THE EFFECT OF CREDIT RISK ON THE FINANCIAL PERFORMANCE OF COMMERCIAL BANKS: EVIDENCE FROM SELECTED PRIVATE COMMERCIAL BANKS IN ETHIOPIA

A THESIS SUBMITTED TO ADDIS ABABA UNIVERSITY COLLEGE OF BUSINESS AND ECONOMICS DEPARTMENT OF ACCOUNTING AND FINANCE IN PARTIAL FULFILLMENTS OF REQUIREMENTS FOR DEGREE OF MASTERS IN ACCOUNTING AND FINANCE

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DECLARATION

I hereby declare that the thesis entitled “the effect of credit risk on financial performance of private commercial bank in Ethiopia” for the award of degree of masters in Accounting and Finance at Addis Ababa University, College of Business and Economics, has been completed is original not presented by anyone before now. All the supporting materials used in the completion of this paper are acknowledged appropriately.

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CERTIFICATION

This is to certify that the thesis prepared by Tesfaye Ayalew, entitled: “the effect of credit risk on financial performance of private commercial bank in Ethiopia” and submitted in partial fulfillment of the requirements for the Degree of Master of Science in Accounting and Finance act in accordance with the regulations of the University and meets the accepted standards with respect to originality and quality.

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Table of contents

Declaration ii
Acknowledgment iii
List of acronyms vi
Tables vii
Figures ……viii
Abstract ix
CHAPTER ONE: INTRODUCTION 1
1.1 Background to the study 1
1.2 Statement of the problem 3
1.3 Objectives of the study 5
1.3.1 General objective…..... 5
1.3.2 Specific objectives 5
1.4 Research questions 6
1.6 Significance of the study 6
1.7 Scope of the study 7
1.8 Limitation of the study……..7
CHAPTER TWO: LITERATURE REVIEW ……8
2.1 Theoretical literature review 8
2.1.1 Risk 8
2.1.2 Credit risk 8
2.1.3 Credit risk management 9
2.1.4 Risk Mitigation……..……12
2.1.5 Assessment credit Risk management……..……12
2.1.6 Loan Appraisal 13
2.1.7 Credit Administration policy ……13
2.1.8 Risk Tolerance 14
2.1.9 Bank performance…… ……..…….. 14
2.1.11 Bank performance measures ……..……..…… 15
2.1.12 Credit risk measures……..……..……..……15

2.2 Empirical literature review……..……17
2.3 Summary of literature gap ……...……...……...…….19
2.4 Conceptual framework ……..……..……...……20
CHAPTER THREE: RESEARCH METHODOLOGY 21
3.1 Research Approach 21
3.2 Research Design.....21
3.3 Nature and Sources of data 22
3.4 Population and Sample Size.....22
3.5 Sampling Method……22
3.6 Method of Data analysis 23
3.7 Study Variables.....23
3.7.1 Independent Variables. 23
3.7.2 Dependent Variables 24
3.7.3 Control Variable……...……..24
3.8 Model Specification.....……..25
4. CHAPTER FOUR: DATA ANALYSIS AND INTERPRETATION ……..26
4.1 Descriptive Statistics ……..…….26
4.2. Correlation Analysis of the Study Variables ……..……. 29
4.3 Classical Linear Regression Model (CLRM) Assumption Test ……...…. 30
4.3.1 Check for Normality …….…….30
4.3.2 Hetroskedastesity test ……...…….32
4.3.3 Multicollinearity Test ……..…….. 34
4.3.4 Omitted Variables Test ……..35
4.3.5 Regression Analysis ……. 36
4.3.6 Discussion of Regression Results ……...……. 37
CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS ……40
5.1. Summary of the findings …….……..40
5.2 Conclusion ……..40
5.2 Recommendations ……..……42
References.……..……..….. 43

LIST OF ACRONYMS

AB	Awash Bank
BS	Bank Size
BIB	Bunna International Bank
BoA	Bank of Abyssinia
CAR	Capital Adequacy Ratio
CLRM	Classical Linear Regression Model
DB	Dashen Bank
LIB	Lion International Bank
LPTAR	Loan provision to asset ratio
NIB	Nib International Bank
NPLR	Nonperforming loan ratio
OLS	Ordinary least square
ROE	Return on Equity
UB	United Bank

List of Tables

Table 4.1 Descriptive Statistic …….…… 29

Table 4.2 Correlation analysis of study variables……..32

Table 4.3 Correlation matrix of the dependent variables of the study …….…….39

List of Figures

Figure 2.1 Schematic diagram of theoretical frame work ……..……..……. 21
Figure 4.1 Test for normality of the dataset ……..34
Figure 4.2 Regression results of the sample variables ……..……35
Figure 4.3 Breusch –Pagan Godfrey (BPG) test for hetroskedasticity ……..…….. 36
Figure 4.5 Regression result after correction in the hetroskedastesity …….……..…….…38
Figure 4.6 Test of multicollinearity between the independent variables …….……..…40
Figure 4.7 Omitted variable test. …….……..41
Figure 4.8 Regression output ……...…….42

Abstract

Banks are the biggest and foremost financial institutions that constitute the lion's share of economic growth and development in both rich and poor countries around the world. To realize this, they need to maintain stable, continual and reliable financial performance through mitigating any form of risk in general and credit risk in particular since credit risk has profound effect bank profitability. As a result, the basic purpose of this investigation was to analyze the relationship between credit risk and bank profitability and recommend possible solutions. Accordingly, a ten year data (2011-2020) from seven sample private commercial bank's secondary data were taken and analyzed. The result of econometrics regressions revealed that at 95% confidence interval credit risk measures (included in this study capital adequacy ratio, nonperforming loan ratio and loan loss provisions) have significant effect on performance measure return on equity keeping bank size constant. Eventually, the findings of the research concluded that significant correlation is existed between credit risk and bank profitability. Hence, the study has recommended that banks regarding to these predictive factors, need to develop efficient credit administration strategy to maintain trustful financial performance.

Key words: *banks, profitability, credit risk, loan*

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

In modern times, providing a loan to finance needs of the counterparties and deriving interest revenue is a customarily practice of commercial banks in Ethiopia. However, the inevitable risks associated with lending money where partial or complete non-repayment of the principal, as well as the interest on time is one of the main reasons that commercial banks are experiencing losses. Therefore, commercial banks need to give a considerable space in developing strong credit risk administration strategy enabling them to mitigate credit risk and achieve their ultimate goal of attaining maximum profitability at minimum cost (Abera, 2018).

Most often, commercial banks are profoundly seen assessing credit risk through examining bank profitability and their financial robustness significantly depends on accurate credit risk measurement and the quality of credit risk management system they employed. Commercial banks thus should be keen to identify, evaluate, measure and monitor credit risk that has adverse potential of hindering commercial bank's financial performance and hold adequate capital adequacy to offset credit risks (Bhattarai, 2016).Similarily, for any Commercial banks around world, having stringent Credit administration policy can serve as risk minimization tool that come as a result of non-performance loan (Olugboyega et al., 2018). Therefore, the banking industry credit creation process policy requires an attempt to encompass appropriate risk mitigating follow up mechanisms.

The credit risk tells investors how risky it is to invest in any particular asset. The higher risk, the higher the chances of losing money on the investment, and vice-versa. Unpaid loan were, are and will always be the consequence of conducting core business by which bank profitability extremely susceptible to credit risk. Therefore, to deal with such risk modern banks have to realize the need to hold certain amount of money as a reserve and maintain provision account, at the moment the loan is made, to mitigate risk. This is the exclusive choice for commercial banks to longer survive as there is no capital market Ethiopian to diffuse risk amongst the various invertors in the event of default (Mulugeta, 2018).

Commercial banks undertake numerous activities for their sustainability and the king of all these activities is the credit without which the banking sector can no longer survive. The fact is that it constitutes the lion's share of bank revenue in the form of credit interest. However, this is always with the subsequent inherent credit risk (for any default probability) that forced to downturn financial performance of commercial banks in particular and the entire economy as a whole(Saeed & Zahid ,2016; Kodithuwakku ,2015).

Because of the nature of their business, commercial banks are by default susceptible to the default risk by the counter party to settle its obligations as agreed. Lending is a business for commercial banks and it is the main source of risk-credit risk as well. Thus prudent credit risk assessment and instituting proper credit risk management techniques suitable with the environment in which a bank operates worth's to caution the bank's risk (Batra & Rundassa, 2016)

Currently, number of borrowers and amount of credit extension has dramatically grown which resulted in need to set stringent credit risk control systems. The aim of credit risk management system is to increase risk-adjusted rate of return by reducing risk exposures within acceptable parameters (Ahmadyan, 2018). Credit risk may be the present or future risk to bank earnings and capital occurred when the obligator fails to settle the contract as per the promise. Credit risk is the major challenge and the ability to tackle the problem determines commercial bank's financial stability (Mekuria, 2017; & Rundassa, 2019).

Researchers such as (Abera, 2018; Mihretu, 2019) have been conducted their study on the same topic of interest. They focused on the empirical relationship between credit risk and financial performance of commercial banks. However, they are not comprehensive regarding large loan disbursements and require further studies. Therefore, the primarily purpose of conducting the current investigation is to examine the extent to which extensive credit creation outraises credit risk that further has an adverse effect on financial performance of commercial banks in Ethiopia. Thus, this study helps bank manager to identify credit risk and throw down its effect that can hamper financial performance

1.2 Statement of the problem

In Ethiopia, commercial banks encounter numerous difficulties though there are regulations imposed by the Central Bank of the country. Credit risk is the most serious of all several problems having high potential for bank's financial performance to hinder in the course of their business (Mekuria, 2017; & Rundassa, 2019).

