



**WOLKITE UNIVERSITY**

**COLLEGE OF BUSINESS AND ECONOMICS**

**DEPARTMENT OF ACCOUNTING AND FINANCE**

**THE IMPACT OF CREDIT RISK MANAGEMENT ON PROFITABILITY  
OF COMMERCIAL BANKS IN ETHIOPIA**

A RESEARCH PAPER SUBMITTED TO DEPARTMENT OF ACCOUNTING AND  
FINANCE FOR THE PARTIAL FULFILLMENT OF THE REQUIREMENT OF BACHELOR  
OF ART DEGREE IN ACCOUNTING AND FINANCE.

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### Declaration

I, Mohammed Ahmed, have carried out independently a research work on “The impact of credit risk management profitability in commercial banks of Ethiopia .” in partial fulfillment of the requirement of the BA Degree program in Accounting and Finance with the guidance and support of the research advisor.

This study is my own work that has not been submitted for any degree or diploma program in this or any other institution, and that all references materials contained therein have been duly acknowledged.

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Signature-----

Signature.....

## Acknowledgement

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## ACRONYMS

CAR-Capital Adequacy Ratio

DAR-Deposit to Asset Ratio

LAR-Loan to Asset Ratio

LLPR-Loan Loss Provision Ratio

NBE-National Bank of Ethiopia

NPL- Non-Performing Loans

ROA-Return on Asset

ROE-Return on Equity

## Abstract

*The importance of strong credit risk management for building quality loan portfolio is of Paramount importance to robust performance of commercial banks as well as overall economy. Since a large chunk of banks revenue accrues from loans from which interest is derived, managing credit risk plays important role for their profitability. As a result, the author is motivated to do research entitled with "Impact of Credit Risk Management on Profitability of Commercial Banks in Ethiopia" basing that there is a gap will currently research papers will done on the topic in terms of variables assumed as well as a new directives will issued by Commercial Bank of Ethiopia (the Central Bank in Ethiopia) after the research papers. Accordingly, the objective of the paper will to examine the impact of credit risk management on profitability of commercial banks in Ethiopia. in order to identify relationship between independent variables (Loan Loss Provision to Total Loan, Loan to Total Asset, Liquid Asset to Total Asset) and dependent variable (Return on Asset). Ten consecutive years audited financial statement used as a secondary data covering 2008-2017 year.*

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# CHAPTER ONE

## INTRODUCTION

Introduction part of study will focus on the whole picture of research gap mainly include background of the study, statement of problem, objective, hypothesis, limitation and significance of the study.

### 1.1 Background of the study

Commercial banks had and still have an important role in the economy. Their central role is to make the

community's surplus of deposits and investments useful by lending it to people for various investment purposes: company growth, education & houses. They are firms that efficiently provide a wide range of financial services for profit. Among the different functions, lending function is the core product line of commercial banks which contributes the major share of revenue to their profitability. But their functionality is not without risk. Currently, the main income of the banking system comes from the credit facility availed to customers and hence exposes them to high credit risk which intern lead them to loss.

As a result, the need to employ a sound credit risk management system is crucial in order to achieve their objective. According to Ghosh & Islam (2014), Credit Risk Management holds a positive relationship with credit monitoring, reliability and assurance factors. All these factors play vital role in the mitigation process of credit risks. Credit Risk Management can be treated as the heart of any Commercial Bank because it plays the vital role in the performance of a financial institution by analyzing credit worth ability of borrowers. Poor Credit Risk Management is the main consideration in case of Banks' unsatisfactory performance and often the reason of bankruptcy. Among the variables that affect their performance negatively, impact of nonperforming loans and loan loss provisioning are the major ones while having adequate amount of capital, having sufficient deposit & liquid asset as well as amount of loans and advances are the ones that affect their performances positively where the study tries to focus on with the exception of the non-performing loans. In the problematic areas of the current topic, a number of researchers were done but only limited of them are in Ethiopia as is described below:

Tefera (2011) revealed that credit risk management has significant impact on profitability of banks in Ethiopia. Kaaya & Pastory (2013) have made research entitled with credit risk and commercial banks performance in Tanzania. The researchers will be the simple random regression model fixing credit risk indicators; Loan loss to gross loan, non-performing loan, loan loss to net loan and impaired loan to gross loan as independent variables while profit indicator; ROA as a dependent variable. Their empirical result showed that the credit risk variables were negatively correlated with the performance indicators showing that the credit risk variables have reduced the performances of the performances of commercial banks during the study period.

The major objective of the research will be to analyze the impact of credit risk management on the profitability of commercial banks in Ethiopia considering that there was a gap while the currently researched will be done in Ethiopia in selecting the variables that will affect profitability as well as new directives. Accordingly, the study will start by reviewing related literatures where theoretical review and empirical reviews will be the two major parts which will be helpful for clarifying the variables that were affected by the profitability of the banks collecting a ten-year audited financial statements from the commercial banks of Ethiopia ranging from 2008 to 2017. Simple linear model regression analysis will select five independent variables and one dependent variable showing that a credit risk management will have a major impact on the profitability of commercial banks.

## **1.2 Statement of the Problem**

One of the major roles of banks is to offer loans to borrowers and loans serve as one of the ultimate sources of earnings for commercial banks. In other words, loans represent one of the highest yielding assets on banks' balance sheets (Bentum, 2012). The development and establishment of a system for credit risk management is extremely important from the viewpoint of ensuring the soundness and appropriateness of a financial institution's business. Failure to establish a sound credit risk management results in a reduction in their performance as well as bankruptcy of financial institutions. Performances of commercial banks can be reflected on profitability where it is an important factor for the smooth running of any business in today's competitive setting and it will have a significant impact on the performance of the institutions, as the financial proficiency of banks can also influence the economic development (Tariq, 2014). The main aim of every banking institution is to operate profitably in order to maintain its stability and

improve in growth and expansion (Aduda and Gitonga, 20110). The topic of the research is impact of credit risk management on profitability of commercial banks in Ethiopia. The finding of credit risk management were a significant impact on the profitability of the commercial banks. Together with the NPL & CAR which were used as a credit risk variables, the current study were used liquidity ratio, size of deposit and deposit to asset ratio which has an impact on profitability of the commercial banks in Ethiopia. Moreover, there are many writers who argue on return on asset is better in order to measure profitability of commercial banks as it is a useful devise for comparing profitability of commercial banks in the same industry.

Mekasha (2011) examine credit risk management and its impact on performances of Commercial Banks in Ethiopia considering return on asset as performance measurement and four independent variables (non-performing loans, loan loss provision ratios, Loan Provision to total asset, non-performing loan to total loan & loan provision to non-performing loan) as credit risk measurement. The cap

ital adequacy and liquidity ratios having significant impact on profitability of the commercial banks the study. The research will attempt to fill the gap and contribute to the impact of credit risk management profitability in commercial banks of Ethiopia. Identify this research will address the following research question, based on the above state problem the study will focus on the following research question.

1. What is the effect of liquid asset to total asset return on Asset in commercial bank of Ethiopia?
2. What is the effect of capital asset ratio return on asset in commercial bank of Ethiopia?
3. What is the effect of dposit asset ratio return on asset in commercial bank of Ethiopia?
4. What is the effect of total loans to advance return on asset in commercial bank of Ethiopia?
5. What is the effect of non performing loans return on asset in commercial bank of Ethiopia?

### **1.3. Hypothesis of the study**

H1. There is a positive and significant relationship between capital asset ratio and credit risk on profitability of commercial bank in Ethiopia.

H2. There is positive and significant relationship between total loans and advance and credit risk on profitability of commercial bank in Ethiopia.

H3. There is a positive and significant relationship between liquid asset to total asset ratio and credit risk on profitability of commercial bank in Ethiopia.

H4. There is a positive and significant relationship between total loans to loan provision ratio and credit risk on profitability of commercial bank in Ethiopia.

H5. There is a negative and significant relationship between deposit asset ratio and credit risk on profitability of commercial bank in Ethiopia.

## **1.4 Objectives of the Study**

Basing the research problems and research questions, the research intends to achieve the following objectives

### **1.4.1. General Objective**

To analyze the impact of credit risk management on the profitability of commercial banks in Ethiopia.

### **1.4.2. Specific objective**

Specific objective of study were

1. To examine the effect of non-performing loans on profitability of commercial banks in Ethiopia.
2. To examine the effect of loans and advances on banks profitability in Ethiopia
3. To examine the effect of loans and provision to non-performing loans on profitability of banks in Ethiopia.
4. To determine whether bank capital contributes to profitability in commercial banks of Ethiopia.
5. To examine the effect of deposit liquid asset to profitability in commercial banks of Ethiopia.

