ST.MARY'S UNIVERSITY

SCHOOL OF GRADUATE STUDIES

THE EFFECT OF CREDIT RISK MANAGEMENT ON PROFITABILITY OF ETHIOPIAN COMMERCIAL BANKS

BY

CHERAMLAK MARE

ID NO: SGS/0229/2013A

May, 2022

ADDIS ABABA, ETHIOPIA

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A THESIS SUBMITTED TO ST. MARY'S UNIVERSITY, SCHOOL OF GRADUATE STUDIES IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE MASTERS DEGREE IN ACCOUNTING AND FINANCE

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APPROVED BY BOARD OF EXAMINERS

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External Examiner   Signature

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Internal Examiner   Signature

DECLARATION

I, the undersigned, declare that this thesis is my original work, prepared under the guidance of Meseret Milargeh (PHD). All sources of materials used for the thesis have been duly acknowledged. I further confirm that the thesis has not been submitted either in part or in full to any other higher learning institution for the purpose of earning any degree.

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Name   Signature
St. Mary's University, Addis Ababa   May , 2022

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ACKNOWLEGEMENTS

Firstly, it is with great appreciation and gratitude towards my advisor Dr. Meseret Milargeh , for his helpful guidance, valuable support, critical comment for each part of the paper, timely feedback and in general for his professional support in this study. So I want to thank you so much.

Second, I would like to thank the staffs and managements of all the private commercial Banks who have participated in the study for their response to research questionnaire and interview and specially the national bank of Ethiopia and their staff for providing me with sufficient and timely data for the study.

Third, I would like to acknowledge the support of friends and colleagues for their different support through the process of the study.

Last but not least, I thank you my family for their different support and encouragement through this study

Most of all I would like to be grateful to my almighty GOD for giving me health and strength to Continue and finish this study.

ABBREVIATIONS/ACRONYMS

Abay	Abay Bank
AB	Awash Bank
ADiB	Addis international bank
BuiB	Bunna international Bank
BeIB	Birhan int. Bank
BOA	Bank of Abyssinia
BOD	Board of Director
CBE	Commercial Bank Ethiopia
CBO	Cooperative bank of Oromiya
CRM	Corporate Risk Management
CSG	Credit Suisse Group
CAR	Capital adequacy ratio
DGB	Debub Global bank
DB	Dashen Bank
DBE	Development Bank of Ethiopia
DRC	Director Risk and Compliance
EB	Enat Bank
ERM	Enterprise Risk Management
FDRE	Federal Democratic Republic of Ethiopia
NBE	National Bank of Ethiopia
NIB	Nib international Bank
LLPTL	Loan loss provision to term loan ratio
LIB	Lion international Bank
OIB	Oromiya int. bank
PASAI	Pacific Association of Supreme Audit Institutions
RC	Risk Committee
ROA	Return on asset
ROE	Return on equity
TLTD	Term loan to total deposit ratio
TLTA	Term loan to total asset ratio

UB	United Bank
WB	Weggagen Bank
ZB	Zemen Bank

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ABSTRACT

The purpose of this paper is to examine the effect of credit risk management on profitability of commercial banks of Ethiopia as measure by variables including loan loss provision to term loan ratio, capital adequacy ratio, ban size, total loans to total deposit ratio and total loans to total asset ratio for measuring the risk level of the bank while return on asset and return on equity are taken as proxies for profitability of the banks. The study undertakes ten years' time series data for seventeen commercial banks which are currently under operation and analyze the data using SPSS version 25 software to identify the cause and effect of each variable described above. The findings of this study suggest that improving credit management, increases efficiency of asset management, and eventually increase commercial banks' profitability in Ethiopian baking business. Therefore improvement in credit risk factors such as NPLs position, capital adequacy ratio has significant and positive effect on profitability of banks. Hence bank management and the regulatory body should make the necessary arrangement to regulate the banks NPLs and CAR position for the industry to be profitable.