Now a days, with a view to become more accessible to the public, commercial bank branches are tremendously increasing year after year so does their customers (deposit or borrower) across the country. The expansion of bank branch may come up with the increment into of a large number of depositors that put their money into the chosen branch trustworthily. This makes the banks to have more funds to be accumulated in each branch. The known fact under this situation is that the commercial banks are highly motivated to disburse huge amount of the total fresh loan for their potential borrowers in the view of gaining interest income, the primary source of generating revenue that can enhance bank's profitability. However, the care the loan managers undertake in managing loan system and the default on behalf of the borrowers essentially determines loan success and bank performance. Abera (2013) as far as heavily concentrated customer deposit and quality of large credit extension concerned, banks in Ethiopia are still weak and requires further redirection to have sound risk bearing and loan management practices so as to improve financial performance in banking industry.

In line with aggressive branch outlet expansion, that makes banks to retain large deposit and offer huge loan granting, borrowers may experience defaults leading the commercial banks to have large amount of loan loss provision to cover that default. The higher loan loss provision, which is portion of the bank's profit, the higher the risk causing the financial profitability of the private commercial banks to trigger during that fiscal year. Typically, the more a particular loan is at default the more probability the commercial banks to be at liquidity risk (Bizuayehu, 2015).

Investigators such as (Abrha, 2019; Seid, 2016; Miheretu & Dinku, 2018) have conducted study to analyze the relationship between credit risk and financial performance of commercial banks. In this regard, researchers emphasized on bank specific, industry specific and macroeconomic factors to make analysis with little concern as to whether providing heavy loans to customers can have adverse effect on profitability. However, to the knowledge of pervious literature review,

still investigation is needed to disclose whether granting excessive loan to customers outraises credit risk that subsequently affects financial performance of private commercial banks in Ethiopia. This study, therefore, strives to examine to what extent excessive credit creation aggravates credit risk that in turn influence private commercial bank's profitability.

Furthermore, private commercial banks come into exist through the consent of incorporators with objective of earning and distributing profit to shareholders on one hand and supporting the economy on the other but not by the regulatory authority enforcement. Likewise, since good profitability is everything for them to profoundly make sound and continual economic contribution, credit risk has to be given valuable attention not to longer harm private commercial bank's profitability and gain the desired economic support (Belay, 2019).Therefore, it was additional aspect that motivates the researcher's attention to focus on private commercial banks in Ethiopia.

In addition, bank specific factors like loan loss provision to total asset ratios and nonperforming loan to gross loan, capital requirement risk factors still need further investigation to identify their influence on bank performance holding bank size controlled. The findings of this investigation enable management to devise stringent credit risk management strategies and policies that can protect commercial banks against profitability downturn and withstand shocks.

This study also laid down a base for researchers to conduct further in-depth investigation by extracting out unknown factors affecting loan investments for emerging commercial banks afterwards thereby bringing safe, healthy and stable financial system. It contributes to stockholders portraying the nexus between credit risk and profitability and banks to bring untouchable service to touchable service.

To this end, the report significantly contributes management to critically identify these days' fraudster and unethical customers that have sophisticated mechanisms to deceive the banking sector by increasing accountability within the institution.

1.3 Objectives of the Study

Research objective describes concisely what the researcher is trying to achieve on the given topic of interest and are comprehensive accomplishments in that they summarize what the researcher wishes to achieve through the project and provide a direction to the investigation. Research objectives are achievable, measurable, observable, time bounded and specific so that the overall study has never been beating around the bush rather to the point. All developments relating to the title of the research should be read and knowledge gaps are identified prior to framing research objective. Accordingly, this study has the general and specific objectives.

1.3.1 General Objective

In any of the researches there is only one general objective that summarizes and presents the central idea towards which the researcher would like to achieve with the project. As a result, the general objective of this study is to explore the effect of credit risk on the financial performance of private Ethiopian commercial banks covering the period (2011-2020).

1.3.2 Specific Objectives

Specific objectives intend to present what is to be researched in a more detailed manner during the study period and based on general research objective, this study has developed the following specific objectives that attempts:

1. To explore the effect of nonperforming loan to Gross loan ratio financial performance of private commercial banks.
2. To evaluate the effect of loan loss provision to total asset ratio on performance of commercial banks.
3. To examine the effect of capital adequacy ratio on commercial bank’s financial performance during the study period.

1.4 Research Questions

The purpose of the study is to examine the relationship between credit risk and financial performance of the selected private commercial banks in Ethiopia. Accordingly, to attain the above objectives of the study the researcher is to answer the following research questions are appropriately.

1. What is the effect of nonperforming loan to gross loan ratio on financial performance of private commercial banks?
2. What is the effect of loan loss provision to total asset ratio on performance of commercial banks?
3. What is the effect of capital adequacy on commercial bank's financial performance during the study period?

1.5 Significance of the study

The purpose of this study is to scrutinize the effect of credit risk on the financial performance of privately-owned commercial banks now operating in Ethiopia covering (2011-2020). Dearth of investigations have been carried out on the same topic of interest, this implies that credit risk is the prominent and most challenging issue with respect to financial service sector in general and banking industry in particular around the globe. It is the largest chunk of revenue, if successful, in the form of interest income. Conversely, it is the largest chunk of bank failure if unsuccessful in the course of doing core banking business. Therefore, the finding of this study enables to develop a framework for measuring and evaluating credit risk of banks to remain healthy in financial condition.

The report of this study is expected provide reliable information to management, policy makers, investors and stakeholders helpful in improving financial performance through mitigating credit risk. In addition, this investigation can empower others to play their fair share. For instance, professional of accounting and finance and students of business and economics to clearly understand the correlation between credit risk and financial performance of commercial banks in Ethiopia, whether they are private or public in their nature of ownership, and to tackle credit risk problems.

1.7 Scope of the study

This study is conducted on privately owned commercial banks in Ethiopia. Currently, there are sixteen private commercial banks operating in the county and investigation takes seven out of the total based on random sample techniques. A ten year data covering from (2011-2020) has been analyzed to solve the problem.

1.8 Limitations of the study

This Study focused only on the investigation of financial performance aspect ignoring nonmonetary performance aspect such as activity performance of the banking sector. The descriptive and regression analysis were based on bank's audited financial statements. However, due to their nature of sensitivity as well as confidentiality, some information was not accessible to anyone except bank use and was the major limitation to this investigation.

CHAPTER TWO

LITERATURE REVIEW

OVERVIEW

In this chapter, related literatures were reviewed and literature gap was identified to prepare an organized report that further contributes to other journals. To do so, the previous theoretical and empirical literatures related to the effect of credit risk on financial performance of private commercial banks in Ethiopia were summarized in a manner that helps to the problem.

2.1 THEORETICAL LIERATUR

2.1.1 Risk

J (2017) risk is inherent in core banking business, but controlled by mechanisms of proper identification, analysis, evaluation and measurement processes. Any risk of the commercial bank has a potential to hinder continual growth of performance, as a result everyone within the financial institution is accountable in managing risk exposures by discharging his or her responsibility in their day to day operations. There are various types of risks to the financial institutions, such as market risk, interest rate risk, and credit risk, liquidity risks that have adverse effect on operations of financial institutions.

Likewise, business risks such as changes in business environment, industry and technology are not included in independent risk control process and the bank's policy is to monitor through strategic planning process. Risk can be described as uncertainty of any outcome. It is generally classified in to two major types such as pure risk (risk related to loss due to fire, accident and food) and speculative risk (which relates to loss in case of business failure).Risk contains many possible outcomes and can determine the likelihood of event occurrence. It known that risk bearing an integral part of management's activity and should be taken intelligently and necessarily. The most common risks that financial institutions are subjected are currency risk, interest rate risk, operational risk, market risk, liquidity risk, capital risk (Kegninkeu, 2018).

2.1.2 Credit risk

Credit risk is evaluated by scrutinizing the financial performances of commercial banks attempting to minimize the effects come as a result of delays or nonpayment of interest and

principal on maturity date. All times, financial success and stability of commercial banks relied on the possession of sound credit risk control. For this reason, Commercial banks should know the need to identify measure, monitor and manage risk as well as decide how much to hold ad a capital reserve enough to protect against depositors funds and compensate risks being incurred. Moreover, credit risk plays plenty of roles on financial performance of commercial banks due to the fact that much of bank's revenue accrued from credit from which interest is obtained (Bhattrari, 2016).

Credit risk management in banking core business activity begins with stringent credit policy and efficient framework for controlling risk. Accordingly, for banking industry to longer existence and expand managing credit risk is given great emphasis due to the fact that larger credit risk is resulted from clients default (Ayalew, 2018).

According to Ozurumba (2016) Loan and advances the bank granted to counterparties are regarded as risky assets. This is due to the fact that they belong to depositors and risk arises where there is a failure on behalf of the borrowers, leading to low bank liquidity as monies available in bank may not be enough to cover withdrawal demand of depositors. This shows granting massive loan by banking industry is regarded as high-risky business. Therefore, the success as well as failure of this kind of core banking activity is dependent on the subject matter of risk and uncertainty.

2.1.3 Credit Risk Management

As it has been outlined by Assfaw (2018), credit risk is the probability of default as a result of counterparty's failure in settling obligations; credit risk management is the practice of cutting down the frequency of loan loss due to borrower's failure to effect payments at a given point in time. Credit risk management one of the main banking business activity and because of this carefully managing its practice is essential for the prosperity of commercial banks. Often times, the banking industry constantly faced with risk in relation to the core banking business and for this reason risk bearing is the most common activity in banking sector and hence banks should practice effective and adequate credit risk management process to stay in healthy financial status and withstand any shocks.

The practice of credit risk management system is not the same in all banks since the type and complexity of loan transactions varies each other. However, sustainable credit risk environment, appropriate credit administration and monitoring processes, sufficient credit risk control and clear credit criteria are credit risk management practices that all banks share in common. Likewise consolidation of customer's data, active loan portfolio management, centralized decision making efficient tool for credit risk exposures are practiced by different banks but accordingly(Ayalew, 2018).