## **1.5 Significance of the Study**

**A.** The study is useful as a base or reference in order to make further research on the topic

**B.** The research is helpful for bank employees especially managers in enabling them on which variables to focus to improve the profitability of their bank.

**C.** Depending upon the research results, a new regulation may be established by the regulatory body and the bank managers may revise the credit policy and procedures of their bank

## **1.6. Scope of the Study**

In pursuance of objective study the research focuses the impact of credit risk management on the profitability of commercial bank in Ethiopia.

The variable were determine the following research variable. Thus research were collected: liquid asset of total asset, loan of total asset, total of depot exposure and loan loss provision total asset.

## **1.7. Limitation of the Study**

Among the credit risk indicator variables of commercial banks, non-performing loan is the major one. Accordingly, the author of the study has maximum effort to include in the current model as one independent variable.

## **1.8. Organization of the Research Report**

The first part (Chapter one) includes introduction, problem statement, guiding questions, objectives and limitations, Scope and significance of the study. The introduction part of the research presented the whole body of the research paper.

The second part (Chapter two) deals with the theoretical and empirical background of the study. The theoretical part was theories of credit risk management and profit obtained from different articles as well as books while the empirical part is the empirical results of researchers made on similar topic. The third chapter will focus on research methodology .Chaptre four about result data presentation and disscussion starting analaysis were interpreting Final part of this chaptr five about conclusion and recommendation.

## **CHAPTER TWO:**

### **LITERATURE REVIEW**

#### **Introduction**

Review of Related Literature In this section, theoretical as well as Empirical reviews will be discussed. Under the theoretical review; theories of credit risk and its management techniques, the dependent and independent variables will be discussed together with the credit risk management guideline obtained from CBE. In the Empirical review part, what results did researchers obtain on the impacts of credit risk management on profits of commercial banks? What methods as well as variables will be utilized in order to arrive at their conclusion? Will be discussed.

#### **2.1 Theoretical Review**

##### **2.1.1 Introduction**

Poudel (2012) revealed that the health of the financial system has an important role in the country as its failure can disrupt economic development of the country. But there are cases where loans are not returned back on time and hence credit risk will arise-the biggest risk commercial banks face. It maximizes bank risk, adjusted risk rate of return by maintaining credit risk exposure with a view to shielding the bank from the adverse effects of credit risk. Sound credit risk management involves prudently managing the risk/reward relationship and controlling and minimizing credit risks across a variety of dimensions (Bank of Jamaica, 1996). A credit facility is said to be performing if payment of both principal and interest are up to date in accordance with agreed repayment terms (Charles & Keneth, 2013). Failure to manage credit risk will create an instability and hence impacts negatively on the survival of banking institutions because a profitable banking sector is better able to withstand negative shocks and contribute to the stability of the financial system (Almumani, 2013). Most researchers explored that, in analyzing the relationship between profitability of commercial banks and credit risk management; Return on asset and Return on Equity will be used as a profitable variable while non-performing loan to total loan and advances, Loan loss provisioning to total loan, size of deposit, total loan and advances to total asset, Total loans & advances to total asset and capital to total asset were used as a measure of credit risk.

### **2.1.2.1 Credit Risk Management Guideline**

CBE will be revised the risk management frame work that will issued in 2003 in order to incorporate latest developments in the areas of Credit risk management, Liquidity risk management, Market risk management and Operational risk management expecting that it will provide minimum risk management standards for all banks operating in Ethiopia as well as assist risk based supervision contributing towards safety and soundness the banking system. Accordingly, as the guidelines are important as well as directly related to the research topic, the credit risk management part is presented in a summarized way. The guideline also in forces all banks operating in Ethiopia to establish credit risk management structure concentrating on risk management functions expecting them to report directly to the board/its risk management committee independently will be the risk management program is acceptable to CBE.

The program should contain to the minimum of:

Active board and senior management oversight;

Adequate policies, procedures and limits;

### **2.1.2.2 Board and Senior Management Oversight**

#### **Board Responsibilities**

The guideline indicates that the board of directors is responsible for reviewing and approving a bank's credit risk strategy and policies will each bank should develop a strategy that sets the objectives of its credit-granting activities and adopts the necessary policies and procedures for conducting such activates.

#### **Management Responsibility**

Senior management has the responsibility for implementing the credit risk strategy approved by the board of directors and for developing policies and procedures for identifying, measuring, monitoring and controlling credit risk. Such policies and procedures should address credit risk in all of the bank's activities at both the individual credit and portfolio levels. They must also insure that there is a periodic independent internal or external assessment of the bank's credit management functions.

### **2.1.2.3 Policies, Procedures and Limits**

The process of credit risk management is formalized in most organizations in a set of procedures generally called a credit policy manual. The foundation for effective credit risk management is the identification of existing and potential risks in the bank's credit products and credit activities.

### **2.1.2.4 Credit Limits and Concentration**

To ensure diversification, exposure limits are needed in all areas of the bank's activities that involve credit risk. Banks establish credit limits for individual counterparties and groups of connected counterparties that aggregate different types of on and off balance sheet exposures. Such limits are frequently based on internal risk ratings that allow higher exposure limits for counterparties with higher ratings.

### **2.1.2.5 Credit Risk Mitigation**

CBE states that there are a number of risk management techniques among which Collateral and Guarantee are the most common ones. Notwithstanding the use of various mitigation techniques individual credits transactions should be entered into primarily on the strength of the borrower's repayment capacity. Banks should also be mindful that the value of collateral might well be impaired by the same factors that have led to the diminished recoverability of the credit.

### **Managing problem must have loans**

Banks a system in place for early remedial action on deteriorating credits, managing problem credits and similar workout situations as one of the reasons for establishing a systematic credit review process is to identify weakened or problem credits. A reduction in credit quality should be recognized at an early stage when there may be more options available for improving the credit. Banks must have disciplined and vigorous remedial management process, triggered by specific events, that are administered through the credit administration and problem recognition systems.

### **2.1.2.6 Credit Risk**

Credit risk is by far the most significant risk faced by banks and the success of their business depends on accurate measurement and efficient management of this risk to a greater extent than any other risks ( Funso et al.,2012). Credit risk, or the risk that money owed is not repaid, has been prevalent in banking history as it is a principal and perhaps the most important risk type that has been present in finance, commerce and trade transactions from ancient cultures till today

(Gestel & Baesens, 2009). It is the risk of loss of principal or loss of a financial reward arising from a borrower's failure to repay a loan or otherwise meet a contractual obligation.

As per Van Gestel and Baesens (2009) states, there can be many reasons for a default:

In most cases, the obligor(s) is in a financially stressed situation and may be facing a bankruptcy procedure.

The borrower can also refuse to comply with its debt service obligation.

Technical defaults result from a misunderstanding because of the flow in the information system or technology.

### **Characteristics of Credit Risk**

According to Brown & Mole (2012), there are three characteristics that define credit risk:

**Exposure** -to a party that may possibly default or suffer an adverse change in its ability to perform

**The likelihood that this party will default or the default** probability on its obligations

**The recovery rate.** That is, how much can be retrieved if a default takes place.

Among the three characteristics, the larger the exposure and probability default will result in the larger the credit risk but the larger in the recovery rate means the lower will be the risk. Given the above, credit risk management is the process of controlling the potential consequences of credit risk. As a result, credit risk can be expressed formally as:  $\text{Credit Risk} = \text{Exposure} * \text{Probability of default} * (1 \text{ less recovery rate})$ . This show that how much controlling of credit risk is very important.

#### **2.1.2.7 Factors of Credit Risk**

Gestel & Baesens, (2009) has classified factors of credit risk in to three: Default risk, Loss risk and Exposure risk with the following description:

##### **Default risk**

The default risk is the probability that a default event occurs. This probability is called the probability of default (PD). The probability has values between 0 and 1. There are many definitions of a default event.

**Loss of risk**

The amount of the loss there is default, expressed as percentage exposure at the time of default. The loss risk determine the loss as fraction of exposure in case of default.in case of no loss.

**Exposure risk**

The exposure value of the loan at the time of default. The exposure at time of default (EAD) may not be known beforehand. For same product like bond or straight loan, the amount is fixed amount. Uncertainty on exact amount at risk at the very moment of future default is exposure risk (Gestel andBaesens, 2009).

**2.1.2.8 Credit Risk Management:**

Banking operations are exposed to some inherent risks including borrower's outright default and unwillingness or inability to meet credit commitment.

According to Gestel & Baesens (2009), credit risk management is a process that involves the identification of potential risks, the measurement of these risks, the appropriate treatment, and the actual implementation of risk models. It holds a positive relationship with credit monitoring, reliability and assurance factors (Ghosh et al., 2014).

