This means that holding other independent variables constant and when one percent increases in NPL (non performing loan), consequently it reduces return on asset (ROA) of Ethiopian private banks.
- Based on the regression result of cost income ratio (CIR) has a negative relationship with ROA, but it has insignificant effect on ROA. This means that holding other independent variables constant and when one percent increases in cost income ratio (CIR), consequently it didn't reduces return on asset (ROA) of Ethiopian private banks.
- As per to the regression result of LRR (Loan recovery rate) has a positive and significant effect on ROA . This means that holding other independent variables constant and when one percent increases in LRR (Loan recovery rate), consequently it increases return on asset (ROA) of Ethiopian private banks.
- Rely on the regression result of BZ (bank size) has a positive and significant effect on ROA. This means that holding other independent variables constant and when one percent increases in BZ (bank size), consequently it increases return on asset (ROA) of Ethiopian private banks.
- According to the regression result of loan to deposit ratio (LDR) has a negative effect on ROA, but it has insignificant effect on ROA. This means that holding other independent variables constant and when one percent increases in loan to deposit ratio (LDR), consequently it didn't reduces return on asset (ROA) of Ethiopian private banks.

### 5.3 Recommendation

The findings of the study showed that NPL ratio has negative and significant impact on profitability and loan recovery rate and bank size have positive and significant impact on profitability. However, cost income ratio and loan to deposit ratio have negative and in significant impact on profitability. Based on the findings which are obtained from regression analysis, the researcher has drawn the following recommendations.

- The analysis indicated that NPL (non performing loan) has a negative and significant effect on ROA. Thus, Ethiopian private banks have to provide loan with sufficient back up /adequate safety of collateral or security. In addition, the bank must provide loan with sufficient credit history or information of the borrower with the quality and dependability of personal guarantee. By doing so, the bank can minimize the NPL rate.
- The finding shows that cost income ratio (CIR) has a negative relationship with ROA, but it has insignificant effect on ROA. However, Ethiopian private banks have to work aggressively on enhancing their operating income by minimizing the operational expenses in order to increase the company profitability.
- As per to the regression result of LRR (Loan recovery rate) has a positive and significant effect on ROA. Thus, Ethiopian private banks must develop strong loan recovery procedures that can contribute to healthy loans status. Because, strong loan recovery procedures will create a huge portfolio that can be properly collected loans which reduces the rate default loans.
- Rely on the regression result of BZ (bank size) has a positive and significant effect on ROA. Thus, Ethiopian private banks should strongly enhance their total asset to have high return through investing in fixed and current asset that can raise their profit.
- According to the regression result of loan to deposit ratio (LDR) has a negative effect on ROA, but it has insignificant effect on ROA. However, the ratio serves as a useful planning and control tool in liquidity management since commercial banks use it as a guide in lending and investment decision. Loans & Advances are the major portion of a bank's asset and it is the most earning asset of a bank. This ratio tells us the percentage of funding sources tied up by illiquid asset. Hence, the bank should properly optimized the loan portfolio according to their deposit amount.

#### **5.4 Direction for Future Research**

This study only considered the effect of NPL factors on profitability of Ethiopian private commercial banks. However, it is recommended for future researchers to further examine other NPL factors that can affect profitability by incorporating additional bank specific and macro-economic variables.

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# ***APPENDICES***

## Appendix 1:-Descriptive Analysis

	<b>ROA</b>	<b>LRR</b>	<b>CIR</b>	<b>NPL</b>	<b>BZ</b>	<b>LDR</b>
<b>Mean</b>	0.049434	0.657371	0.523540	0.208431	21.51668	0.706924
<b>Median</b>	0.047640	0.647930	0.479134	0.192200	21.43717	0.729314
<b>Maximum</b>	0.099780	1.287720	1.166667	0.430270	23.85429	0.999913
<b>Minimum</b>	0.003410	0.203300	0.190722	0.014700	17.79581	0.408820
<b>Std. Dev.</b>	0.024426	0.160323	0.177294	0.117816	0.961129	0.145231
<b>Skewness</b>	0.186086	0.449009	0.988411	0.245254	-0.318504	-0.207152
<b>Kurtosis</b>	2.079380	3.950215	4.507194	1.851165	3.834099	2.199860
<b>Jarque-Bera</b>	5.176782	8.974057	32.44217	8.192208	5.782886	4.262331
<b>Probability</b>	0.075141	0.011254	0.000000	0.016637	0.055496	0.118699
<b>Sum</b>	6.228730	82.82875	65.96603	26.26231	2711.102	89.07237
<b>Sum Sq. Dev.</b>	0.074581	3.212931	3.929151	1.735084	115.4710	2.636489
<b>Observations</b>	126	126	126	126	126	126