Chapter one

1. Introduction

1.1 Background of the study

Risk is one of the fundamental and important elements of the banking business and therefore the business of banking can be taken as the business of risk management without which the whole process of the banking business might be compromised. However taking risk will have and should have its own limits. As taking excessive risk entails performance inefficiency that would result lower profitability and doing nothing in the expectation of risk occurrence would also lead to lower profitability. Therefore the balance of risk taking and doing the banking function is an important aspect of the banking sector.

Given that as it is, banks face a lot different types of risks which mainly can be classified as credit risk, liquidity risk and interest rate risk. However it should be noted that there are a long list of risk types that can be faced by banks such as operational risk, foreign exchange risk, market risk and settlement and performance risk etc.

Of all this type of risks, credit risks and its management plays one of the central roles in bank profitability and sustainability and attaining the right balance in the banking function.

Credit risk can be defined as the risk that a counter party or (usually a borrower) fails to comply with to a contractual agreement on a financial transaction and on its obligations to service its debts and(or)that the counter party will deteriorate in its financial and credit standing.

It is well known that banks are intermediary units between savers and borrowers and hence facilitate the business of transferring economic empowerment from one entity or individual to another however in doing so the banks face various kinds of risks as mentioned earlier.

Banks encounter risks of different types and intensity even though they provide their services in at most prudence and in the most possible ways of securitization and even always supported by government laws regulations. One of the reasons that the banks may face such risks is because that they run for swift delivery of their products so as to satisfy the needs of their customers in the light of tough competition among other causative agents.

Credit risk can be caused by various reasons while its main effect is default of the customer in repaying its loan. Some of the reason for default cans business failure, marketability problems, management change or management inability, technological changes, economic breakdown and depression, financial crisis, political problems, willful default etc. Generally any situation that would deteriorate production and marketability might result in default on loans and hence would pose credit risk.

Credit function is one of the major revenue generating apparatus of banks and hence becomes the major source of risk in the bank's profitability position. Therefore the need for credit risk management becomes important aspect of banks profit making capacity; in addition to this, the repetitive incidents of financial crisis in recent years which have macroeconomic causes all over the world and the subsequent need for the formulation of new Basel regulations make the credit risk management function an important function of the banks management and thereby its study an important subject.

Given that the major function of banks is lending activity it can be taken that banks are actors of risk managers in as mush they are financial intermediaries. Throughout history banks has been known to work with corporations and other entities by offering a variety of risk management products such as options, swaps and other aspects of financial management in a multi-currency scenarios.

Generally credit risk can be defined as identification, measurement, monitoring and control of risk which arises from the incident of default of loan repayments (Early, 1996; Coyle, 2000).

Therefore the effectiveness of credit risk management depends on the capacity of the banks to process information and identify risk elements and to make that information up to date in process so as to keep the balance between risk and profit.

The purpose of this research is therefore to identify the effect of credit risk management on the profitability Ethiopian commercial banks

The study also tries to identify the formation of reliable data base so as to curb loan defaults and creation of sufficient liquidity position at all the time to satisfaction of the customer needs and hence to maximization of its shareholders gain.

Various studies undertaken in other African, European countries show an empirical relation of credit risk management and bank performance by their ROA and ROE, the two most common indicators of profitability in their different models.

1.2. Background History Banks in Ethiopia

As per various literatures banking was started in Ethiopia in 1905 E.C with the establishment of Abyssinian Bank. The bank was established through a fifty year agreement with the Anglo-Egyptian National Bank. Then after a development bank and two foreign banks were established in 1908 (Degefe, 1995 cited in Geda, 2006). Then in the year 1931 the Ethiopian government purchased the Bank and renamed it as the Bank of Ethiopia.

As stated in Degefe (1995) banking activity of the country has relatively been expanded during the five-years of Italian occupation and it is noted that most of the banks operating at that time was the Italian banks. After independence, the English bank known as Barclays Bank has been established and it remained in operation through the period of 1941 to 1943.