Monitoring and controlling risks is performed primarily based on the limits established by banks. These limits reflect business strategy, market environment; the level of risk the bank has been accepted. Besides, the bank's policy is to measure and monitor the overall risk bearing capacity in relation to total risk exposure activities (Assfaw ,2018). Risk management is the identification, evaluation and prioritization of risks followed by coordinated and economical application of resources to minimize, monitor and control the probability or impact of unfortunate events or to maximize the realization of opportunities. For this reason, it is crucial to apply and maintain risk management procedures.

Credit risk is a serious challenge to the lending institution and credit risk management saves them from failure. The very reason to this is that sound credit decision and the loan quality are considerably paramount in determining the downfall or upward growth of these lending institutions (Ozurumba, 2016).

Ayalew and Kegninkeu (2018) the economic as well as social wellbeing of any nation is relied on the financial service institution. In this regard, the banking industry takes the lions' share through allocation and mobilization of economic resources of a country by which funds are transferred from surplus units to fund deficit units for investment. According to them, although there have been a serious financial threat due to customers delay or nonpayment of interest and principal as they due, still the economic condition of once country can be easily revealed under a summarized annual report of commercial bank's performance. Since credit directly affects performance, it is imperative for commercial banks to develop forecasting abilities regarding risk limit gross loan portfolio to diversify risk and make stringent loan extension analysis concerning to customer repayments/ non-repayment of their obligation (Kodithuwakku, 2015).

Besides to the intermediary role, the commercial banks provide reward to their shareholders as a result of better financial performance motivating them in making additional investment thereby bringing economic growth (Seid, 2016).

Konovalova et al. (2016) granting credit to individuals or institutions having legal personality is the chief activity of commercial banks. It may weaken or strengthen the bank's performance depending on defaults or success it involved in the course. In this regard, undertaking quantitative assessment and evaluation of credit risk and worthiness of the counterparties is most relevant for all banks.

Setting a banking relationship and offering loans to customers are associated with plenty of benefits, but also credit risks. It is therefore crucial for the lenders to proudly identify how and for what purpose the loan is used and how they get it back. The credit risk management procedures must also be able to thoroughly evaluate analyzes, assess, prioritize, categorize and monitor all customer risks. Furthermore, the lenders should emphasize on the financial performance of the borrowers to know figures related to net income and net assets (Ozurumba, 2016).

Kagoyire (2016) the primarily condition for sound credit risk management is the ability to wisely and efficiently manage borrowers credit lines. The lenders are to focus on the counterparty’s credit history, repayment capacity and willingness in order to reduce exposure to nonperforming loans and over reserves. Credit risk management practice begins with loan extension and continues until the loan is fully repaid back. It follows that good lending principle to the large extent is concerned with assuring the customers’ ability to make full payments as per the agreements. However, if this is not put in to place the profit from the interest earned come to being reduced or might be used to cover loan loss provisions when customers get in to default. The fundamental purpose of credit risk management is to protect lenders from getting in to financial hardship through managing financial debts and optimizing operational cash flows. To attain this, desired goal should be supported by policies and procedures helpful to keep quality of the loan.

2.1.4 Risk Mitigation

Oftentimes, possessing collaterals and guarantees for the commercial banks to grant loan are among the various strategies that most banks around the globe use to minimize credit risks. However, the counterparties ability and strengths of paying back the interest and principal they have been borrowed is given great emphasis beyond risk mitigation techniques. Banks are mindful in that the value of the collateral might be impaired led to the diminished recoverability of credit (Noman et al., 2015).

Similarly, the commercial banks are required to well understood and structured policies and procedures regarding the acceptability, ongoing valuation, enforceability and realization of the collateral while with respect to guarantee, banks need evaluate the level of coverage provided in relation to credit quality and legal capacity of the guarantor. Nevertheless, it has been noted that commercial bank's agreements with the third parties including the government as a strategy of risk mitigation are sound and legally enforceable

2.1.5 Assessment of banks credit risk management

Jemutai (2016) management teams carry out the duty of conforming and periodically reviewing credit strategies and credit policies. The plan is able to show the banks' ability to bear risk and the level of profit it projects to achieve for incurring various risks. Similarly, executives have the responsibility of developing policies and procedures for identifying, monitoring, measuring and controlling credit risks based on credit risk strategies that the board directors have been confirmed. These policies and procedures are expected to solve credit risk problems that all banks evolve at both individual credit and portfolio level.

Zemedkun and Abisola (2019) it is essential for banks to analyze evaluate and handle credit risks that are inherent in all products and activities and make sure that any additional credit risks are under control of risk management mechanisms prior to the advance approval by the respective board directors or appropriate committee. Banks need to operate in a well-known credit extension environment, including clearly identified bank target market, stringent understanding of obligators, and objective structure of credit and source of repayments. Banks are to set maximum credit limit at the level of individual borrowers, and counter parties. It is always

essential for commercial bank clearly established in place for approving additional credits as well as amendments, renewal and re-financing of existing credit (Mulugeta, 2018).

2.1.6 Loan Appraisal

Uwuigbe et al (2015) people may come across what is known as credit appraisal. Loan appraisal basically mean that assessing a particular loan application or proposal in a thorough manner in order to gauge the repayment ability of credit applicant. Accordingly, lenders conduct loan appraisal chiefly to make sure that the bank gets back the money that it grants to its counterparties. Whether one applies individually or as a corporate entity, a lender always conducts a detailed and systematic credit appraisal process.

Ayalew and Assfaw (2018) the credit appraisal process before giving a loan to entities is comprehensive in nature as it appraises or evaluates management, market, technical, and financial elements. No lender approves and sanctions anybody's personal loan application instantly without an evaluation. It is absolutely important for a lender to carry out a credit appraisal process in order to ensure that the borrower has the capacity to repay the entire loan amount on time without missing any payment deadlines. This is very crucial for a bank as this determines the interest income and the capital of the bank.

The repayment behavior of a borrower directly affects the performance of the bank. Both banks and non-banking financial institutions utilize credit appraisal procedures before approving a personal loan application or any other loan application. Each lender has its own techniques for performing credit appraisal processes. A lender needs certain norms, rules, and standards to assess the creditworthiness of a particular loan applicant. If a borrower has a high creditworthiness, there is high probability to accept his or her loan application by the bank. A credit appraisal is done to avoid the risk of default on loans (Bizuayehu, 2015).

2.1.7 Credit Administration policy

Credit administration is important in maintaining the safety and effectives of the banks. Once the loan is granted to the customers, it is the responsibility of the bank to ensure that credit is properly maintained. This may incorporate updating credit file, getting recent financial information, forwarding out renewal notice and preparing various documents such as loan

agreements. In larger banks, the responsibility for credit administration may be divided among different departments, but in smaller banks these responsibilities may be assigned to an individual. Where individuals perform such functions a custody of key documents entering credit limit to a computer data base, they should report to managers who are independent of business origination and credit approval process.

However, when this is practically complex, banks should have sound mechanisms to reduce related risks. Therefore, to develop good credit administration arrangement, banks should ensure the efficiency and effectiveness credit administration operations, accuracy and timeliness of information, effectiveness of duty segregation, adequately controlling office procedures and compliance with prescribed policies and procedures (Njeri & Kagoyire, 2016)

2. 1.8 Risk Tolerance of banks

Risk tolerance is the amount that the banks can withstand. Risk is inherent and adversely impacts bank's profitability measurements such as return on asset, return on equity and net profit margins. Risk has a potential to deter banks from future progressive journey (Serwadda, 2018).

Abisola(2019) risk need management up to the level that allows the bank feasible economically and accomplish its core business targets, while doing business in a safe, sound manner, complying with all applicable regulations, generate revenue to stockholders that meet or exceed their expectations. Banks set risk tolerance annually in a thorough manner taking into consideration bank risk environment, qualified strategic planning, risk appetite, interest rate and liquidity. The bank can amend these areas where necessary.

2.1.9 Bank performance

Yuanita and Belay (2019) bank financial performance is a complete evaluation of company's overall standing in categories such as assets, liabilities, equity, expense, revenue and overall profitability. For internal users, financial performance is examined to determine their respective companies' well-being and standing among other benchmarks. Financial performance tells the investors about the general well-being of the firm. It's an indicator of economic health and the job its management is doing.

Efficient financial performance of the banking industry plays an important role as it is the major financial source that injects the county's economy. In this regard, measuring and analyzing the banking industry performance is significant.

Guindos (2019) stated that as profits are the first line for bank to withstand any negative shocks, it is clear that profitability matters their financial health and stability. In addition, retained earnings are the major sources of capital enabling banks to build strong buffer other losses.

To place what is aforesaid above in practice, this study evolves to express bank financial performance quantitatively by employing performance metrics of return on asset (ROA) and return on equity (ROE) to scrutinize the relationship between bank profitability and credit risk as measured in terms of nonperforming loan, loan to deposit ratio, capital adequacy ratio and bank size.

2.1.10 Bank performance Measure

Return on Equity (ROE) ratio: represents the amount of income the banking sector generates during the operational period in proportion to total equity employed. It is the amount of profit the stockholders expect from their investment and hence a bank with higher return on equity is able to obtain better profit (Dinku, 2018). It is an indicator of how much a bank is profitable as compared to its total equity. It provides a manager, investor, and analyst clear idea as to how efficient a company's management is using assets to generate earnings. Return on equity is usually expressed as a ratio where the higher the ratio, the better bank performance and vice versa (Hargreve, 2021).

2.1.11 Credit Risk measures

Nonperforming loans (NPL): Non-performing loan is a probability of loss which requires provision. The amount of provision is "accounting amount" which can be further subtracted from the profit. Thus high NPL increases the provision while reduces the profit (Yuanita, 2019).