**2.1.2.9 Credit Risk Management Techniques**

Gestel & Baesens (2009) as well as Browns & Moles (2012) has identified different types of controlling techniques of credit risk before as well as after granting the loan. Gestel & Baesens (2009) has classified them in to four (selection, Limitation, Diversification & Credit enhancement) while Browns & Moles (2012) has classified credit risk controlling in to four (seiections, Diversification, Covenants, and finally as loan loss provisioning).

**1.Selection:**

A good credit risk management starts with a good selection of the counterparts and products. For the selection strategy to be effective, the models that are used for assessment has to be good together with availing qualified risk officers. In order to reduce the recovery risk, more collateral will be requested for those counterparty with high default risk.

## **2.Diversification**

This type of management technique allows granting different types of products to different industry sector, International as well as geography. Diversification techniques will spread the risk over the larger products rather than concentrating in a single product type as risk diversification is a concept of modern banking. The outcome of a single loan is default or no default, possibly a high loss.

## **3.Covenants and Monitoring**

A covenant is a restriction or requirement imposed on the borrower to the terms of contract. These conditions include to have a minimum level of liquid asset (working capital) and to maintain the quality of assets pledged as collateral in the facility. This will enable the financial institution to take action and trigger the appropriate recovery processes at the same time it enables them to accelerate repayment in case of breaching the conditions.

## **4.Loan Loss Provisioning**

A common practice among financial institutions engaged in lending is to provision against expected losses. The provision of loan losses reserves is a mechanism used by such lenders to recognize in a timely fashion impending losses on troubled loans. The fact that a certain proportion of credits will default is acknowledged and accepted by financial institutions, Commercial Corporation would have a reserve for expected bad debts.

### **2.1.3 Relationship between Credit Risk & Banks Performances**

Banks are relevant to economic development through the financial services they provide. Their intermediation role can be said to be a catalyst for economic growth. The credit function of banks enhances the ability of investors to exploit desired profitable ventures. Credit creation is the main income generating activity of banks; activities like trading, investment and banking, however, it exposes them to credit risk. Credit risk plays an important role on banks' profitability since a large chunk of banks' revenue accrues from loans from which interest is derived (Funso et al., 2012). This implies that there is a significant relationship between bank performance (in terms of return on asset) and credit risk management (in terms of loan performance). Better credit risk management results in better bank performance. Thus, it is of crucial importance that banks practice prudent credit risk management and safeguarding the assets of the banks and protect the investors' interests.

### 2.1.4 Profitability of Commercial Banks

As the topic of the research will be the impact of credit risk management on profitability of commercial banks, clear explanation for the need of profitability is important in order to understand the relationship between credit risk and profitability. Financial sector plays a pivotal role in bringing sustainable economic growth & development (Javaid, 2011). In order to do so, banking system must be profitable as it is the most significant and consistent indicator for the smooth running of any business in today's competitive setting and has a significance impact on performance positively (Tariq, 2014). Profitability in commercial banks is determined by the ability of the banks to retain capital, absorb loan losses, support future growth of assets and provide return to investors (Bank of Tanzania, 2007). It is also an indicator of banks' capacity to carry risk and/or increase their capital (Li & Zou, 2014).

### 2.1.5 Determinants of Bank Profitability

In banking, the determinants of profitability are well observed and explored as it is increasingly important to strengthen the foundations of domestic financial system as a way to build up flexibility for capital flow volatility. The determinants on commercial bank profitability have been studied by different authors where they classify them in two major factors:

**Internal Factors:** Those factors are internal to the firm where they are related to managerial decisions and policy objectives to be achieved by the management. Internal factors are also called Micro or bank specific determinants.

**External Factors:** are those factors that are out of the control of the management and hence environmental. They are affected by industry related macroeconomic variables like GDP, financial market structure, trade interdependence, Economic growth, inflation and market interest rate and ownership structure (Li & Zou, 2014), (Almumani, 2013), (Frederic, 2014), (Ani et al., 2012) & (Lartey et al., 2013).

Together with the above authors, Belete (2013) while he was examining the asset liability management and commercial banks profitability in Ethiopia, he states that the internal factors encompasses asset liability management culture of the bank and external determinants reflect the economic and legal environment that affect the operation and performances of the bank. With this he stated that asset liability management plays a dynamic role with regard to microeconomic determinants of commercial banks profitability.

### **2.1.6 Indicators of Profitability of Commercial Banks**

As an indicator of commercial banks profitability measurement, many writers focus on ROA & ROE as major indicators of profitability of commercial banks and hence they are described below:

#### **Return on Equity (ROE) The ROE**

is an important indicator of how efficiently bank capital is used. Its level is a subject of interest of shareholders, since it expresses the rate of return on the capital invested by them. Return on equity directly reflects corporate competitiveness strength and sustainable growth. It is an important indicator in the attractiveness of the equity in the eyes of investors. ROE measures the amount of net income after taxes earned for each dollar of equity capital contributed by the bank's shareholders. As per Gestel & Baesens (2008), ROE can be calculated by:

$$\text{ROE} = \text{profit after tax} / \text{own capital}$$

In order to identify the problem, it can be decomposed into the following parts:

$$\text{ROE} = \text{Net income} / \text{total asset} * \text{Total asset} / \text{Total equity capital}$$

#### **Return on asset (ROA):**

As per Charles & Kenneth (2013) states that ROA is one of the measures of financial performances of commercial banks. Return on Asset effectively reflects corporate profitability which can be used to evaluate the performance of management in the utilization of the assets. This intend to measure bank efficiency using its asset. It measures how efficiently management is using its total assets (as reported on the balance sheet) to generate profits (as measured by net income on the income statement). It helps investors measure how management is using its assets or resources to generate more income. It is calculated by dividing Net profit to total assets (Kabajeh, 2012), (Mustafa et al., 2012). When the ratio is higher, it is showing that the management is efficiently utilizing assets indicating how many dollars of earnings the bank derive from each dollar of assets they control.

ROA is useful device for comparing the organizations with in the same industry. The higher ratio indicates the institution is performing well. It is a useful tool for comparing profitability of one bank with other or the whole commercial banking system (Bentum, 2012).

### **2.1.7 Credit Risk Management Indicators:**

Based on frequency of references in various researchers as well as their properties, the following variables will be discussed as a measure of credit risk management variables:

#### **None Performing Loans (NPL)**

Loans form a higher portion of the total assets in banks. These assets generate huge interest income for banks which to a large extent determines the financial performance of banks. However, some of these loans usually fall into non-performing status and adversely affect the performance of banks.

Nonperforming loans have been a hindrance to economic stability and growth of economies (Abd karim et al., 2010). Basing the above facts, a number of researchers like Tefera (2011), Mekasha (2011), Poudel (2012), Murital & Taiwo (2013) and Joseph et al., (2012) have confirmed that NPLs have affected the performances of commercial banks negatively while they were performing their research on relationship between credit risk management and profitability of commercial banks.

#### **Loan Loss Provisioning**

Loan provisioning is the determination or estimation of the amount of non-performing loans which are likely to be uncollectible and providing for those on the basis of aging and risk class category of the loans concerned. A loan loss provision is the amount of expense that is reserved or set aside for defaulted loans or credit. Therefore, banks set aside a portion of the expected loan repayments from all loans in its portfolio to cover all, or a portion, of the loss. In the event of a loss, instead of taking a loss in its cash flows, the bank can use the amount set aside to cover the loss. Since the bank does not expect all loans to be late, there is usually enough in the loan loss reserve to cover the full loss for any one or small number of loans when needed. An increase in loan loss provisionn is also considered to be a significant determinant of potential credit risk (Funso, 2012).

#### **Capital**

Commercial banks are legally required to maintain adequate capital funds as they function to provide resources to absorb possible future losses on asset. A strong bank has a strong capital buffer to absorb unexpected losses (Brown & Moles, 2012).

According to Büyükşalvarcı and Abdioğlu (2011), the requirement of capital from the bank point of view and regulatory body is for different purpose:

Regulators require commercial banks to have more capital in order to protect the interests of depositors and protect banks failure. They monitor the capital positions of banks quite closely because banks by their nature are highly leveraged institutions, a decrease in the ratio of equity capital to total assets would also reduce the cushion that banks have to absorb credit or market related losses.

From Bank stockholders' viewpoint, the function of capital is to earn a satisfactory rate of return and hence is legally required to maintain adequate capital funds.

Accordingly, a minimum amount of capital is set by Central banks to protect depositors and promote the stability and efficiency of the financial system. In the event of a winding-up, depositors' funds rank in priority before capital, so depositors would only lose money if the bank makes a loss which exceeds the amount of capital.

The functions of capital are also stated differently by different scholars. According to Floro (2010), bank capital serves two main functions by representing the shareholder value of equity and the value of the buffer stock available to absorb unexpected losses arising from extreme events. But Ayayadin & Karakaya (2014) classified the functions of capital in banking industry into four:

- A. It is a buffer that absorb losses
- B. Increase the confidence of depositors
- C. It shows the fact that how much risk the bank owners get into
- D. It shows the fact that how much the lowest cost financing method has been used.