## Appendix 2:-Hausman Test

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	23.963955	5	0.0002

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
NPL	-0.027588	-0.007879	0.000059	0.0105
CIR	-0.005412	-0.001598	0.000012	0.2805
LRR	0.048674	0.040080	0.000041	0.1783
BZ	0.003701	0.003382	0.000000	0.4107
LDR	0.005519	0.006309	0.000008	0.7794

Cross-section random effects test equation:

Dependent Variable: ROA

Method: Panel Least Squares

Date: 03/22/22 Time: 19:56

Sample: 2000 2020

Periods included: 21

Cross-sections included: 6

Total panel (balanced) observations: 126

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.023269	0.047317	-0.491768	0.6238
NPL	-0.027588	0.014804	-1.863579	0.0649
CIR	-0.005412	0.012085	-0.447858	0.6551
LRR	0.048674	0.018422	2.642156	0.0094
BZ	0.003701	0.002179	1.698278	0.0922
LDR	0.005519	0.014412	0.382928	0.7025

### Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.230250	Mean dependent var	0.049434
Adjusted R-squared	0.163315	S.D. dependent var	0.024426
S.E. of regression	0.022343	Akaike info criterion	-4.681361
Sum squared resid	0.057409	Schwarz criterion	-4.433749
Log likelihood	305.9257	Hannan-Quinn criter.	-4.580764
F-statistic	3.439917	Durbin-Watson stat	1.551156
Prob(F-statistic)	0.000563		

### Appendix 3:- Test of Heteroskedasticity

Heteroskedasticity Test: White

F-statistic	2.084992	Prob. F(5,120)	0.0719
Obs*R-squared	10.07127	Prob. Chi-Square(5)	0.0732
Scaled explained SS	5.921822	Prob. Chi-Square(5)	0.3139

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 03/22/22 Time: 20:09

Sample: 1 126

Included observations: 126

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000144	0.000651	0.220646	0.8257
NPL^2	-0.000251	0.000247	-1.012494	0.3133
CIR^2	0.000296	0.000254	1.164031	0.2467
LRR^2	-0.001716	0.001037	-1.654705	0.1006
BZ^2	5.13E-07	1.39E-06	0.370600	0.7116
LDR^2	0.000560	0.000281	1.991071	0.0487
R-squared	0.079931	Mean dependent var		0.000551
Adjusted R-squared	0.041594	S.D. dependent var		0.000629
S.E. of regression	0.000616	Akaike info criterion		-11.89962
Sum squared resid	4.56E-05	Schwarz criterion		-11.76456
Log likelihood	755.6763	Hannan-Quinn criter.		-11.84475
F-statistic	2.084992	Durbin-Watson stat		1.670308
Prob(F-statistic)	0.071899			

## Appendix 4: - Test of autocorrelation

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.158584	Prob. F(2,116)	0.8535
Obs*R-squared	0.340845	Prob. Chi-Square(2)	0.8433

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 03/22/22 Time: 20:15

Sample: 2 126

Included observations: 125

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.004896	0.048325	-0.101307	0.9195
NPL	0.001464	0.013253	0.110494	0.9122
CIR	0.000200	0.011843	0.016848	0.9866
LRR	-0.004275	0.019188	-0.222802	0.8241
BZ	-2.64E-05	0.002185	-0.012076	0.9904
LDR	-0.001826	0.014638	-0.124731	0.9010
ROA(-1)	0.132821	0.250649	0.529909	0.5972
RESID(-1)	-0.153761	0.273250	-0.562713	0.5747
RESID(-2)	-0.041706	0.120937	-0.344859	0.7308

R-squared	0.002727	Mean dependent var	7.94E-18
Adjusted R-squared	-0.066051	S.D. dependent var	0.021816
S.E. of regression	0.022525	Akaike info criterion	-4.679093
Sum squared resid	0.058856	Schwarz criterion	-4.475455
Log likelihood	301.4433	Hannan-Quinn criter.	-4.596365
F-statistic	0.039646	Durbin-Watson stat	1.997011
Prob(F-statistic)	0.999975		