Mekuria (2017) granting loans to financially strong borrowers will mitigate the management's risk bearing activity this is due to the fact that the likelihood occurrence of non-performing loan is low in relation to applicants with weak financial performance. Non-performing loans (NPLs)

continues to put pressure on commercial banks, playing a detrimental role in profitability and the overall financial health of the banking infrastructure.

In general, the management of NPLs is made difficult due to a variety of reasons including lack of a standard, accepted definition of NPLs, and no strong reporting frameworks, lack of any standard valuation methodology whereby financial institutions can make provision for losses arising from NPL resolution, lack of motivation for banks and financial institutions to understate their NPLs in order to avoid reputational risk of facing higher funding cost on financial markets, unwillingness of banks to sell NPLs because of the costs associated with such an exercise, which could add to the NPL losses. This in turn could hurt their capital adequacy (Batra & Rundassa, 2016)

Loan loss Provision to total asset ratio (LPTAR): In banking industry, the usual practice is that banks are required to keep certain amount of money as a loan loss provision to protect themselves against future loan defaults thereby ensuring sound financial condition. Loan loss provision is parameter measure as to whether banks maintain credit quality and is a cushion for nonperforming loan if defaults happened in banking practices (Skhvediani et al., 2021).

Capital Adequacy Ratio (CAR): The minimum amount of regulatory capital that banks must hold to absorb reasonable amount of loss. Accordingly, in Ethiopia, banks have to maintain capital to risk weighted asset ratio 8% at all times the risk weighted assets being calculated as per the provisions of Directive No SBB/9/95 issued on 18 August 1995. Capital includes capital contributions, retained earnings, legal reserve and other reserves to be approved by the National Bank of Ethiopia (NBE directive).

Control Variable

Bank size (BS): The bank size is measured by the aggregate of its assets. In order to avoid the collusion with the total assets in the dependent variable it become more appropriate for the researcher take the natural logarithm of total asset as proxy to be consistent with other ratios. This variable captures economics or diseconomies of scale in banking industry and controls cost difference in products risk diversification based on size (Abrha, 2019).

Belay (2019) banks size associated with the age of banks in Ethiopia is significant and concludes in her study that the longer the banks stay in the industry the more exposure to credit risk management due to the learning curve effect.

2.2 EMERICAL LITERRATURE REVIEW

The empirical literature review undergoes to summarize the findings of some related studies.

Abera (2018) examined the relationship between credit risk and performance of private commercial banks in Ethiopia. A panel regression was used to analyze a 14 year data of six private commercial banks for a period covering (2003-2016). The study employed bank specific, industry specific and macroeconomic factors where the data was obtained from MoFED and audited financial statements. The performance indicators used were return on equity and return on asset whereas GDP, inflation, bank size, capital adequacy ratio, loan to deposit ratio, cost per loan asset ratio nonperforming loan ratio were used as credit risk indicators. The result of the study revealed that non-performing loan ratio, cost per loan asset and capital adequacy ratios adversely affect performance, but GDP and loan to deposit ratio have positive significant correlation and inflation rate has insignificant relation with bank performance.

Abrha (2019) has conducted his study on impact of Credit risk Management on bank performance of Ethiopian commercial banks. Primary and secondary data were used for eight banks. Return on equity was dependent variable while capital adequacy ratio, GDP, Inflation rate, loan and advances deposit ratio, bank size and non-performing loan ratio are explanatory variables. The result indicated that all the predictor measures influence bank performance. But, it contradicts study conducted by (Abera, 2018) in that inflation rate has no significant influence of on bank performance.

Bizuayehu (2015) examined the relationship between credit risk and performance of commercial banks in Ethiopia. A panel regression was used to analyze 11 year data of eight commercial banks for a period covering (2003-2013). The study employed bank specific, industry specific and macroeconomic factors where the data was obtained from MoFED and audited financial statements. The performance indicators used were return on equity and return on asset whereas bank size, capital adequacy ratio, loan to deposit ratio, nonperforming loan ratio were used as credit risk indicators. The result of the study revealed that non-performing loan ratio, and capital

adequacy ratios adversely affect performance, loan to deposit ratio and bank size have positive significant, but GDP, inflation rate has insignificant relation with bank performance.

This contradicts study conducted by Abera (2018) who found that has positive significant influence; bank size has no significance on bank profitability.

Awoke (2014) investigated the impact of credit risk on performance of commercial banks in Ethiopia. The researcher found out that the selected parameters of credit risk; provision to loan, size, loans and advances to total asset credit administration (cost per loan asset) are significant to the study as they have significant influence on bank performance.

Isanzu (2017) studied the impact of credit risk on the financial performance of Chinese commercial banks. The researcher has obtained data from secondary sources and include five largest commercial banks in the study covering the period of seven years(2005 -207). Capital Adequacy ratio, nonperforming loan, loan impairment charge and loan impairment reserve were used as a measure of credit risk whereas return on asset was used as indicator of financial performance. The findings of the study revealed that Nonperforming ratio adversely affects financial performance while capital adequacy ratio affects financial performance positively. Loan impairment charge and loan impairment reserves have no influence on financial performance of Chinese commercial bank.

Bogale (2018) has conducted research to analyze the effect of credit risk on profitability and lending decision. Audited financial statements were used as secondary sources of information and thirteen year data from 2005 to 2017 for seven selected Ethiopian Commercial Banks was used. The study used return on asset and return on equity as a performance indicators while nonperforming loan to total loan, loan loss provision to total asset and loan loss provision to total loan ratios were used as a credit risk measures. The finding of the study showed that nonperforming loan ratio has adverse significant effect on return on equity (ROE) and Return on asset (ROA) while loan loss provision to total loan and loan loss provision to total asset have insignificant relationship with return on equity (ROE) and Return on Asset (ROA) and loan loss provision has adverse effect in lending decision (Mihiretu, 2018)

Kayode et al. (2015) has investigated credit risk and bank performance in Nigeria. They used eighteen years secondary data covering a period of 2000-2017 from six Nigerian banks. Return

on Asset was used as a performance measure while Nonperforming Loan to total loan, loan loss provision to total loan and Loan and advances to total assets were used as explanatory variables during the study. Their findings revealed that Nonperforming loan to total loan, loan loss provision to total loan ratios have significant effect on bank performance but negatively correlated. However, impact of loan loss provision total loan (LLPR) on financial performance is inconsistent with (Bogale, 2018) on the same issue. Loan and advances to total asset ratio is positively correlated and has positive influence on bank performance as measured by return on asset. This result is consistent with (Awoke, 2014) who conduct investigation on the same area.

Gizaw et al. (2015) they have empirically investigated the relationship between credit risk and profitability performance of Ethiopian Commercial banks. The Study used secondary data from audited annual financial reports of 8 sample commercial banks. A 12 year (2003-2014) data was analyzed employing multiple regression models. The researchers have considered Return on Asset (ROA) as the explained variable where nonperforming loan to total loan ratio (NPLR/TLA), Loan loss provision ratio (LLP/TLA), Loan and advance to total deposit ratio (LA/TD) and capital adequacy ratio are proxy variables to credit risk. Their findings revealed that NPLR adversely affects bank financial performance. This is also consistent result with (Adeyefa et al., 2015) who conducted research on the same issue. LLPR positively affects financial profitability of commercial banks but LDR and CAR have no relationship with financial profitability of commercial banks.

2.3 Summary of literature gap

Up to the best researcher knowledge, many researchers have been conducted their investigation on the same issue and provide suggestion on the relationship between credit risk and financial performance of commercial banks at different times, however, they are not comprehensive large loan disbursement and require further studies. Accordingly, large loan extension to customers still needs further research. Therefore, the primarily purpose of conducting the current investigation is to examine the subsequent effect of granting heavy customers loan on financial performance of commercial banks in Ethiopia.

2. 4 Conceptual framework of the study

The purpose of the study is to analyze the relationship between credit risk and performance of private commercial banks in Ethiopia. In most stated existing literature reports, bank performance measured in terms of Return on Asset and Return on Equity are affect by Nonperforming loan to gross loans ratio, loan and advances to total deposit ratio, capital adequacy ratio and bank size. Therefore, based on the objective of the paper, researcher has developed the following conceptual framework for this study. This conceptual model is framed to summarize the relationship of the explanatory factors and explained variables included in the study.