Capital is taken as the ratio of equity capital to total assets. It's interesting to note that higher the capital level breeds higher profitability level since by having more capital, a bank can easily adhere to regulatory capital standards so that excess capital can be provided as loans (Gul, 2011) & (Ponce, 2013).

### **2.1.8 Profitability of Commercial Banks**

As the topic of the research itself is impact of credit risk management on profitability of commercial banks, clear explanation for the need of profitability is important in order to understand the relationship between credit risk and profitability. Financial sector plays a pivotal

role in bringing sustainable economic growth & development (Javaid, 2011). In order to do so, banking system must be profitable as it is the most significant and consistent indicator for the smooth running of any business in today's competitive setting and has a significance impact on performance positively (Tariq, 2014). Profitability in commercial banks is determined by the ability of the banks to retain capital, absorb loan losses, support future growth of assets and provide return to investors (Bank of Tanzania, 2007). It is also an indicator of banks' capacity to carry risk and/or increase their capital (Li & Zou, 2014). The competitiveness as well as measurement of management's quality can also be indicated through the profitability of commercial banks and hence profitability is a pro-foundation for product innovation, diversification and efficiency of the commercial banks. The stability of commercial banks as whole in the economy depends on profitability level as it has tendency to absorb risks and shocks that commercial banks can face.

### **2.1.9 Determinants of Bank Profitability**

In banking, the determinants of profitability are well observed and explored as it is increasingly important to strengthen the foundations of domestic financial system as a way to buildup flexibility for capital flow volatility. The determinants on commercial bank profitability have been studied by different authors where they classify them in two major factors:

**Internal Factors:** Those factors are internal to the firm where they are related to managerial decisions and policy objectives to be achieved by the management. Internal factors are also called Micro or bank specific determinants. They are under the control of management and hence called managerial factors. Among the internal factors Capital Adequacy Ratio, Credit risk, Productivity growth & bank Performance are the main ones (Almumani, 2013) & (Frederic, 2014). Lartey et al.(2013) has also classified the internal determinants of profitability in two main classes: financial statement variables like expense management, loan composition & bank credit, composition of bank deposits, bank earning and operational efficiency, changes in capital and liquidity management and non financial statement variables like number of bank branches, bank size and location.

**External Factors:** are those factors that are out of the control of the management and hence environmental. They are affected by industry related macroeconomic variables like GDP, financial market structure, trade interdependence, Economic growth, inflation and market

interest rate and ownership structure (Li & Zou,2014), (Almumani,2013), (Frederic,2014), (Ani et al., 2012) & (Lartey et al.,2013).

Together with the above authors, Belete (2013) while he was examining the asset liability management and commercial banks profitability in Ethiopia, he states that the internal factors encompasses asset liability management culture of the bank and external determinants reflect the economic and legal environment that affect the operation and performances of the bank. With this he stated that asset liability management plays a dynamic role with regard to microeconomic determinants of commercial banks profitability.

## **2.2 Empirical Review**

Different researchers has made research on the relationship between credit risk management and profitability of commercial banks. Their empirical results, basing the variables similar with the current study, were reviewed as below:

### **2.2.1 Capital Adequacy Ratio and Profitability**

Many of the researchers who made their research on credit risk management and profitability of commercial banks have used CAR as one credit risk variable indicator. Among them, Gizaw, (2015) in Ethiopia, Charless & Kennet,(2013) in Nigeria, Afriye & Akotey (2012) in Ghana, Adeusi (2013) in Nigeria, Abiola & Olausi (2014) in Nigeria, W.U et al.(2012), Ponce(2012), Neceur,(2003), Francis(2013), Zhang & Epperson(2014), Onuonga,(2014) in Kenya, Almazari (2014) in Saudi Arabia, Apler & Anbar(2011) in Turkey and Tabari et al.(2013) in Iran were some who found positive impact on the profitability of their commercial banks during the period where for some of them the impact was significant while insignificant for other.

### **2.2.2 Loan Loss Provision Ratio and Profitability**

As the author of this research paper did, many researchers have selected it as credit risk management variable which impacts on profitability of commercial banks either positively or negatively. Among the researchers who have obtained a negative and significant impact of loan loss provision on profitability: Mekasha,(2011) in Ethiopia, Funso et al.(2012) in Nigeria, Accordingly, they concluded that bank management should allocate more fund to it and hence recommended establishing strategies that enhance profitability's of commercial banks rather than focusing only on minimizing credit risk exposures. Ayaydin & Karakaya(2014), explored that a bank making a high risk loan will allocate more funds to loan loss reserve compared to a bank

taking lower risk. Thus depositors require higher rate for depositing in a riskier bank and hence resulted in reduction of profit. But in contrary; Charless & Kennet(2013), Gizaw(2015), Afriye & Akotey(2012) and Kaaya & Pastory,(2013) in Tanzania were the other researchers who found a positive impact on profitability of commercial banks.

### **2.2.3 Liquid Asset Ratio and Profitability**

Almazari(2014) investigating a comparative study on the impact of internal factors on profitability in Saudi Arabia and Jordan banks found that the liquid asset to asset ratio was positively related to profit on Saudi banks while negatively related to profit on Jordan banks but the positive and negative effect was insignificant. But Alper & Anbar, (2011) while they were examining banks specific and macro-economic determinants of bank profitability in Turkey found that liquid assets had negative but insignificant impact on the profits of the Turkey banks during the study period using return on asset as well as return on equity as profit indicator variable and hence concluded that the liquid asset ratio had no important influence on the profitability of the banks during the study period. The result of Alper & Anbar, (2011) was also repeated by Elsiefi,(2013) while researching to investigate on determinants of conventional and Islamic banking profitability in Qatar using return on asset as one dependent variable.

### **2.2.4 Loan to Asset Ratio and Profitability**

Mustafa et al,(2012), found that loan asset ratios of commercial banks have a positive and significant impact on profits of commercial banks in Pakistan during the period 2001 to 2009 years where the study was done using a panel data from balance sheet and income statements of 15 Pakistan commercial banks of which the data were analyzed using multiple regression methods. A positive impact of the ratio on profit were also evidenced by Ayaydin & Karakaya(2014), Gul, et al.(2011), Tariq et al.(2014), Almumani(2013), Ani, et al.(2012), Ponce(2013), Naceur (2003) and Onuonga (2014) evidencing that as banks were increasing the ratio of loan, a better return on asset will be realized because higher loan ratio is associated with higher interest margin. Among the researchers listed above, the result obtained by Almumani,(2013) who made the research having an objective of determining management controllable factors that determine profitability of Jordanian commercial banks showed insignificant impact of loan to asset ratio on profitability the banks.

### **2.2.5 Deposit to Asset Ratio and Profitability:**

Among the researchers who took deposit to asset ratio as one variable for measuring their impact on profitability and found negative impact on profitability were: Muritala & Taiwo (2013), Tariq et al.(2014), Zhang & Epperson(2004) and Alper & Anbar(2011). Muritala & Taiwo, (2013) evaluate the impact of credit risk management on banks profitability using deposit to asset ratio and Non-performing loans as credit risk indicators while return on asset as profit variable in Nigeria. Accordingly, their result revealed that both variables (Deposit to asset and NPL) had a significant and inverse relationship with the profitability of the sampled banks during the study period and hence forwarded their recommendation that while credit policy is established in Nigerian banks, a caution has to be taken in the way that might not affect profitability of the banks negatively.

### **2.2.6 Research Gap**

This section summarizes the theoretical foundation of bank loan and the banking industry in commercial bank of Ethiopia.. Credit risk management is a greater role in commercial bank of Ethiopia to minimizing credit risk that occurred in commercial bank of Ethiopia. The modern banking sector delivery modern service to the people and spread to the country of the world.. The preceding researcher used a panel regression model and used both secondary and primary source of data to determine credit risk. To fill these gaps this study used different variables that cannot be touched by different preceding researchers, used time series fixed regression model and only secondary data used. The variables that can be address in this study is capital asset ratio, loan deposit asset ratio, capital return on asset, totasset ratioal loans &, and total loans&advance as an explanatory variables of credit risk in commercial bank of Ethiopia.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

The methodology part of the research explains the design of the research, instruments to be utilized in order to answer the research questions, the sources of data secondary data, sample specification and finally the model adopted explaining the dependent as well as independent variables.

#### **3.1 Research Design**

A research design is a master plan that specifies the method and procedure for collecting and analyzing of data. It provides a plan for the research (Zikmund, 1998). The purpose of the research paper was explanatory as the emphasis in explanatory research is on the study of a problem in order to explain the relationship between the variables. It also attempts to build and elaborate on theories and add to predictions and principles where possible. Accordingly, the cause and effect relationship between dependent (profitability) and independent variables (Credit risk) were studied.