## Appendix 5 :- Raw data used for analysis

BANK	YEAR	ROA	CIR	BZ	LDR	NPL	LRR
Dashen1	2000	0.099	0.630	20.448	0.673	0.303	0.553
1	2001	0.084	1.167	20.626	0.811	0.205	0.646
1	2002	0.070	0.786	20.829	0.590	0.340	0.203
1	2003	0.061	0.741	21.060	0.694	0.251	0.650
1	2004	0.075	0.797	21.294	0.988	0.184	0.508
1	2005	0.078	0.622	21.523	0.879	0.120	0.560
1	2006	0.057	0.377	21.806	0.817	0.096	0.679
1	2007	0.069	0.554	22.066	0.919	0.074	0.705
1	2008	0.030	0.545	22.296	0.982	0.087	0.902
1	2009	0.066	0.442	22.583	0.944	0.058	0.840
1	2010	0.021	0.407	17.796	0.872	0.015	0.626
1	2011	0.088	0.761	23.037	0.718	0.140	0.745
1	2012	0.086	0.486	20.392	0.850	0.042	0.711
1	2013	0.031	0.643	20.613	0.754	0.032	0.604
1	2014	0.051	0.688	20.856	0.662	0.380	0.598
1	2015	0.048	0.446	21.011	0.577	0.284	0.739
1	2016	0.024	0.451	21.184	0.474	0.175	0.467
1	2017	0.034	0.421	21.445	0.439	0.124	0.514
1	2018	0.044	0.458	21.765	0.672	0.049	0.398
1	2019	0.080	0.543	21.946	0.509	0.105	0.586
1	2020	0.011	0.738	22.175	0.901	0.129	0.671
Awash 2	2000	0.003	0.740	22.424	0.750	0.148	0.734
2	2001	0.070	0.639	22.561	0.680	0.070	0.602
2	2002	0.019	0.797	22.708	0.719	0.040	0.807
2	2003	0.035	0.292	20.697	0.801	0.236	0.911
2	2004	0.043	0.302	20.691	0.807	0.344	0.994
2	2005	0.053	0.431	20.680	0.985	0.416	0.881
2	2006	0.048	0.315	20.664	0.626	0.401	0.915
2	2007	0.048	0.431	20.779	0.895	0.355	0.854
2	2008	0.010	0.388	21.329	0.704	0.278	0.853
2	2009	0.068	0.334	21.309	0.946	0.194	0.895
2	2010	0.060	0.626	21.359	0.736	0.171	0.810
2	2011	0.028	0.305	21.595	0.700	0.156	0.517
2	2012	0.035	0.191	21.676	0.810	0.115	0.534
2	2013	0.077	0.334	21.874	0.733	0.066	0.623
2	2014	0.078	0.236	21.977	0.419	0.177	0.596

2	2015	0.033	0.837	20.578	0.785	0.264	0.531
2	2016	0.075	0.733	20.819	0.451	0.338	0.592
2	2017	0.056	0.606	21.119	0.409	0.420	0.660
2	2018	0.060	0.670	21.412	0.441	0.400	0.947
2	2019	0.063	0.508	21.708	0.580	0.377	0.821
2	2020	0.047	0.474	21.953	0.541	0.275	0.815
Wegagen	3 2000	0.100	0.446	22.238	0.800	0.225	0.625
3	2001	0.073	0.571	22.522	0.584	0.303	0.770
3	2002	0.072	0.527	22.781	0.599	0.205	0.661
3	2003	0.025	0.479	22.999	0.742	0.340	0.548
3	2004	0.092	0.421	23.237	0.831	0.251	0.579
3	2005	0.095	0.410	23.408	0.753	0.184	0.568
3	2006	0.097	0.368	18.878	0.751	0.190	0.731
3	2007	0.035	0.321	19.797	0.696	0.096	0.829
3	2008	0.036	0.422	20.096	0.461	0.074	1.288
3	2009	0.047	0.495	20.601	0.508	0.087	0.674
3	2010	0.024	0.433	20.944	0.498	0.058	0.656
3	2011	0.047	0.450	21.273	0.514	0.115	0.723
3	2012	0.062	0.469	21.430	0.549	0.066	0.660
3	2013	0.085	0.496	21.681	0.597	0.177	0.847
3	2014	0.057	0.842	22.018	0.850	0.264	0.767
3	2015	0.046	0.470	22.293	0.712	0.338	0.802
3	2016	0.059	0.520	22.510	0.800	0.420	0.677
3	2017	0.059	0.709	20.329	0.736	0.400	0.728
3	2018	0.074	0.469	20.794	0.649	0.377	0.541
3	2019	0.059	0.473	21.193	0.842	0.275	0.590
3	2020	0.069	0.559	21.504	0.842	0.225	0.700
Hiberet	4 2000	0.094	0.561	21.902	0.762	0.303	0.562
4	2001	0.020	0.504	22.261	0.856	0.205	0.493
4	2002	0.032	0.432	22.498	0.851	0.340	0.405
4	2003	0.030	0.409	22.768	0.854	0.251	0.494
4	2004	0.047	0.502	20.058	0.837	0.184	0.470
4	2005	0.058	0.498	20.184	0.510	0.120	0.590
4	2006	0.052	0.435	20.606	0.585	0.096	0.490
4	2007	0.091	0.630	23.854	1.000	0.430	0.593
4	2008	0.043	1.167	21.203	0.899	0.205	0.524
4	2009	0.053	0.786	21.538	0.478	0.340	0.779
4	2010	0.021	0.741	21.970	0.513	0.251	0.678
4	2011	0.022	0.797	22.140	0.803	0.184	0.709