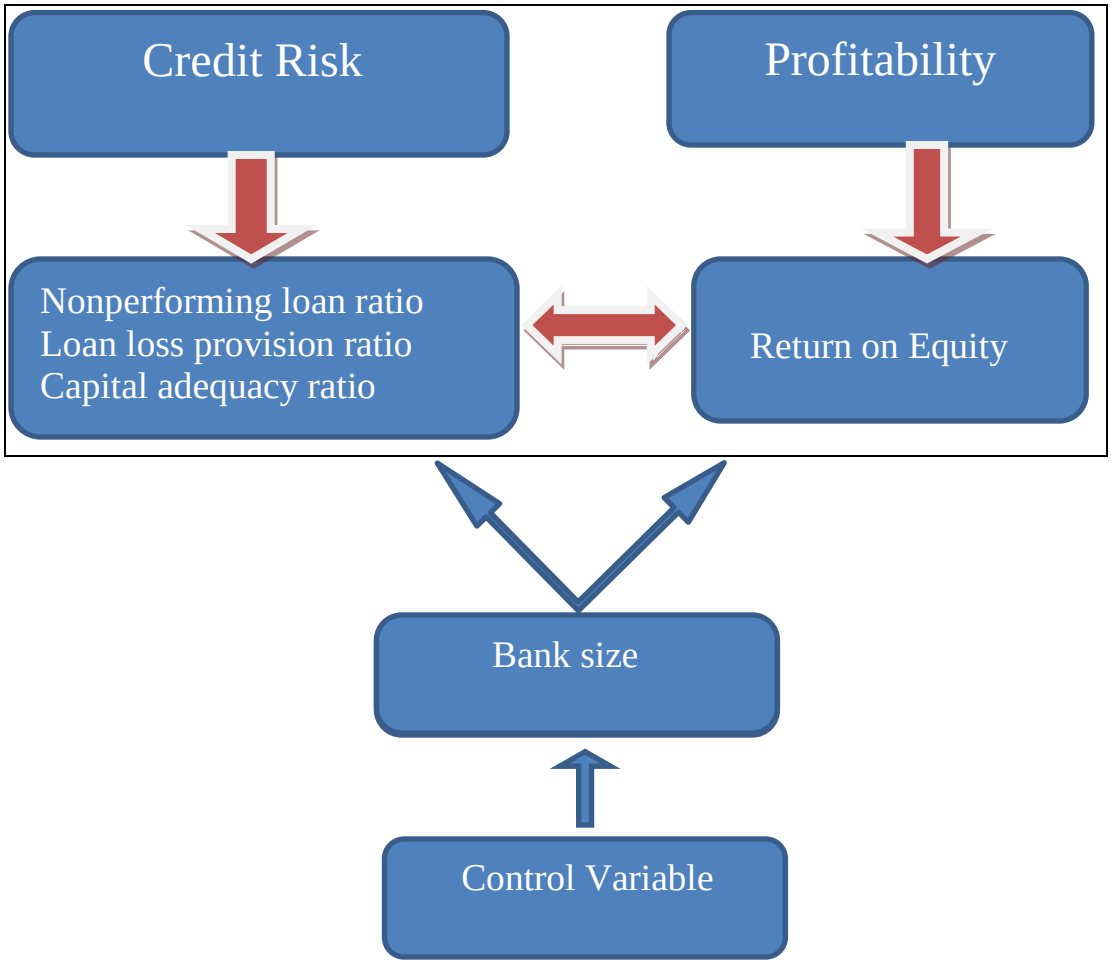


Fig. 2.1 schematic diagram of the study
(Source: Author's construction)

CHAPTER THREE

RESEARCH METHODOLOGY

OVERVIEW

Research methodology is a way to solve research problem systematically and to fulfill research aims. Accordingly, this chapter highlights the methodology through which the research is conducted, the target population, the research area; method of data collection and methods of data analysis.

3.1 Research Approach

As it is already stated in the previous chapters the purpose of the study is to analyze the impacts of credit risk on financial performance of privately-owned commercial banks in Ethiopia. The data is purely quantitative and is more preferable for the researcher to employ quantitative research approach to solve the problem.

3.2 Research Design

Research design is the master plan that the researcher has chosen to integrate the various components of study in coherent and logical way so that the research objective is attained as unambiguously as possible; it constitutes the blueprint for collection, measurement and analysis of the research data. In social science research, getting evidence relevant to the objective of investigation generally entails specifying the type of evidence needed to test a theory, to evaluate a program, or to accurately describe the phenomenon. However, researchers that start doing investigation without having adequate information needed to solve research problem beforehand will go down to weak and unconvincing conclusion.

There are different types of research designs (such as descriptive, exploratory, explanatory case study and descriptive longitudinal) every researcher uses to address their research questions. The selection and implementation of either of these research designs therefore depends upon the nature of data and the objective of research to be conducted.

The main aim of current investigation is to explore the impacts of credit risk on the financial performance of private commercial banks in Ethiopia. Hence, it is clear that there is a cause-effect relationship between the explanatory and explained factors of the study. Therefore, for aforementioned reason, causal research design (also known as explanatory research design) is most appropriate to address the stated research problem in this study.

3.3 Nature and sources of Data

To achieve the research objectives, data was collected from secondary sources of data which are published and audited annual financial reports of sample private commercial banks in Ethiopia covered under the study period of (2011-2020). The data are both time-serious and cross sectional in nature. For this reason, a panel data set is applied to estimate the impact of credit risk on financial performance of commercial banks. In addition, other relevant supporting information has been gathered from official websites of Central Bank of the country.

3.4 Population and Sample Size

This investigation is based on the data of private commercial banks in Ethiopia. Therefore, the total number of privately owned commercial banks in Ethiopia is obviously the target population.

According to the recent publication of the National Bank of Ethiopia there are 16 private commercial banks operating in the country. These are Awash Bank (AB), Bunna International Bank (BIB), Dashen Bank (DB), Nib International Bank (NIB) Abay Bank (AB)United Bank (UB), Lion International Bank (LIB),bank Of Abyssinia (BOA), Zemen Bank (ZB), Addis International Bank (AdIB), Wegagen Bank(WB), Cooperative Bank of Oromia (CBO), Oromia International Bank (OIB), Berhan International Bank (BBI), Debub Global Bank (DGB), Enat Bank(EB) (www.nbe.et). Using random sampling method seven banks such as are Awash Bank (AB), Dashen Bank (DB), Nib International Bank (NIB), United Bank (UB), Bank Of Abyssinia (BOA), Nib International Bank (NIB), Lion International Bank (LIB) are included in the sample to provide a convincing report. This indicates that the sample size constitutes approximately 44% of the target population as the study population. Data for 10 years were taken to solve the problem.

3.5 Sampling Method

In statistics, Sampling is the selection of subset of individuals from within a statistical population to estimate the characteristics of the whole population. So, as far as the sampling method to be employed in this study is concerned; it has followed random sampling technique.

Accordingly, non-purposive sampling technique has been used for the study in selecting samples members from the target population.

3.6 Method of Data Analysis

This investigation is quantitative in its nature and analysis all the way is based on the historical data. Accordingly, tools for the study are selected as needed by the study and data nature. In this regard, for the purpose of scrutinizing data different risk ratios such nonperforming loan to Gross loan ratio and loan, advances to total deposit ratios, capital adequacy ratio and bank size measured by the natural logarithm of total assets are analyzed by means of descriptive statistics. Accordingly, under descriptive statistics, mean, median, maximum, minimum, and standard deviations of the historical data are measured to describe the characteristics of the data under the study.

Additionally, the study adopted econometric model, panel data regression and ordinary least square method to identify and measure the effect of credit risk on financial performance of the commercial banks using STATA version 14 econometric software packages for the study. Various diagnosis tests including hetroscedasticity, normality, autocorrelation and multicollinearity are also to be conducted in the study to make sure that the data collected from the sample banks fit with the model. All these data tools help to analyze ten year (2011-2020) historical data collected from sample banks to provide sound and convincing conclusion about the given population.

3.7 Study Variables

The main objective of the study is to examine the relationship between impact of credit risk and financial performance of commercial banks in Ethiopia. In this regard, explanatory and explained variables are used to analyze the aforesaid objective of the study.

3.7.1 Independent Variables

These variables have explanatory power of the explained variables in the study. The following are independent variables used in the study.

Loan Provision to Total Asset Ratio (LPTAR): This ratio is also known by credit deposit ratio. It can be used to explore credit risk and liquidity taking in to account the relative amount of loan and advance to deposit under the study period. The ratio can be expressed as:

$$\text{LPTAR} = \frac{\text{Loan loss provision}}{\text{Total Asset}}$$

Capital Adequacy ratio (CAR): The amount of capital that the bank should have to absorb unexpected future loss. It can also protect depositors. The ratio can be expressed as:

$$\text{CAR} = \frac{\text{Total Equity}}{\text{Total Risk Weighted Assets}}$$

Nonperforming Loan: A nonperforming loan (NPL) is a loan in which the borrower has not made required repayments of principal and interest for the last 90 days. When the bank has huge volume of nonperforming loan in its balance sheet, it poses cash flow problems for the bank since it is no longer earning income from its credit business.

Non-performing loan to Gross loan ratio (NPLGLR): The ratio can be expressed as:

$$\text{NPLGLR} = \frac{\text{Nonperforming Loan}}{\text{Gross Loan}}$$

Control Variable

Bank Size: Measures the total asset of the bank during the study period and natural log of total bank asset is its proxy. The ratio can be expressed as:

$$\text{BS} = \text{Log(TA)}$$

3.7.2 Dependent Variable

Dependent variable is a variable being tested and measured in an experiment and dependent on the explanatory variables. In this case, bank's performance is measured in terms of Return on Equity.

Return on Equity (ROE): This is a most commonly used performance measure in literatures. It represents the proportion of banks equity in relation to the total bank asset. Often times, the higher of to asset ratio means that the largest portion of bank's asset is funded by equity and banks are low levered. The ratio is expressed as:

$$\text{ROE} = \frac{\text{Net profit}}{\text{Total Equity}}$$

3.8 Model Specification

Based on the aforementioned dependent and independent variables, the following two econometric models are developed. Both models are expected to demonstrate the relationship between credit risk and financial performance of commercial banks. The models thus would be:

$$\text{Model: } \text{ROE} = \alpha + \beta_1 \text{CAR} + \beta_2 \text{NPGLR} + \beta_3 \text{LPTAR} + \beta_4 \text{BS}_{\text{Control}} + \varepsilon_i$$

Where; α = the constant term

β = the coefficient of explanatory variables

ε_i = disturbance term

LPTAR=loan provision to total asset ratio

CAR = Capital adequacy ratio

NPLGLR = nonperforming loan to gross loan ratio

BS = Natural logarithm of total asset

To this end, by applying the above econometric models data are to be analyzed and discussed to reach at certain findings which in turn help the researcher to provide general conclusions and possible recommendation about the original project work.

CHAPTER FOUR

4. DATA ANALYSIS AND RESULT DISCUSSTION

INTRODUCTION

As far as the impact of credit risk on the financial performance of private Ethiopian commercial banks, numerous previous studies have been reviewed and knowledge gap on the on the area was well identified. Usually, research is understood from societal problem-solving instrument perspective and accordingly objectives that have motivated the researcher to conduct an investigation on a specific epistemology need to be attained, research questions designed are required to be responded and the hypothesis developed should be tested in appropriate manner whether to reject or accept the null or alternative hypothesis the study. Therefore, to meet all the above the researcher has already specified research design and formulated an empirical study model in the previous section.