#### **3.2 Sources and Instruments of Data Collection**

The study was conducted based on data obtained from secondary data.

#### **3.3 Secondary Source**

The secondary data has ten year audited financial reports of the sampled banks ranging from 2008- 2017 taken from commercial Banks of Ethiopia. Together with the financial report; credit policy and procedure manuals, Brochures, commercial Bank of Ethiopia Directives as well as reference materials that are performed by prior researchers in the topic area were also used.

##### **3.3.1 Data Analysis and Interpretation**

Simple random model regression was used in order to analyze the relationship between dependent variable and independent variables.

### 3.4 Model Specification

The author has borrowed Charles & Kenneth (2013) econometric model which were used as a model while they were researching 'impact of credit risk management and capital adequacy on the profitability of commercial banks in Nigeria' with little modification. The general equation of multivariate regression model is:  $Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} \dots + \beta_k X_{ki} + \epsilon_i$

Where:

$i$  goes from 1 to  $N$ ,  $N$  is the number of observation

$\beta_0$  is the intercept

$\beta_1$ - $\beta_k$  is the slope of the line  $X_i$ - is the independent variables

$Y_i$ - is the dependent variable

Accordingly, the model adopted for the current study was specified as below:

$$ROA = \beta_0 + \beta_1 LLP/LA + \beta_2 LQA/TA + \beta_3 EQ/TA + \beta_4 LA/TA$$

Where:

ROA- Return on Asset (dependent variable)

LLP-Loan Loss Provision

LA- Loan & Advances

#### 3.4.1 Definition of Dependent and Independent Variables

#### 3.4.2 Introduction

Profitability ratios are an reduced for the firm's overall efficiency, growth, success & control and hence usually used as a measure for earning capacity of company based on its level of sales, assets, capital employed, net worth and earnings per share (Kebajeh, 2012). Accordingly, Creditors and Shareholders are interested in profitability ratios since they indicate the company's capability to meet interest obligations & the progress and the rate of return on their investments respectively. So it has for such a reason that the author will used ratio for the dependable variable as well as independent variables to be described below.

### 3.4.3 Dependent Variable

ROA: Profitability of the Commercial Banks.

Return on asset (ROA) is used as a major metric for measuring profitability while the endogenous drivers of bank profitability were used as the independent variables. Almumani (2013) revealed that a profitable banking sector is better able to withstand negative shocks and contribute to the stability of the financial system and hence financial institutions must watch carefully the determinants of profitability as they are increasingly important in order to strengthen the foundations of domestic financial system as a way to build flexibility for cash flow volatility. Profitability in commercial banks is determined by the ability of the banks to retain capital, absorb loan losses, support future growth of assets and provide return to investors (Quin & Pastory, 2012).

It is a ratio calculated by dividing net income by total assets. ROA shows the profit earned per dollar of assets which reflects bank's management ability to utilize the bank's financial and real investment resources to generate profits. This ratio measure for the operating efficiency for the company based on the firm's generated profits from its total assets (Kabajeh et al., 2012).

### 3.4.4 Independent Variables

#### **Total Loans / Total Asset (LAR)**

Asset composition of loans and advances, which are explained by total loans to total asset, are the main source of income and measure the liquidity of bank assets tied up with loan. Other variables constant, the more deposits are transformed into loans, the higher the interest margin and profits. On the other hand, if increasing loans leads to higher funding requirements, a negative impact of the loan ratio on the banks profitability may accrue (Tesfaye, 2012). Loans provide major means of earnings for commercial banks and it is often believed that the more banks offer loans the more it does generate revenue and more profit. These loans are expected to have a positive relationship with bank performance. But empirical evidence on the relationship between loans and profitability is mixed up. Researchers use loans and advance to total asset ratio in order to assess bank activity on bank risk because bank loans are relatively illiquid and subject to default risk showing a positive relationship between total loan and the risk measures.

**Liquid Assets to Total Assets (LATAR):**

Liquidity ratio is defined as the extent to which the banks fund are available to meet the withdrawal demand of depositors. Failing to fulfill liquidity requirement results in liquidity risk described as the risk of funding which is related to an expected event (Santomero, 1997) as cited by Li & Zou(2014). If the commercial banks are not liquid enough, they will not respond the demands of credit from customers. Liquidity risk reduces the ability of the bank to meet its financial obligations as they fall due (Ojong, 2014). This makes to reduce banks operation and then profit of the bank.

**Loan Loss Provision to Total Loan (LLPR)**

It is used as one part of credit risk because it is an indicator of asset quality in commercial banks indicating how much of the total portfolio has been provided for but not charged off (Frederick, 2014) & (Nawaz,2012). Indicator shows that the higher the ratio, the poorer the quality and therefore the higher the risk of the loan portfolio will be. The ratio of loan loss provisions to total loans shows the level of credit risk that the banks are exposing too. The relationship between loan loss provision and profitability is expected to be negative based on the concept that more bad loans reduce profitability. Loan loss reserve is defined as a valuation reserve against a bank's total loans on the balance sheet, representing the amount thought to be adequate to cover estimated losses in the loan portfolio. We consider loan loss reserves to gross loans ratio as a proxy of bank risk as this ratio may indicate the banks' financial health. A negative impact of loan loss reserve in capital could mean that banks in financial distress have more difficulties in increasing their capital ratio. In contrast, a positive effect could signal that banks voluntarily increase their capital to a greater extent in order to overcome their bad financial situation.

**Total Capital to Total Assets Ratio (CAR):**

Commercial banks are legally required to maintain adequate capital funds as banks capital or net worth serves as a buffer against losses and failure (Noceur & Kandl, 2008). It is one of the main indicators for determination of the capital, which shows the bank's capacity to cover losses (Erina & Lace, 2013). The primary function of bank capital is to provide resources to absorb possible future losses and handle risk exposure of the shareholders on assets. The capital ratio, which is measured by total equity over total asset, reveals capital adequacy and should capture the general safety and soundness of the financial institution. Capital Adequacy Ratio (CAR) is a measure of the amount of bank's capital expressed as a percentage of its risk weighted credit

exposure. It is taken as one independent variable as regulatory body considers as one core component of financial strength and hence other researchers has also used as one component in the evaluation of impact of credit risk management on profitability of commercial banks (Afriyie & Aketey, 2012).

## CHAPTER FOUR

### DATA ANALYSIS AND PRESENTATION

#### INTRODUCTION

Multiple Linear Regression analysis technique was used to analyze the relationship between Credit risk management and profitability of the commercial banks and the power of influencing each independent variable on ROA. Accordingly, before directly going to the analysis part, the following tests basic assumptions of multiple Linear regression analysis were multi-collinearity of independent variables, test of normality, Test of homoscedasticity and heteroscedastic test.

#### 4.1. Descriptive Statistics of the data

The descriptive statistics part assess the practice of credit risk management and profitability in commercial banks of Ethiopia . Bank specific variables were drawn from financial statement of banks that are taken from the NBE.

Table 4.1 provides a summary of the descriptive statistics of the dependent and independent variables Ethiopian commercial Banks from the year 2008 to 2017 with a total of 10 observations. The table shows the mean, minimum, maximum, standard deviation and number of observations for the dependent variable Return on asset (ROA), bank specific factors such Capital asset ratio (CAR), Deposit asset ratio (DAR), Total loan and advances (TLA), and LATAR.

Table 4. 1. below present the descriptive statics of dependent and independent variables.

Variables	ROA	CAR	DAR	LATAR	TLA
Mean	2.739	0.24347	0.7037	23.75	64949.4
Median	3.08	0.08915	0.7504	24.225	62318
Maximum	3.82	0.9004	0.9049	35	142004
Minimum	0	0	0	0	0
Std. Dev.	1.126355	0.324912	0.253603	10.04794	45870.05
Observations	10	10	10	10	10

**Source:** Computation from E-view out put

Table 4.1. Is also indicates the descriptive statistics for all variables. Accordingly, the minimum, maximum, mean and Standard deviations of ROA and the three independent as well as significant impact on profitability were described below:

The maximum and minimum value of ROA is 3.82 & 0 respectively with a mean of 2.739 unit showing that the most profitable bank has registered 3.82 unit profit per 1 unit of asset whereas the least profitable bank registered 0 unit profit per 1 unit of asset.

TLA has the highest mean value among the variables used as dependent and independent with a maximum and minimum value 142004 & 0 respectively while the standard deviation of the variable is 45870.05.

CAR of the sampled banks was 0.24347 unit during the study period where as their standard deviation is 0.324912 showing that there is a greater deviation of CAR between the sampled banks as the deviation between the mean is 0.324912.