4	2012	0.038	0.622	22.356	0.697	0.120	0.548
4	2013	0.058	0.377	22.810	0.526	0.096	0.409
4	2014	0.048	0.554	20.680	0.569	0.074	0.461
4	2015	0.026	0.545	20.664	0.510	0.087	0.420
4	2016	0.030	0.442	20.779	0.498	0.058	0.572
4	2017	0.017	0.407	21.329	0.430	0.055	0.485
4	2018	0.010	0.761	21.309	0.437	0.140	0.560
4	2019	0.012	0.486	21.359	0.892	0.042	0.566
4	2020	0.015	0.643	21.595	0.858	0.032	0.546
NIB 5	2000	0.015	0.688	21.676	0.701	0.380	0.753
5	2001	0.039	0.446	21.874	0.728	0.284	0.815
5	2002	0.034	0.451	21.977	0.776	0.175	0.799
5	2003	0.009	0.421	20.578	0.605	0.124	0.972
5	2004	0.025	0.458	20.819	0.700	0.049	0.830
5	2005	0.020	0.543	21.119	0.629	0.105	0.809
5	2006	0.026	0.738	21.412	0.701	0.129	0.715
5	2007	0.088	1.000	23.008	0.818	0.155	0.450
5	2008	0.093	0.639	21.953	0.883	0.070	0.796
5	2009	0.039	0.797	22.238	0.857	0.040	0.730
5	2010	0.053	0.292	22.522	0.591	0.236	0.701
5	2011	0.076	0.302	22.781	0.852	0.344	0.686
5	2012	0.081	0.431	22.999	0.731	0.416	0.597
5	2013	0.072	0.315	23.237	0.724	0.401	0.684
5	2014	0.065	0.431	20.448	0.646	0.355	0.614
5	2015	0.066	0.388	20.626	0.657	0.278	0.775
5	2016	0.048	0.334	20.829	0.735	0.194	0.848
5	2017	0.013	0.626	21.060	0.738	0.171	0.816
5	2018	0.081	0.305	21.294	0.665	0.156	0.508
5	2019	0.040	0.191	21.523	0.548	0.115	0.966
5	2020	0.048	0.334	21.806	0.504	0.066	0.798
BOA 6	2000	0.041	0.236	22.066	0.679	0.177	0.775
6	2001	0.026	0.837	22.296	0.601	0.264	0.584
6	2002	0.077	0.733	22.583	0.790	0.338	0.719
6	2003	0.075	0.606	22.796	0.812	0.420	0.643
6	2004	0.052	0.670	23.037	0.829	0.400	0.544
6	2005	0.023	0.508	20.392	0.809	0.377	0.538
6	2006	0.012	0.474	20.613	0.745	0.275	0.605
6	2007	0.024	0.446	20.856	0.838	0.225	0.496
6	2008	0.018	0.571	21.011	0.835	0.303	0.420

6	2009	0.014	0.527	21.184	0.745	0.205	0.350
6	2010	0.031	0.479	21.902	0.853	0.340	0.671
6	2011	0.033	0.421	22.261	0.849	0.251	0.499
6	2012	0.040	0.410	22.498	0.586	0.184	0.428
6	2013	0.043	0.368	22.768	0.736	0.120	0.557
6	2014	0.055	0.321	20.058	0.638	0.096	0.503
6	2015	0.045	0.422	20.184	0.584	0.074	0.512
6	2016	0.054	0.495	20.606	0.640	0.087	0.531
6	2017	0.080	0.433	20.854	0.741	0.377	0.446
6	2018	0.036	0.432	21.203	0.502	0.275	0.788
6	2019	0.020	0.409	22.498	0.817	0.225	0.876
6	2020	0.053	0.502	20.606	0.736	0.303	0.568