Then in 1943 the state bank Ethiopia was established even though the Britain's were against it which has made the establishment processes a noted painful process. Nevertheless this bank has operated both as commercial and central bank until 1963 then in 1963 the bank was remodeled and took a new name and becomes National Bank of Ethiopia (NBE). But again it is re-established in 1976 and named as Commercial Bank of Ethiopia (CBE).After this time many other new banks are established and have remained in operation up to the 1974 revolution. Then gain all the privately owned financial institutions, including three commercial banks, thirteen insurance companies, and two non-bank financial intermediaries were nationalized on 1 January 1975. Then the nationalized banks were reorganized and becomes four commercial banks and one insurance company taking names as commercial bank Ethiopia (CBE), a national bank, two specialized banks, the Agricultural and Industrial Bank, renamed after a time as the Development Bank of Ethiopia (DBE) and a Housing and Saving Bank, renamed lately renamed as the Construction and Business Bank (CBB), and one insurance company (the Ethiopian Insurance Company) were formed (Degefe 1995 cited in Geda 2006).

After the fall of the Dergue regime in 1991 and introduction of liberalization policy in 1992, the financial institutions were reorganized along with market based policy framework. In additions, other private financial institutions were also allowed to operate alongside the publicly owned institutions. As a result, the number of banks operating in the country reached 18 of which 16 are private, and the remaining's state-owned (NBE, 2016/17).

As stated earlier currently there are 16 private and two government owned banks are in operation. Out of the two commercial bank one acts as commercial bank while the other development bank as policy bank. While all the banks are controlled by the national bank of Ethiopia. It is noted that under current market price the banks control more than a billion birr asset. In addition currently there are more than a dozen banks in establishment phase and about four of them has commenced operation in the current year.

1.3 Statement of the problem

The thorough understanding of the causes of credit risk is the major step in mitigating and managing the risks that might occur due to bad debts and subsequently identifying its effect on the profitability of the bank.

As the nature of the banking business requires it most of the asset of the banks in allocated on loans and advances. Usually over 85% of banks asset is found in the loans and advances that they deliver to their customers. (Saunders, Cornett, 2005).

Identification of credit risk variables is an important step for devising its management & should be developed by the banks so that they will have a well-organized method of mitigating the occurrence of credit risk.

As per Seppala et. al (2001) and Flannery and Ragan (2002) having a sound credit policy would contribute for better understanding of asset quality and thereby help for the establishment minimum standards. It will also help to have a common knowhow regarding the loopholes that would create credit risk exposure. Moreover the understating will help to proactively understand the loopholes and acquire knowledge on the degree of probable risk level.

As per literatures a credit policy should set forth the bank's lending philosophy and clearly indicate and stipulate the specific procedures and means of monitoring the lending activity (Polizatto, 1990; Popiel, 1990).

Various methods have been known in the practice for integrating different risk elements into the decision-making process of the lending activity. Such methods might range from use of subjective or informal approaches to very complex approaches such as the use of mathematical models (Montes-Negret, 1998; CBK Annual Supervision Report, 2000). According to Saunders (1996), banks need to gather sufficient information about potential customers so as to adjust their credit risk exposure. The information resulted will guide the bank in assessing the probability of borrower default and price the loan accordingly. It is assumed that much of this information is

expected to be collected through the loan documentation phase. The bank should also go beyond the information provided by the borrower and seek additional information from third parties like credit rating agencies if available and credit reference bureaus as NBE credit reference bureau of Ethiopia. (Simson and Hempel, 1999).

As described earlier in the introduction part , the goal of having credit risk management is to attain the a maximum risk adjusted rate of return by pinpointing credit risks integrated within every level of banking transactions and at large in the asset portfolios of the banks and hence bringing the credit risk exposure to an acceptable level. Thus bringing effective credit risk management system is a vital importance for any banking organization (Basel 1999a)

Various researchers have undertaken studies to identify the effect of credit risk management on the profitability of Ethiopian commercial banks. Some these researchers are Tibebu (2011), Girma (2011) and Solomon (2013), Zemedkun H.(2019) their studies mainly focused on credit risk management in relation to profitability of the commercial Banks and assessing the impacts of credit risk management on performance of banks. But didn't incldue all the major banks and also didn't take sufficient variables.