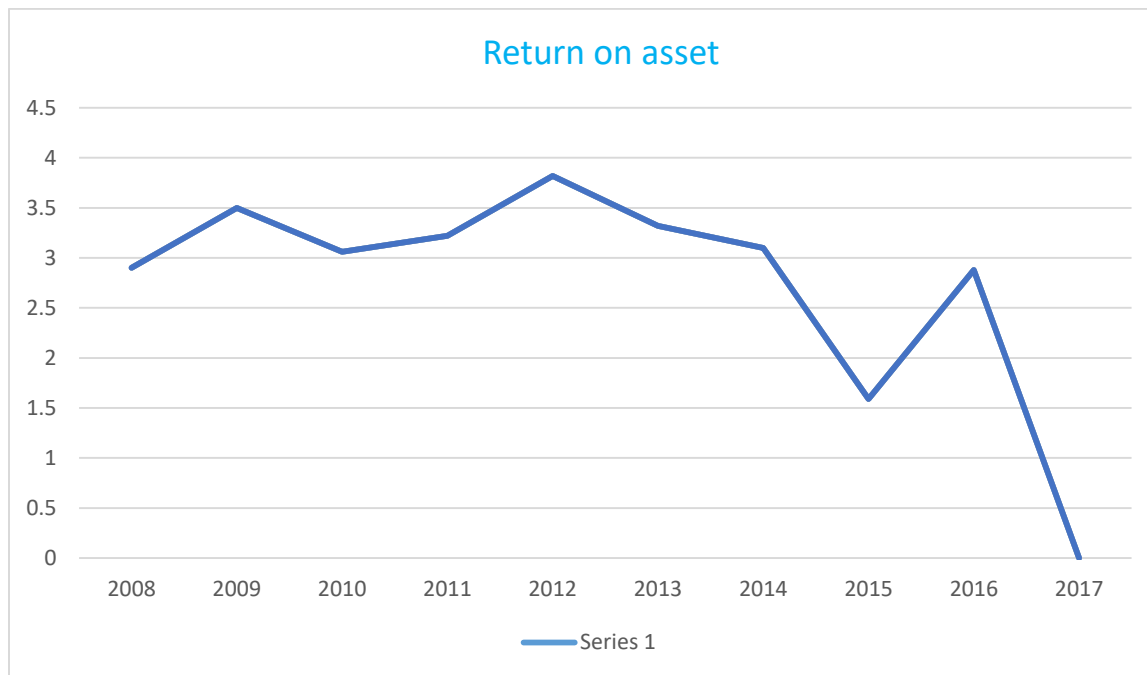
DAR of the sampled banks showed that; the banks had a minimum & maximum value of 0 and 0.9049 respectively having a mean of 0.7037 and standard deviation of 0. 253603.

The LATAR of the sampled banks had a mean of 23.75 while their maximum and minimum values are 35 & 0 respectively. This reveals that on average, the sampled banks have 36.2 unit of liquid asset per the available total.

## **4.2 Trend Analysis of Return on Asset of CBE from (2008-2017)**

This analysis established to a pattern for return on asset (ROA) of commercial banks operating in Ethiopia during the period under consideration, which is from 2008-2017. Accordingly, the following figure 4.2; provides a respective presentation for Credit risk figure from 2008-2017. In the following figure 4.2; x-axis represents the years where as y-axis represents the level of return on asset in commercial banks in Ethiopia.

Figure4. 1. average return on asset profitability in commercial bank of Ethiopia



**Source;** Computed from internal report of commercial bank of Ethiopia (2008-2017)

As can be observed from figure 2, most of the data are situated around the simple linear regression and hence the residual error between the observed and expected cases of the regression line is similarly showing that it is normally distributed.

### **Independence of Residuals**

Simple linear model regressions assume that the residual are independent. Residuals are the prediction errors or differences between the actual score for a case and the score estimated by the simple linear model regression equation. No serial correlation implies that the size of the residual for one case has no impact on the size of the residual for the next case. The Durbin-Watson statistic was used to test for the presence of serial correlation among the residuals.

### **4.3 Correlation matrix**

Correlation is a way to indicate the degree to which two or more variables are associated with or related to each other. The sample size is the key element to determine whether or not the correlation coefficient is different from statistically significant. A correlation coefficient of on the other hand indicates that there is no linear relationship between two variables (Gujarati, 2004). Correlation analysis is reported in manner is called a correlation matrix.

Table4. 2.correlation matrix dependant and independent variable

Variables	ROA	CAR	DAR	LATAR	TLA
ROA	1	0.249203	0.735379	0.688937	0.501289
CAR	0.249203	1	0.189198	0.443102	-0.48913
DAR	0.735379	0.189198	1	0.769936	0.517472
LATAR	0.688937	0.443102	0.769936	1	0.032645
TLA	0.501289	-0.48913	0.517472	0.032645	1

**Source;** E-view regression out put

Accordingly, the highest correlation result obtained was between CAR & LATAR having an output result of 0.443102 showing that there is no multicollinearity as it was far below the cut of point. Thus the degree of correlation between each pair of explanatory variable was very low as compared with the cut of point. With this result, the author has conclude there is no multicollinearity between the independent variables that will distort the strengths of the model and hence the independent variables have a great predicting power.

#### 4.4 Classical linear Regression model

For valid hypothesis testing and to make data available for reliable results, the test of assumption of regression model is required. These regression model test includes different types of tests that can performed in regression analysis. According to this, the study used the most critical regression data model tests consisting of Multicollinearity, heteroskedasticity, Normality and autocorrelation.

##### 4.4.1. Multicollinearity Test

Multicollinearity happens when one or more explanatory variables were highly linearly related to each other. Perfect multicollinearity means one independent variable is a perfect linear function of the any other independent variable. Imperfect multicollinearity is a linear fictional relationship between two or more independent variables that is so strong that it can significantly affect the estimation of the coefficients of the variables. Multicollinearity will cause the variances and standard errors of the estimates to increase and the t-scores to decrease. If the r is high in absolute value, then the variables are quite correlated and multicollinearity is a potential problem. Multicollinearity is all about the linear relationship among the independent variables. If

the variables are linearly related, a unit change in one of the variable coincides with a unit change in the other variable and hence we cannot determine the separate effects of both variables on the dependent variable.

In order to detect the multicollinearity of the independent variables, the author has used by: One way to detect multicollinearity is by examining Tolerance and the Variance Inflation Factor (VIF)-the two multicollinearity factors that can help us to identify multicollinearity.

Table 4.3 Variance Inflation Factor ( VIF)

Variable	VIF	1/VIF
Latar	3.36	0.297799
Dar	3.27	0.306036
Roa	2.37	0.421661
Car	1.34	0.745963
Mean VIF 2.58		

### **The Variance Inflation Factor (VIF)**

The Variance Inflation Factor (VIF), which is defined as measures the impact of multicollinearity among the variables in a simple linear regression model. The Variance Inflation Factor (VIF) is the reciprocal of tolerance value of the Tolerance). It shows us how much the variance of the coefficient estimate is being inflated by multicollinearity. It is always greater than or equal to 1. The cutoff point to detect the presence of multicollinearity differs for researchers to researchers. As per Marquardt, (1970) cited on (Chang kua, 2010), the model will be seriously affected by multicollinearity when values of VIF exceed 10. But in weaker models, values above 2.58 may be a cause for concern. According to Alkhatib (2012), multicollinearity does not exist between independent variables when VIF values are less than 5.

#### **4.4.2. Homoscedasticity & Linearity of variables**

##### **Linearity**

A simple linear regression line assumes that the relationship between dependent and independent variables should be linear. The assumption is usually evaluated by visual inspection of the scatter plot. Violation of the assumption may result in understatement of the strengths of relationships between the variables. In order to check linearity of the independent and dependent variables, all of the variables were entered to Eview software and a visual inspection of the variables showed that, there was a linear relationship of CAR, DAR, LAR, with ROA while LATAR difficult to judge even though it seems somehow linear.

##### **Homoscedasticity:**

It is similar with homogeneity of variance. Homoscedasticity means that the variance of dependent variable for each value of the independent variables is constant. Violation of homogeneity of the variance will reduce the strengths of relationship between the variables. As a result, the range of variance for the dependent variable was uniform for each independent variable and hence the author concludes that there was no heteroscedasticity of variables that can result in reducing the strengths of the relationship.