In the latter chapter, a ten year (2011-2020) data collected from seven randomly sampled private Ethiopian commercial bank's audited financial statements were presented, analyzed using descriptive statistics, regressed under multiple linear regression analysis (using STATA version 14 software packages) and interpreted in the manner that it was clear to the reader. Accordingly, this part has contained descriptive statistics in the first section followed by correlation, multicollinearity and results of regression analysis including hetroskedastesity, and normality) are illustrated and discussed in the last section of this part.

4.1 Descriptive Statistics

Descriptive Statistics were used to describe the basic features of the data in the study. They provide simple summaries about the sample and measures. Together with simple graphics analysis, they form the basis of virtually quantitative analysis of the data. With the descriptive analysis the researcher simply described what was and what has been demonstrated by the data. The writer of this investigation had presented descriptive analysis of the study variables in a manageable form such that others could be able to see and understand the report. The variables included study was to quantitatively measure credit risk and financial performance of the commercial banks in Ethiopia. To attain this, capital adequacy ratio, non-performing loan ratio and loan provision to total asset ratio were proxies of credit risk with a potential to predict return on equity the most preferable measure of commercial banks' performance. Since the very nature

of the data was to quantitatively estimate the relationship between credit risk and profitability of private commercial banks, explanatory research design and random sampling techniques were appropriately used.

In addition, bank size as measured by the natural logarithm of banks' total asset was used as controlling parameter to hold other things constant (i.e. as purposive sampling technique was inappropriate to use in the sample selection). Accordingly, the descriptive statistics of seven randomly selected private commercial banks, such as Lion International Bank (LIB), Bank of Abyssinia (BOA), Bunna International Bank (BuIB), Dashen Bank (DB), United Bank (UB), Awash Bank (AB), and Nib International Bank (NIB) been has analyzed using a descriptive analysis table below. The easily manageable and summarized table contained mean, standard deviation, minimum and maximum values of the explained, explanatory and the controlling variables.

Table 4.1 Descriptive Statistics of dependent, independent and control Variables covered under the study period.

Variable	Obs.	Mean	Std. Dev.	Min	Max
ROE	65	.2020692	.048468	.1235	.323
CAR	65	.1579554	.0555438	.09	.4016
NPLR	65	.0268954	.0266475	0	.21
LPTAR	65	.0083554	.0030102	.0014	.016

(*Source*: The Researcher's computation through STATA Software packages)

Return on Equity (ROE) calculation measures how efficiently the commercial banks' are generating income from equity investments of their stockholders. As per the above table, return on equity (ROE) proxy of bank performance ranges from 12.35% to 32.3% where the standard deviation was 4.85%. The smallest standard deviation from the mean was advisable and acceptable. In this case, the standard deviation value 4.85% was lowest relative to mean value of return on equity (ROE) was 20.21% and this revealed those commercials were operating very efficiently.

Capital Adequacy Ratio (CAR) is a measure of how much capital the bank has available reported as a percentage of bank's risk-weighted credit exposures. The purpose is to establish that banks have enough capital reserve to handle certain amount of losses, before being at risk of becoming insolvent. According to the above table minimum capital adequacy was 9% and the maximum value was 40.16%. Its standard deviation 5.55% was the lowest comparing to the mean value of 15.79% which was greater than almost by two-fold of what has been legally required 8%. This situation indicated that during the study period commercial banks' were financially strong enough to withstand any unforeseen losses and financial downturn.

Nonperforming loan to gross loan ratio (NPL) Nonperforming loan represents sum of borrowed money whose scheduled payments have not been made by the debtor over relevant range of time. Commercial banks are required by National Bank of Ethiopia to report their nonperforming loan in each quarter of the operational year. It is one of the parameter that can aggravate credit risk of the commercial banks where they have to employ sound management policy to boost their financial performance.

According to the descriptive information, the minimum value of nonperforming loan was zero and maximum value was 21%. However, the mean and standard deviation values were 2.68% and 2.66% respectively. The very close distance between these values showed that variation is too little. This certainly implied that low quality of loan and very much poor credit administration policy during the study period. Therefore, commercial banks are required to be hard working in terms of revising loan management policy and improving loan quality to mitigate loan default thereby boosting their profitability. Nevertheless, commercial banks were still in operation, this is due to the fact that loan portfolios fewer than the industry average of 6% nonperforming loan are deemed to be healthy.

Loan loss Provision to Total Asset Ratio (LPTAR) one of the ways banks make money is of interest payment they receive from the loan given out. However, if the loans are not repaid or interest payments are not as high as expected, banks' earning ability can take a hit. To cover those losses, banks need to make a loan loss provision. They are best bank's estimate what percentage of the loan may not get paid back. From descriptive statistics of the selected commercial banks above, the author got 1.4% minimum statistical value whereas 1.6% was the maximum value. It had standard deviation 0.3% with the mean value of 0.84% indicated that

commercial banks were well protected against future losses and still are able to provide services to other borrowers and depositors.

4.2 Correlation Analysis of the study variables

Correlation analysis in research is statistical method used to measure the strength of linear relationship between two variables and compute their association. Correlation analysis calculates the level of changes in one variable due to changes in another variable. The higher correlation the strong relationship between the two variables, while the lower correlation the poor correlation between the two variables. A positive correlation between the variables means that the two variables move in the same direction and vice versa while zero correlation implies that the variables are not correlated one variable does not affect the variable. Possible values of correlation coefficient ranges from -1 to +1, with -1 indicates perfect negative correlation (slopping downward), whereas correlation coefficient of +1 shows a perfectly positive linear correlation (slopping upward), and a correlation coefficient with the value close to 0 little, for any correlation. Keeping the above truths in mind, the writer has discovered the following correlation analysis table generated using STATA 14.0 software packages.

Table 4.2 Correlation analysis matric of Variables covered under the study period.

```
. corr roe car nplr lptar bs
(obs=65)
```

	roe	car	nplr	lptar	bs
roe	1.0000				
car	-0.4449	1.0000			
nplr	-0.1571	-0.0725	1.0000		
lptar	0.4744	-0.0622	0.0295	1.0000	
bs	-0.4698	-0.2747	0.0740	-0.4766	1.0000

(Source: Author's computation of representative sample private commercial banks' data using STATA software packages)

The table 4.2 above depicts the association between predicted and predictor variables of the sampled commercial banks. Based on the results of the table, Capital adequacy Ratio (CAR) and Nonperforming loan Ratio (NPLR) come up with correlation values of -0.4449 and -0.1571

respectively. The negative sign of the correlation coefficients revealed that the movement of the variables was in the opposite direction to return on equity. This in other word implied that when the values of such variables increased the slope of financial performance measures tend to go downward and vice versa. However, the coefficient estimated values were, of course, lying between -1 through +1; they appeared low association with return on equity. The estimated correlation coefficient value of Loan provision to total asset (LPTAR) in the above table was 0.4744. The positive sign of the correlation coefficient showed that the movement of loan loss provision and the financial performance of sampled commercial banks were in the same direction implied that as the loan loss provision raised the slope of return on equity would also went upward during the study period. This relation was, however, low as the correlation coefficient value stood below half percent.

4.3 Classical Linear Regression Model (CLRM) Assumption Test

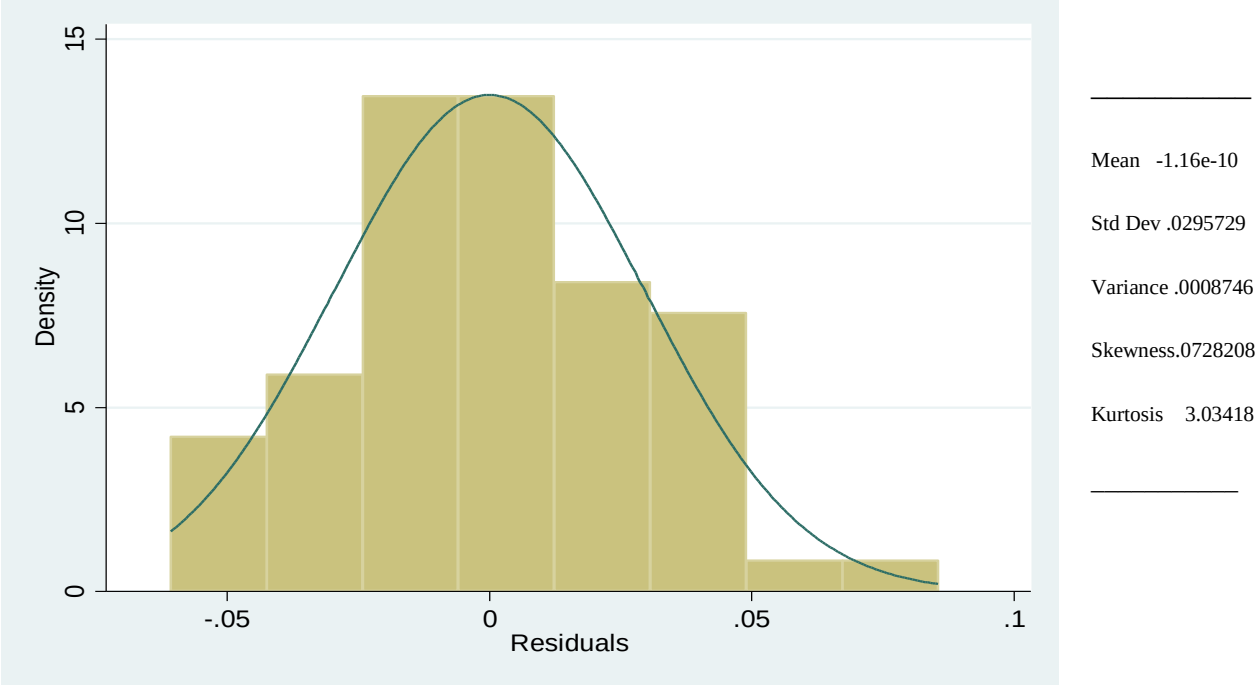
Linear regression model is statistical techniques that use several explanatory variables to predict the outcomes of the response variable. The objective of linear regression is to model the linear relationship between the explanatory and response variables. Accordingly, the variables of the study shall meet linear regression assumptions so that the regression result can provide reliable and satisfactory evidence about the model as a whole. Therefore, before employing the model to test significance and analyze the regression result of the dataset, researchers are advised to check linear regression assumptions including; normality, multicollinearity, hetroskedastesity tests so that misspecification can be identified.