Hence the current research paper tries to fill the gap regarded with the effect of credit risk management on the profitability of Ethiopian commercial banks specifically in identification of credit risk elements such as non-performing loans, capital adequacy ratio , total asset , total loans and advances in relation to deposit and loans with respect to total asset and also showing the extent and intensity of each variable in the profit making capacity of the banking industry by using empirical evidence. In doing so the tries to answer the means to have effective CRM with regard to profitability, create better understanding with regard to the cause and effect relation of the variables considered by adding up to date data for better conclusion.

Previous researches assessed focus on the qualitative relation of credit risk management on profitability of the bank while my study will focus on the empirical data and the relation between the risk causing variable which are included in this study on increasing or reducing profitability of the banking business and hence will cover the gap observed in this regard.

Hence to do so the study poses the following research questions and hypothesizes as shown below.

1.4 Hypothesis of the study

$H0_1$: Credit risk proxied by LLPTL has no effect on profitability proxied by ROE

$H0_2$: Credit risk proxied by CAR has no effect on profitability proxied by ROE

$H0_3$: Credit risk proxied by TA there has no effect on profitability proxied by ROE

$H0_4$: Credit risk proxied by TLTD has no effect on profitability proxied by ROE

$H0_5$: Credit risk proxied by TLTD has no effect on profitability proxied by ROE

$H0_6$: Credit risk proxied by LLPTL has no effect on profitability proxied by ROA

$H0_7$: Credit risk proxied by CAR has no effect on profitability proxied by ROA

$H0_8$: Credit risk proxied by TA there has no effect on profitability proxied by ROA

$H0_9$: Credit risk proxied by TLTD has no effect on profitability proxied by ROA

$H0_{10}$: Credit risk proxied by TLTD has no effect on profitability proxied by ROA

1.5 Research questions

The study intends to answer several key questions to assess credit risk management at Ethiopian commercial banks which will include the following major research questions and hypothesis.

1. How is the relation between credit risk and profitability in commercial banks of Ethiopia?
2. What are the variables that affect profitability of Ethiopian commercial banks?
3. How much does credit risk affects profitability of commercial banks?
4. Can there be any policy implications for reducing risk and increasing profitability?
5. What is the effect of bank specific variables included in the study i.e LLPTL, CAR, LNTA, TLTD, TLTA on Profitability of on commercial banks of Ethiopia as measured by measured by (ROA)?
6. What is the effect of bank specific variables included in the study i.e LLPTL, CAR, LNTA, TLTD, TLTA on Profitability of on commercial banks of Ethiopia as measured by measured by (ROE)?

1.6 Objective of the study

1.6.1 General objective

The main purpose of this study is to assess the effectiveness of Credit Risk Management on Loan Performance and Profitability in Ethiopian commercial bank.

1.6.2 Specific objectives

Specifically, the study seeks to address the following issues from the general objective:

To assess the relationship between profitability proxied by ROA & ROE and credit risk proxied LLPTL in Ethiopian commercial banks.

1. *To identify the relationship between profitability proxied by ROA and credit risk proxied LLPTL in Ethiopian commercial banks.*
2. *To assess the relationship between profitability proxied by ROA and credit risk proxied CAR in Ethiopian commercial banks.*
3. *To evaluate the relationship between profitability proxied by ROA and credit risk proxied TA in Ethiopian commercial banks.*
4. *To measure the relationship between profitability proxied by ROA and credit risk proxied TLTD in Ethiopian commercial banks.*
5. *To evaluate the relationship between profitability proxied by ROA and credit risk proxied TLTA in Ethiopian commercial banks.*
6. *To assess the relationship between profitability proxied by ROE and credit risk proxied LLPTL in Ethiopian commercial banks.*
7. *To measure the relationship between profitability proxied by ROE and credit risk proxied CAR in Ethiopian commercial banks.*
8. *To assess the relationship between profitability proxied by ROE and credit risk proxied LnTA in Ethiopian commercial banks.*
9. *To evaluate the relationship between profitability proxied by ROE and credit risk proxied TLTD in Ethiopian commercial banks.*
10. *To determine the relationship between profitability proxied by ROE and credit risk proxied TLTA in Ethiopian commercial banks.*