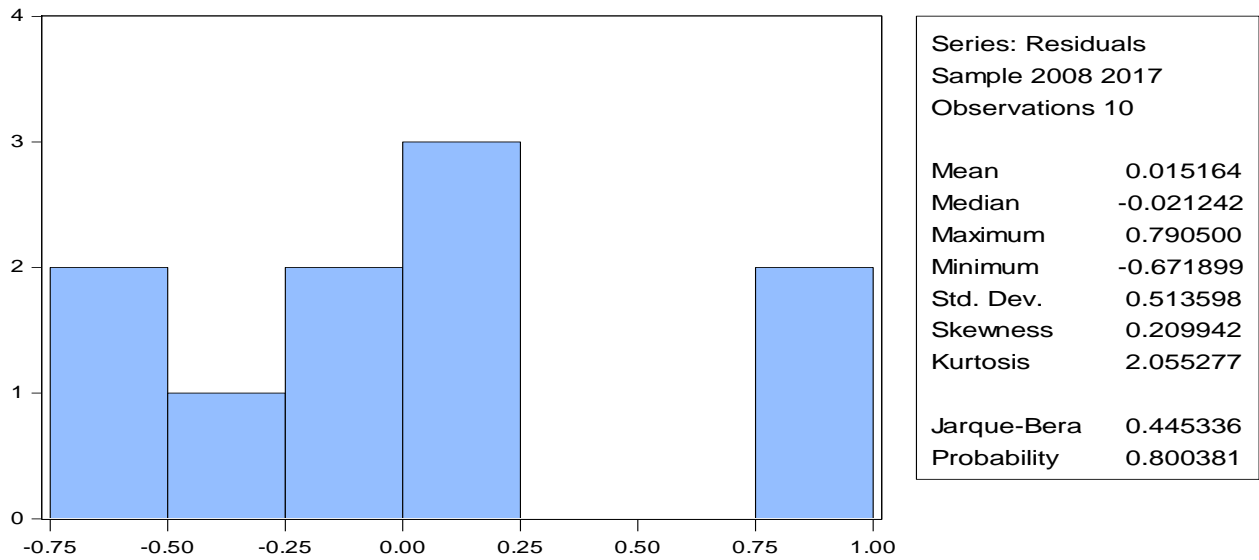
#### **4.4.3. Normality of Distributions**

As per Osborne & Waters (2002), multiple regression assumes that variables have normal distributions. Non-normally distributed variables (highly skewed or kurtotic variables, or variables with substantial outliers) can distort relationships and significance tests. There were several pieces of information that are useful in testing normality assumption: visual inspection of data plots, skewness, kurtosis, are some of them in which the author has used to test the normality of the research data.

Skewness is statistics used to measure degree of symmetry in a distribution while Kurtosis measures the shape of the distribution i.e. it tells us how scores are concentrated in the center of the distribution.

Figure4. 2.regression standardized residual

**Test of Normality**



**Sources;**EveiwRegressionoutput

As can be seen from the above graph; the value of standard deviation and mean which approaches to 0.513598 and 0.015164 respectively implies that the residuals are normally distributed.

**4.4.4. Autocorrelation test**

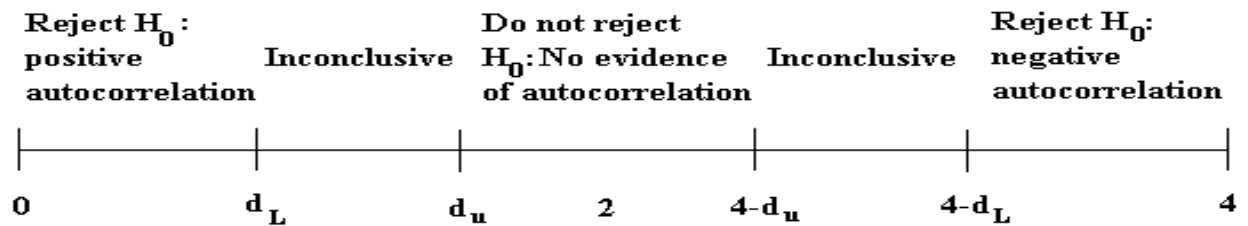
Another basic assumption of regression model says that the covariance between error terms should be zero. This means that error term should be random and it should not exhibit any kind of pattern. If there exists covariance between the residuals and it is non-zero, this is called autocorrelation Brooks, (2008). The Constance relation or line that drawn between the actual and the feted value near to zero. Test area joint test for autocorrelation that allow examination of the relationship.

between ut and several of its lagged values at the same time. Durbin-Watson (DW) is a test for first order autocorrelation-i.e. it tests only for a relationship between an error term.

Table 4. 3 Auto correlation test Durban Watson (DW) test

Dependent Variable	R-squared	Adj R-Squared	DW
CR	0.791879	0.687818	2.063690

Source: computation from E-views



The study used the  $d_L$  and  $d_U$  values for 10 observations. As per the DW test with five explanatory variables at 5% level of significance level. The DW values was 2.063690. The DW value of lies in the inconclusive region where the null hypothesis of no autocorrelation can neither be rejected nor not rejected.

#### 4.5.5. Heteroskedasticity assumption Tests

The condition of classic linear regression model implies that there should be homoskedasticity between variables. This means that the variance should be constant and same. Variance of residuals should be constant otherwise, the condition for existence of regression, homoskedasticity, would be violated and the data would be heteroskedastic Brooks, (2008). To check for this, Breusch-Pagan-Godfrey test were applied. The Breuschpagan tests of the null hypothesis that the error variances are all equal versus the alternative that the error variance are a multiplicative function of one or more variables.

Hence, following the general null hypothesis of Breusch-pagan tests, the researcher develops the following hypothesis to check the presence of heteroskedasticity:

$H_0$ : homoscedastic error term

$H_1$ : heteroskedasticity error term hottest

Table4.4 Breusch-Pagan-Godfrey Test of model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
F-st	1.292509		Prob. F(4,5)	0.3849
Obs*R-squared	5.083597		Prob. Chi-Square(4)	0.2788
Scaled explained SS	0.991168		Prob. Chi-Square(4)	0.9111
C	0.033449	0.243811	0.137193	0.8962
CAR	0.551828	0.358154	1.540756	0.1840
DAR	0.732130	0.838763	0.872868	0.4227
LATAR	-0.016334	0.017173	-0.951165	0.3852
TLA	-8.84E-07	3.45E-06	-0.256192	0.8080
R-squared	0.508360	Mean dependent var		0.237635
Adjusted R-squared	0.115047	S.D. dependent var		0.260700
S.E. of regression	0.245245	Akaike info criterion		0.333736
Sum squared resid	0.300726	Schwarz criterion		0.485029
Log likelihood	3.331319	Hannan-Quinn criter.		0.167769

**Source:** Eview regression out put

Both F-statistic and chi-square tests statistic were used. As can be presented in the above Heteroskedasticity test both the F test statistics give the same conclusion that there is significant evidence for the presence of Heteroskedasticity. Since the p-values in all of the cases were above 0.05, the null hypothesis of homoskedasticity is failed to reject at 5 percent of in significant level. This implying that there is significant evidence for the presence of heteroskedasticity in these research models. The third version of the test statistic, “scaled explained which as the name

suggests is based on a normalized version of the explained sum of squares from the auxiliary regression, also give the same conclusion.

## 4. 6. Regression Results

Table4. 5 Dependant variables ROA

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CAR	1.450730	0.914690	1.586035	0.1638
DAR	-1.805797	2.108932	-0.856261	0.4247
LATAR	0.092164	0.043553	2.116151	0.0787
TLA	2.24E-05	8.77E-06	2.548859	0.0436
R-squared	0.791879	Mean dependent var	2.739000	
Adjusted R-squared	0.687818	S.D. dependent var	1.126355	
S.E. of regression	0.629331	Akaike info criterion	2.200857	
Sum squared resid	2.376347	Schwarz criterion	2.321891	
Log likelihood	-7.004283	Hannan-Quinn criter.	2.068082	
Durbin-Watson stat	2.063690			

**Sources;** E-view regression out put

Capital Asset Ratio and Deposit Asset Ratio is insignificant relation ship between Return on Asset on the 0.1638 and 0.4247 of the probability respectively, liquid Asset to Total Asset Ratio 0.0787 insignificant relation ship between Return on Asset and Total Loan and Adeavance are significant relation ship between Return on Asset on 0.0436 of the probability.

## 4.7. Interpretations on regression results

This section discusses in detail the analysis of the results for each explanatory variable and their importance in impact of Credit Risk management in profitability of Ethiopian Commercial Bank and the statistical findings.

Table4.3 shows The R-squared and Adjusted R-squared values of 0.79187 and 0.687818 respectively is an indication that the model is a good fit. The adjusted R-squared is 0.687818, which means that 0.687818 of variations in credit risk ratio of Ethiopian commercial Banks were explained by independent variables in the model.

### 4.7.1 Discussions of the Regression Result

This section presents explanation of each coefficient of independent variables with their implication comparing them with prior research results.