4.3.1 Check for Normality

The normality assumption for multiple regressions is one of the most misunderstood in all of the statistics. In multiple regressions, the assumption requiring a normal distribution applies only to the residuals, not to the independent variables as is often believed. The residuals are the errors in the relationship between dependent and independent variables in regression model. The sample, in each case, has the residuals that represent the difference between explained and explanatory variables produced in regression equation. Therefore, normality assumption is the distribution of residuals in the sample that should be normally distributed. If the normality assumption is violated the hypothesis testing will not be reliable.

The normality assumption of any parametric regression can be examined using several statistics normality tests are such as Jarque-Bera and Histogram of residuals tests. In regression statistics, Jarque-Bera test is the goodness of fit test of whether the skewness and kurtosis of sample data have matched to normal distribution. This is the case that to say sample data residuals are normally distributed, it should have skewness zero and kurtosis 3 standard values. However, since the regression analysis is estimation skewness and kurtosis may not come up with the value exactly equal to the standard value but approximate to that are acceptable. In any regression analysis, the sample data are said to have normally distributed when skewness is symmetrical and have balanced tail in both sides left and right while kurtosis should not be too flat or too peaked otherwise sample data are not normally distributed.

Histogram test is the most obvious way to tell if distribution is normal or approximate to normal. Therefore, it is important to look at the histogram graph in that if the graph is bell shaped and symmetrical about the mean researchers can surely assume the distribution of sample data residual is normal. However, researchers may not get exactly bell-shaped or symmetrical, thus approximate shape to that can be considerable normal. The author of this investigation employed used two most commonly normality tests Jarque-Bera and Histogram of residuals tests and the results showed residuals are normally distributed.



(Source: Author's computation of representative sample private commercial banks' data using STATA software packages)

The above Jarque-Bera test results above showed that skewness was 0.0728208 and kurtosis was 3.03418 the values were not exactly to the standard but very close to the standard value and revealed that the distribution is normal. The above histogram normality test result was generated from sample commercial banks dataset using STATA 14.0 software packages. Although the two tails were not exactly balanced, the shape of probability density function of residuals approximately revealed that the distribution was symmetrical. Therefore, keeping deviations that does not over shadow the overall result, the residuals distribution of the sample dataset for private commercial banks were normal during the study period.

4.3.2 Hetroskedastesity Test

The ordinary least square assumes all the observations are equally reliable i.e. the error variance is constant. Hetroskedasticity, however, is a systematic pattern in errors where the variances of the errors are not constant in regression output. This may lead to inefficiency of ordinary least square estimators and some other linear estimators to have lower variance. Hetroskedasticity can be tested using two most commonly use tests; the Breusch-Pagan test and the White's test. The Breusch –Pagan Godfrey (BPG) test is used for linear forms of hetroskedasticity i.e.as the y^ goes up the error variance also go up. According to the Breusch –Pagan test, at 95% confidence interval the p-value should be greater than 5% to accept the null hypothesis of homoscedasticity.

The following would show the author's test for hetroskedasticity of private commercial banks' sample dataset under Breusch –Pagan Godfrey (BPG) test using STATA 14.0 estat hettest command:

Figure 4.3: Breusch –Pagan Godfrey (BPG) test for hetroskedasticity

```
. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of roe

         chi2(1)      =     1.79
         Prob > chi2  =   0.1811
```

As it had been said earlier, according to the Breusch –Pagan test, at 95% confidence interval the p-value should be greater than 5% significance level to accept the null hypothesis of homoscedasticity. In this case, the p-value was 0.1811 greater than 0.05 significance p-value at 95% confidence interval and the null hypothesis was not rejected. This, therefore, revealed that variances for sample dataset of the commercial banks' were constant i.e. no hetroskedasticity problem was discovered in Breusch –Pagan Godfrey test for hetroskedasticiy

4.3.3 Multicollinearity Test

In statistics, multicollinearity is a phenomenon in which one predictor variable in a multiple regression can be linearly predicted from the other with a substantial degree of accuracy. In this situation, the coefficient estimates of the multiple regressions may change erratically in response to small changes in the model or data. In a multivariate regression model with collinear predictors can indicate how well the entire bundle of predictors predict the outcome variable, but it may not give valid results about any individual predictors, or about which predictors are redundant with respect to others. Most commonly, the issue of multicollinearity in a multiple regression model occurs when there is approximate linear relationship among two or more independent variables of the study. For any multiple regression models, perfect multicolliearity is said to be occurred when the correlation between two independent variables is equal to 1 or -1. To sum up, the best regression models are those in which the predictor variables each correlate highly with the dependent (outcome) variable but correlate at most only minimally with each other.

The detection of multicolinearity can easily be undertaken using correlation matrix and the variance inflation factor.

Correlation Matrix uses STATA command *corr var1 var2 var3 var4* in detecting multicolliearity of the study variables.

Table 4.3: Correlation matrix of the dependent variables

Dependent Variables	CAR	NPLR	LPTAR
CAR	1.0000	-0.0725	-0.0622
NPLR	-0.0725	1.0000	0.0295
LPTAR	-0.0622	0.0295	1.0000

(Source: Researcher's computation using STATA software packages)

According to the table above, none of the independent variables correlate 80% and above but rather they correlate very minimally revealed that the model quality was maintained.

The other multicollinearity testing method the researcher had used was the variance inflation factor that measures how much the variance of an estimated regression coefficient increases if your predictors are correlated (multicollinear). It is the quick measure of how much a variable is contributing to standard errors in regression analysis. The variance inflation factor (VIF) equal to 1 indicates no relation; variance inflation factor (VIF) greater than 1 otherwise and when variance inflation factor (VIF) is greater than 10, then the regression coefficients are poorly estimated and imperfect muIticollinearity is likely.

The figure 4.6 below showed test of multicollinearity between the independent variables.

```
. estat vif

    Variable |       VIF       1/VIF
-------------+----------------------
          bs |      1.48    0.675428
       lptar |      1.37    0.729604
         car |      1.14    0.874982
        nplr |      1.01    0.987617
-------------+----------------------
    Mean VIF |      1.25
```

(Source: author's computation using STATA 14.0)

Some software instead calculates the tolerance which is just the reciprocal of the VIF.

Based on the results of the above table, the neither of the independent variables showed VIF equal to 1 but minimally correlated each other as the value was small and close it. However, since the VIF between the independent variables was not greater than 10, then the regression coefficients are not poorly estimated and imperfect muIticollinearity is likely.

4.4.3 Omitted Variables Test

In multiple regression models, omitted variable refers any variable that was not included as an independent variable in regression that might influence the dependent variable. The bias results in the model attributing the effect of the missing variables to those that were included.

The Gauss-Markov theorem states those regression models which fulfill the classical linear regression model assumptions provide the most efficient, linear and unbiased estimators. In ordinary least square (OLS), the relevant assumption of the classical linear regression model is that the error term is uncorrelated with the repressors.

The presence of omitted variable bias therefore violates this assumption and causes the estimator to be biased and inconsistent. The estimators and the covariance between the predictors and the omitted variables can determine the direction of the bias. Accordingly, positive (negative) bias indicates that given random sampling, on average estimates will be too large (small) and size of the bias is important, as a small bias may not be cause for concern.

Likewise, the direction of correlation between two independent variables can be guessed through theory. Generally, based on the results the test, rejection of the null hypothesis implies that there are possible missing variables and the model suffers from endogeneity, causing biased coefficient estimates. This study applied STAT command “estat ovtest” to perform the Ramsey regression specification error test (RESET) for omitted variables for sample private commercial banks and the test output was as follows.

Figure 4.7: Omitted variable test for sample representative private commercial private banks in Ethiopia.

```
. estat ovtest

Ramsey RESET test using powers of the fitted values of roe
       Ho:  model has no omitted variables
                  F(3, 57) =      2.03
                  Prob > F =      0.1199
```

(Source: author's computation of omitted variables using STATA 14.0software packages)

In this situation, Ramsey RESET test should produce values for the null hypothesis to be accepted. The probability value is one that plays vital role in decision rule as to whether to accept or reject the stated null hypothesis. Accordingly, the p-value should be insignificant at 95% confidence interval and 5% significance level. Therefore, the p-value was 0.1199 above significance level (5%), the Ramsey RESET test holds true and the model was free from specification error.

4.4.4 Regression Analysis

Regression analysis is a reliable method of identifying which variables have impact on the topic of interest. The process of performing regression allows the researcher to confidently determine which factors matter most, which factors can be ignored and how these factors influence each other. The most common form of regression analysis is the linear regression, in which one finds the line that most closely fits the data according to a specific mathematical criterion. As a result, in this section of the paper multiple linear regression analysis of the empirical study had been undertaken using STATA 14.0 version software and results were interpreted accordingly.

Therefore, the following was the regression result of the factors that most matters impact of credit risk on the performance of the sample representative private commercial banks in Ethiopia.