1.7 Significance of the study

The study on credit risk management will contribute to existing knowledge and literature on the subject under study. Furthermore, the study will also assist as a reference material to other

researchers. in addition the research is assumed to give head light for giving emphasis on formulating credit risk management strategy to mitigate credit related risks through an empirical evidence

It is assumed that the research will give headlight for producing workable credit risk management policy by identifying existing loopholes within the already established CRM procedure and day to day practice of the bank.

1.8 Delimitation /Scope of the study

The scopes of the study restricted to address the objective of the paper, i.e identifying effectiveness of credit risk management in Ethiopian commercial Bank in relation to profitability. The paper does not state the causes of risk but only dwell the impact of risk on profitability and only assess the impact of having effective CRM on identifying and curbing credit risks.

1.9 Definition of terms

Credit Risk: means the possibility of losing the outstanding loan partially or totally, due to credit events (default risk)(BCBS, 2001).

Loan and advances: means any financial asset of a bank arising from a commitment to advance fund by a bank to a person that is conditioned on the obligation of the person to replay the funds, either on a specified date or dates or on demand, usually with interest (NBE, 2008).

Credit risk management: means the process of risk identification, measurement, monitoring and control (NBE, 2010) and identifying those variables including loan loss provision, capital adequacy ratio ,natural logarithm of banks total asset as a measure of bank size , total loan to total deposit ratio , total loan to total asset ratios.

Non-performing loan (NPL): means loans as loans left unpaid for a period of 90 days (Basel 2001). Or under NBE definition non-performing loans are defined as "loans or advances whose credit quality has deteriorated such that full collection of principal and/or interest in accordance with the contractual repayment terms of the loan or advances are in question; or when principal and/ or interest is due and uncollected for 90 (ninety) consecutive days or more beyond the scheduled payment date or maturity (NBE Directive, SSB/43/008).

Loan loss provision to total loans and advances (LLPTL): means the provision allotted in expectation of the non-performing loans

Capital adequacy ratio (CAR): means the provision allotted in expectation of the non-performing loans

Bank size as ln of total asset (LnTA): means the provision allotted in expectation of the non-performing loans

Total loans and advances to total deposit (TLTD): means the provision allotted in expectation of the non-performing loans

Total loans and advances to total asset (TLTA): means the provision allotted in expectation of the non-performing loans

1.10 Organization of the paper

The report study is organized in five chapters; the first chapter is an introductory part of the study which introduces the overall study. This part contains back ground of the study, Back ground of the company under study, statement of the problem, significance of the study, research questions, and objective of the study, definition of terms, limitation and organization of the study.

The second chapter deals with literature review, which review of scholar's work in the research topic, both theoretical and empirical literature, is presented.

The third chapter, research methodology, approach and design, it is emphasized on the design of the study and methodology used. In these chapter research design and data, techniques, source of data and data collection tools, data collection procedure and data analyzing methods are discussed.

The fourth chapter is devoted on data presentation, analysis and interpretation in which the collected data are analyzed and organized in a meaningful manner so as to meet the objectives of the study.

The last chapter is mainly concerned with conclusion and recommendations. Here conclusions are presented and recommendations will be point out for the findings of the study.

Chapter Two

2. Literature review

2.1 Types of risk

Generally speaking, there are two main classes of risk: systematic and unsystematic.

- ❖ Systematic risk is the risk created due to the market uncertainty it represents external factors that impact all (or many) companies in an industry or group.
- ❖ Unsystematic risk represents the asset-specific uncertainties that can affect the performance of an investment.