This section presents explanation of each coefficient of independent variables with their implication comparing them with prior research results. When we look the regression analysis and Analysis of Variance in table 2 and table 3, respectively, it reveals that the explanatory power of the overall regression model is about 79.187% as evidenced by the R-square, where at the same time, the F-stat is 1.292509 and is less than 5%, which is significant. This implies the acceptance of the model that “there exist an impact of credit risk management on profitability of commercial banks becomes realized. Thus, it is possible to conclude that 79.187% of the variation in the ROA can be explained by the combined effect of variations of explanatory variables. As per Kayaa & Pastors (2013), with reasonable judgments of R-square & adjusted R-square of above 50% have greater ability to influence the dependent variable, the predicting power of the model is said to be strong.

**CAR:** Observation of coefficient of capital adequacy ratio is 1.450730 and it indicates that there is positive and statistically insignificant effect at 5% level of significant between dependent variable (return on assets) and independent variable (capital asset ratio). Holding other independent variables constant, an increase in one unit of CAR, ROA increase by showing that there is a direct relationship between CAR and profitability of private commercial banks during the period. This is consistent with (Almazari, 2014), (Ogbuabor,2013), (Ayadi & Boujelbene,2012), (Charless & Kenneth,2013), (Afriye & Akotey,2012), (Onuonga,2014) & (Obamuyi, 2013) but the research result is contradictory with the research results of (Poudel, 2012), (Almumani,2013), (Tefera,2011), (Gizaw, 2015) where their empirical result shows that CAR is inversely related to performance of commercial banks. As per Obamuyi (2013) the research result indicates that banks with larger capital are able to diversify their business operations by strengthening their ability to assume risk and attract funds at low cost, which will enhance their liquidity position which intern effect in an improvement of their lending, with positive effect on profitability.

**LATAR:** Liquid asset to total assets of the private commercial banks, obtained from the empirical research data shows that there is a positive and insignificant relationship with ROA. The coefficient of variable reveals that 1 unit increase in LATAR increases ROA by 0.092164 unit. Adebayo (2011) defined bank liquidity as the ability of the bank to ensure the availability of funds to meet financial commitments or maturing obligations at a reasonable price at all times. To this effect the survival of commercial banks depends greatly on how liquid they are since illiquidity being a sign of imminent distress which can easily erode the confidence of the public in the banking sector.

**DAR:** The deposit to asset ratio was used as one variable to increase the contribution of deposit in credit risk management. Deposit to asset ratio is a variable measuring the amount of deposit relative to the size of the bank (Asset). The research result shows that DAR is inversely related to profitability of commercial banks. A 1 unit increase in DAR decreases ROA -1.805797. Implying that there is an inverse relationship of DAR with profitability during the period. The result is supported by Alper & Anbar (2011) who made an empirical study on the variable shows that deposit to asset ratio is negatively and insignificantly related to ROA. Bentum, (2012) justified the reason for inverse relationship of deposit with profitability of commercial banks by saying the ratio would be negatively related to the profits of the bank when the deposit collected is not converted to loan as fixed, term & time deposits attract interest from banks to depositors.

**TLA:** Observation of the empirical result indicates that there is an direct and significant relationship between total loans and advance and profitability of the commercial banks. Holding the other independent variables constant unit increase in total loans and advance decreases ROA by 2.24 E-05 units. It is the strongest & significant of all independent variables.

## CHAPTER FIVE

### SUMMARY, CONCLUSION AND RECOMMENDATION

#### 5.1 summary

The main objective of this study was to examine the impact of credit risk management profitability of commercial banks in Ethiopia. The study covered nine year data of commercial bank in Ethiopia from the period 2008-2017. To achieve the objective, the study used fixed effect time series regression model for five variables of the study of firm specific variables. The data of this study; audited financial statements were collected from (i.e for firm specific variables), were collected from NBE. Variables included in this study are CAR, DAR, LATAR, TLA and ROA as an explanatory variables and ROA as dependent variable. The analysis was conducted using time series data estimation technique effect model using E-Views statistical software. The finding of the trend analysis of Credit risk shows a downward sloping of ROA of commercial banks in Ethiopia over the period (2008-2017).

Data was analyzed by using both descriptive statistic, multiple regression model and, fixed effect time series data model. The study test different assumptions such as hetroskedastic, autocorrelation, Multi-collinearity and normally distribution. Finally the fixed effect regression results were presented and analyzed, the finding of this study show that bank specific factor like; capital asset ratio, deposit asset ratio, total loans and advance, loans asset to total asset, and Return on asset , were asset statistically significant effect on the level of Credit risk.

In addition the study has showed negative coefficient for DAR and Positive significant of the variable are, whereas; capital asset ratio, liquid asset to total asset ratio and total loans and dvance have positive coefficient. Also the coefficient of determination R-squared is 0.791879 and adjusted R<sup>2</sup> is 0.687818 which indicates that the explanatory variables were able to account 68.78 of the total variations of the dependent variable credit risk.

#### 5.2 Conclusions

The study was generally aimed at to know the impact of credit risk management on profitability of commercial banks in Ethiopia specifically in order to know the relationship between each credit risk indicator variables with profitability. Simple random sampling regration model of ten observations were selected using purposive sampling techniques covering from 2008 to 2017 and then analyzed using multiple linear regressions method. The secondary data were collected from

the annual reports of each banks and from NBE five explanatory variables (CAR, LATAR, DAR, & LAR ) were used as credit risk indicator regressing against one dependent variable (ROA) as profitable variable.

Before the regression analysis were performed in order to check Linearity, Multicollinearity, Homoscedasticity, Independent of the residual & Normality of the variables. Accordingly, the test result shows that there was no correlation among the independent variables (showing multicollinearity), the variables were normally distributed, there was heteroscedasticity, there was no serial correlation among the residuals as the value of Durbin Watson Statistics is within the acceptable range even though it approaches to the minimum value. as the F value (1.292509) is showing again that there was a significant relationship between the credit risk variables and the profitable variable. The model is said to be strong as the the coefficient of determinant (Adjusted) and adjusted R-squared were 0.791879& 0.687818 respectively implying that of the variations in the ROA is explained by the credit risk management variables.

CAR is the other credit risk management variable used for the study. The result reveals that CAR has a positive and in significant impact on the profitability of the banks. A 1 unit increase in CAR increases ROA by 0.551828 units. Indicating that well capitalized banks can be used as resources to absorb possible future losses and handle risk exposure of the shareholders on assets as well as it is used to protect depositors and other lenders.

The regression result on LATAR showed a positive impact on the profitability of commercial banks. In LATAR decreased by ROA -0.016334 unit. It is a liquidity ratio used as credit risk measurement variable. The result indicates that the more liquid the banks are, their ability to serve their current obligation will decreased.

The last variable used as credit risk indicator is DAR which shows an direct relationship with profitability. That is 1 unit increase in DAR results in a decrement of ROA -1.805797 units. One possible reason for inverse relationship with profit could be due to as banks pay interest for the collected deposit and hence reduce their income as far as the deposit is not converted to loan.

### **5.3 Recommendations**

Based on the findings of the research and conclusions, the author has recommended the following points:

Capital adequacy, loan loss provision as well as liquidity were among the variables which are affecting the profits of the private commercial banks significantly. So bank personnel's especially

managers should focus their main activities towards those variables in the way that should not affect the profits of the bank negatively. Moreover, the National Bank of Ethiopia, while issuing directives related to credit facility, should not affect the profits of the banks -the empirical result of liquidity shows positive and significant on profitability. But the loan disbursement of the private commercial banks are limited which partly is due to directives. Ethiopian Commercial Bank as they need to improve their cost management. They might improve their level of non-interest income.

Private banks should hold back impact of loan quality (credit risk) by prudent lending through proper analysis together with regular monitoring, by updating credit policy, following up the financial status of the borrowers and gathering sufficient information about the borrowers since improper credit risk management increases loan loss provisions and hence reduce the banks' profitability.

As the author of this research paper is based on the financial statement variables of internal factors, the author suggested further research to be carried out by the external factors that would affect profitability basing this research paper as a stepping stone. Even researchers can expand the number of observations (Samples) which will enable to make a conclusive on the topic of the research as well as it may enable to find the un explained portion of the multiple linear regression mode.

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### **Future of Research Direction**

The Impact of credit risk management on profitability in commercial banks of Ethiopia. In this research, only secondary data gained from audited financial statements of commercial banks of Ethiopia were used by using time series Fixed regression model to test classical linear regression assumptions based on ten-year data (2008-2017). The explanatory variables that were used in this research were: Liquid Asset to Total Asset, Deposit Asset Ratio, Capital Asset Ratio, and Total loan and Advance. The dependent variable was Return on Asset. I recommend that future researchers use both primary and secondary data to analyze the impact of credit risk, use panel regression model tests by considering different variables that cannot be touched by this research.