The figure 4.8: regression output

```
. reg roe car nplr lptar bs
```

Source	SS	df	MS	Number of obs	=	65
				F(4, 60)	=	25.29
Model	.094373576	4	.023593394	Prob > F	=	0.0000
Residual	.055971694	60	.000932862	R-squared	=	0.6277
				Adj R-squared	=	0.6029
Total	.15034527	64	.002349145	Root MSE	=	.03054

roe	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
car	-.515232	.0734825	-7.01	0.000	-.6622188	-.3682452
nplr	-.3025663	.1441677	-2.10	0.040	-.5909447	-.0141879
lptar	3.067844	1.484843	2.07	0.043	.0977155	6.037973
bs	-.0537921	.0097481	-5.52	0.000	-.0732912	-.0342929
_cons	.795586	.1073572	7.41	0.000	.5808398	1.010332

(Source: author's regression of sample representative private commercial banks data)

The multiple regression output in the above table showed that Return on Equity (ROE) was a taken as financial performance measure of the sample representative private commercial banks in Ethiopia while Capital Adequacy Ratio (CAR), Nonperforming loan to total loan ratio (NPLR), and loan provision to total asset ratio (LPTAR) were credit risk measures (predictors) that most matters the financial performance of commercial banks. In addition, Bank Size (logTA) was a control variable to the size of the banks hold constant during the study period. It is not the variable of interest in the study, but it could influence the outcome of the result. The R^2 shows how well the terms or data points fit a line while adjusted R^2 shows how well the terms fit the line but adjusts for a number of terms in the model. From the regression output, the R^2 value 0.6277 indicates the performance measure return on equity is predicted about 62.77% of the variation by credit risk measures (predictors) whereas the remaining 37.23% can be explained by the variables not included in the model. To sum up, the explanatory factors of financial performance of private commercial banks Ethiopia were good enough.

Based on STATA 14.0 software the regression output above, the results of Capital Adequacy Ratio (CAR), Nonperforming loan to total loan ratio (NPLR), and loan provision to total asset ratio (LPTAR) statistically significant in that their (p-value < 0.05) at 95% confidence interval implying that these factors most matter the financial performance of sample private commercial

banks in Ethiopia. Usually, the impact direction of the explanatory factors on the explained factor relies on the sign of estimated coefficients that explanatory factors come up with in regression analysis. Accordingly, the study revealed that Capital Adequacy Ratio (CAR), Nonperforming loan to total loan ratio (NPLR) factors were correlated negatively while loan provision to total asset ratio (LPTAR) was correlated positively to financial performance of commercial banks. Concerning to hypothesis, there is no evidence to accept their null hypothesis of the study for all factors.

4.4.5 Discussion of Regression Results

Capital Adequacy Ratio (CAR): Based on above regression output, Capital Adequacy Ratio (CAR), has a (p-value .000) which was very much less than the standard (p-value .05) implying that capital adequacy ratio (CAR) is statistically significant and there is enough evidence to provide that capital adequacy ratio has significant effect on the financial performance of private commercial banks in Ethiopia. In addition, capital adequacy ratio has statistical but negative correlation with bank performance implying that a one unit change in capital adequacy ratio will adversely affect bank profitability. This means when commercial banks keep 1 Birr as capital reserve, keeping bank size and all other explanatory factors constant, their profitability will be reduced by 0.5152 Birr. This is consistent with the findings of (Abera, 2018; Gizaw et al., 2015; Bhattarai, 2019) who found out the adverse relationship of capital adequacy with bank performance.

Nonperforming loan to total loan ratio (NPLR): The findings of the regression result revealed that nonperforming loan to total loan ratio (NPLR) has p-value 0.040 which is less than 0.05 at 5% significant level. As a result this factor is statistically significant and that there is sufficient evidence that nonperforming loan to total loan ratio (NPLR) has a significant effect on financial performance has been rejected.

However, the estimated negative coefficient of nonperforming loan to total loan ratio (NPLR) shows that there exists an inverse relationship with performance measure return on equity. This means that a unit change in nonperforming loan to total loan ratio has a potential to affect bank performance in opposite direction. Typically, a 1 Birr increase in nonperforming loan to total loan ratio will decrease banks profit by 0.3025 Birr holding bank size and all other predictor

variables constant. This finding is in line with the literatures (Mulugeta, & Seid, 2018; Bizuayehu, 2015) who found a negative significant relationship between nonperforming loan and financial performance of commercial banks.

The loan loss provision to total asset ratio (LPTAR) result in the above regression analysis shows p-value 0.043, there is good evidence loan loss provision has significant effect on the financial performance of private commercial banks in Ethiopia. Regarding to correlation, loan loss provision has statistical and positive significance relationship with return on equity. A change in one unit in the loan loss provision is expected to affect bank performance in the same direction. This means that, keeping bank size and all other predictor factors constant, a unit increase in loan loss provision can result in 3.067 Birr increase on bank profitability. The fact here is that, banks provide loan loss provision in advance to cover expected future loss and the more banks' loan loss provision out of the total asset, the less risk of loan loss and the more profitability would likely be, but it is controversial that as loan loss provision increase yielding asset amount and profitability will decline. This finding is consistent with the findings of (Belay, 2019; Gizaw et al., 2015) who found a positive significant relationship between loan loss provision and bank profitability.

The coefficient of control variable bank size is not interesting to interpret as the researcher included it only to keep restricted the variation in the performance measure to estimate the association of the interest. That is to say, the study includes control variable in the study, even if it is not the variable in the topic of interest, to hold constant banks economies and diseconomies of scales that could influence the outcome and prevent the researcher from drawing wrong conclusion and recommendation.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This study has investigated the impact of credit risk on the financial performance of commercial banks Ethiopian by employing factors that most matters the return on equity. Descriptive analysis, correlations, and multiple linear regressions analysis were undertaken and the results of these analyses were clearly discussed in the aforementioned chapter. In this section of the paper, conclusions and recommendations the findings were discussed accordingly.

5.1 Summary of the findings

The core purpose of this study was to examine the relationship between credit risk and bank profitability of commercial banks in Ethiopia based on the panel data analysis. To accomplish the intended objective previous related literatures were reviewed; secondary data from the sampled seven private commercial banks under the study period (2011-2020) were collected and analyzed using descriptive and regression analysis. In addition, based on the nature of the data quantitative research approach, explanatory research design, random sampling technique were employed and most relevant variables to the model fitness were included in the study. Similarly, for the purpose of discussing effects of explanatory factors (including capital adequacy ratio, nonperforming loan ratio, and loan loss provision ratio) on the explained factor (return on equity) and providing a convincing conclusion and recommendations, study data were analyzed using STATA 14.0 version software packages.

Therefore, the findings of this investigation displaying the causal relationship between return on equity and credit risk measures helps to provide result conclusions and recommendations as follows:

5.2 Conclusions

According to the regression output above, the result of capital adequacy ratio, nonperforming loan ratio, showed that these factors had negative statistical significant on bank profitability. Conversely, another credit risk measure loan loss provision ratio had positive statistical significance on private commercial bank’s financial performance.

The findings of the regression output revealed that capital adequacy ratio had negative statistical significant effect on bank performance of private commercial banks in Ethiopia.

Like that of the capital adequacy ratio, nonperforming loan, which matches to the researcher's theoretical expectation, has a statistical negative impact on the bank's profitability. This proves the fact that as the nonperforming loan ratio is being reduced to the lower level, the profit level of private commercial banks will be improvised.

On the other side, loan loss provision has a positive statistical significant influence on bank performance measure return on equity implying that when banks keep more funds as provision to doubtful debt, credit risk on loan default will be decreased leading to a considerable increase in profitability.

With regard to bank size -control variable, sample banks in the study were selected based on random sampling technique that includes banks having large product and high risk diversification may incur lower risk and earn good profitability whereas banks with few product and low risk diversification are expected to make low return. For this reason, the researcher has used bank size as a control variable to hold bank's economies and diseconomies of scales constant.

Indeed, credit risk affects bank profitability to the greatest extent provided that credit risk measures significantly associate with bank performance as shown on the findings of the investigation. Moreover, it can conclude that the model is good enough to explain variation credit risk measures against bank performance.

5.3 Recommendations

Previous literatures on the same topic of interest revealed that the issue credit risk is an inherent and a serious problem with which commercial banks are seen keep and face the problem around the globe. However, the degree of seriousness may differ among countries in that well developed countries have abstract and strong credit risk management practice relative to under developed countries as a result its impact on bank profitability is not the same. Therefore, Ethiopian commercial banks in general and private commercial banks in particular should develop and implement sound credit risk administration strategies, policies, procedures and practices so that

the effect and threat of credit risk on bank financial performance will be reduced to the minimum. Consequently, adequate and healthy bank profitability will exist in the future enabling them to better withstand any financial shocks against their operation.

Furthermore, as it was concluded that there exists negative relationship between defaulted loan and bank performance measured by return on equity, thus it is recommended that bank managers need to put their effort to better control nonperforming loans and minimize its impact on profitability.

Similarly, the investigation discovered that capital adequacy ratio has significant adverse effect on financial performance of commercial bank in Ethiopia. This implies that it is not always best for commercial banks to hold capital reserve and thus commercial banks are recommended to invest in a more income generating areas like quality loan to boost profitability and maintain their stability.

In contrast, it was concluded that loan loss provision ratio worth positive significant effect on performance, which seems to contradict the higher loan loss provision the lower will be bank earning asset and profitability. However, banks can be beneficial as if they keep large loan loss provision; therefore, it is better for private commercial banks to hold loan loss provision so that they can protect themselves against bad loans and promote profitability. Typically, it is important for bank managers, shareholders' and other practitioners to continue their focus on it to ensure robustness of commercial banks operation.

To sum up, since significant relationship between credit risk and bank performance is revealed in the finding, the policy implication is that private commercial banks are recommend develop strict credit administration policy, evidenced by significant result, to attain optimal profitability.

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