Below is a list of the most important types of risk that impacts financial companies.

- ❖ Political/Regulatory Risk – The impact of political decisions and changes in regulation
- ❖ Financial Risk – The capital structure of a company (degree of financial leverage or debt burden)
- ❖ Interest Rate Risk – The impact of changing interest rates
- ❖ Country Risk – Uncertainties that are specific to a country
- ❖ Social Risk – The impact of changes in social norms, movements, and unrest
- ❖ Environmental Risk – Uncertainty about environmental liabilities or the impact of changes in the environment
- ❖ Operational Risk – Uncertainty about a company's operations, including its supply chain and the delivery of its products or services
- ❖ Management Risk – The impact that the decisions of a management team have on a company
- ❖ Legal Risk – Uncertainty related to lawsuits or the freedom to operate
- ❖ Competition risk – The degree of competition in an industry and the impact choices of competitors will have on a company
- ❖ **Credit risk – the impact of default on loan repayment**

  Risk can also be defined as financial risk or uncertainty of financial loss. Some literatures classify risk in three major types these are Credit Risk, Market Risk & Operational Risk. Furthermore risk is the potentiality that both the expected and unexpected events may have an adverse impact on the bank's capital or earnings. The expected loss is to be borne by the borrower and hence is taken care of by adequately pricing the products through risk premium and reserves created out of the earnings. It is the amount expected to be lost due to changes in credit quality resulting in default. Whereas, the unexpected loss on account of the individual

exposure and the whole portfolio in entirely is to be borne by the bank itself and hence is to be taken care of by the capital. Thus, the expected losses are covered by reserves/provisions and the unexpected losses require capital allocation. Hence the need for sufficient Capital Adequacy Ratio is felt. Each type of risks is measured to determine both the expected and unexpected losses using VaR (Value at Risk) or worst-case type analytical model."

2.2 Risk management strategy

A risk management strategy is the strategy developed to curb and produce a line of defense in a proactive way on the future occurrence of risk.

Risk management strategy would be developed after identifying risks and assessing the likelihood of occurrence, as well as the impact they could have. The whole assessment process with this regard and production of the proper options can be regarded as risk management strategy.

There are four main risk management strategies, or risk treatment options these are:-

- ☞ Risk acceptance
- ☞ Risk transference
- ☞ Risk avoidance
- ☞ Risk reduction

In order to undertake on a given strategy type the impact of the risk and its occurrence probability need to be assessed and qualitative as well as quantitative data should be collected for embarking an action towards the strategy.

Generally risk management strategy implies the adoption of a planned and systematic approach to the identification, assessment and prioritization of risks to minimize, monitor and control the probability and/or impact of unfortunate events (threats) and maximize the realization of opportunities by using the resources of the financial institution.

Banks and financial institutions usually establish three line of defense to protect its assets.

The first line of defense is the business units at each branch and at head office level. The second line is risk and compliance management department and the third of defense is internal audit. One of the major functions of the second line of defense i.e the risk and compliance department are to ensure the bank's business decisions are in line with its overall strategic objectives; to ensure the company's overall activities are consistent with its risk appetite; to provide an effective risk management framework in order to conduct its banking activities in a consistent

and controllable manner; promote efficient allocation of capital; perform due diligence prior to the introduction of new products and services; Timely identifying compliance risk and take corrective actions before the risks are materialized into operational losses;

In order to attain the aforementioned objectives, the Department's Key activities include but not limited:

- ❖ Perform identification, assessment and monitoring of the companies risks;
- ❖ Prepare and submit periodical risk exposure reports to the Board, Executive Management and other concerned organs as deemed necessary;
- ❖ Develop risk management policy and procedure or guideline for various risk types;
- ❖ Review and forward feedback and comments(if any) on policies, procedures and all other processes of the Bank;
- ❖ Advise the Board, Executive Management & others on pertinent risk management issues;
- ❖ Advice or recommend strategies to mitigate/control relevant risks;
- ❖ Conduct awareness creation regarding the risk management process;
- ❖ Proactively identify all applicable national and international laws and regulations and ensure stakeholders understanding as well as commitment towards them and the Bank's compliance accordingly;
- ❖ Provide advice to all stakeholders on applicable laws, rules and standards, including keeping them informed on developments in the area; and ensure that strategic decision are made in conformity with them;
- ❖ Identify, assess and monitor compliance risk;
- ❖ Perform compliance monitoring and testing;
- ❖ Prepare periodic compliance reports to the Board of Directors, Executive Management and other units;
- ❖ Liaise with external bodies on compliance matters; and
- ❖ Perform other related duties and activities as deemed necessary

2.3 Types of risk on financial industry specially banks

Banks are exposed to various kinds' risks while pursuing their business undertakings. The basic ones include:-

- **Credit Risk -** Credit risk is the potential that a borrower will either be unwilling or unable to perform on an obligation in accordance with agreed terms. It arises any time bank funds are extended, committed, invested, or otherwise exposed.

- **Operational Risk -** Operational risk is the risk of loss resulting from inadequate or failed internal processes, people and system or from external events. Operational risk is associated with human error, system failures and inadequate procedures and controls. It is the risk of loss arising from the potential that inadequate information system; technology failures, breaches in internal controls, fraud, unforeseen catastrophes, or other operational problems may result in unexpected losses or reputational problems.

- **Liquidity Risk -** Liquidity risk is the potential for loss to an institution arising from either its inability to meet obligations as they fall due or to fund increases in assets without incurring unacceptable cost or losses (funding liquidity risk).

- **Market Risk - (a), Interest Rate Risk -** Interest Rate Risk is the exposure of a bank's financial condition (earnings and capital) due to adverse movements in interest rates.

  (b), Foreign Exchange Rate Risk - Foreign exchange rate risk is the risk that the value of on - or off -balance sheet positions/instruments will be adversely affected by movements in exchange rates.

  Apart from the above risk types, Banks can also assess their exposure to the following risk types:

- **Strategic Risk -** Strategic risk refers to the current or prospective risk to earning and capital arising from adverse business decisions, poor implementation of those decisions, or lack of responsiveness to changes in the industry or operating environment.

- **Reputational Risk -** Reputational risk is the potential that negative publicity regarding an institution's business practices, whether true or not, will cause a decline in the customer base, costly litigation, or revenue reductions.

- **Legal Risk -** Legal risk is the risk that a financial institution will conduct activities or carry out transactions in which they are inadequately covered or are left exposed to potential litigation.

- **Information Technology Risk -** Technology risks relate to any adverse outcome, damage, loss, disruption, violation, irregularity or failure arising from the use of or reliance on

computer hardware, software, electronic devices, and online networks and telecommunications systems.

❖ **Project Risk** - Project risk is an uncertain event or condition that, if it occurs, has a positive or negative effect on one or more project objectives such as scope, schedule, cost, and quality.

And our interest of study is credit risk.

2.4 What is credit risk?

As mentioned earlier credit risk is defined as the potential that a borrower will either be unwilling or unable to perform on an obligation in accordance with agreed terms. It arises any time when the banks funds are extended, committed, invested, or otherwise exposed.

In another literature Credit risk can also be defined as the potential failure of counterparty to meet its contractual obligations. This standard should be applied to all activities posing a credit risk to the supervised entity. It describes that loans are the largest source of credit risk, but credit risk (counterparty risk) may also be inherent in other types of assets, such as bonds, short-term debt securities and derivatives, and in off balance-sheet commitments, such as unused credit lines or limits, guarantees and documentary credit.

2.5 Ways of credit risk management

Credit management procedures involve risk identification and measurement mechanisms.

Identifying the external and internal factors that influence events is useful to effective credit risk identification. The Bank's credit risk identification methodology may comprise a combination of techniques together with supporting tools and looks at both the past and the future.

Some techniques for identifying credit risk are:

❖ Monthly reports received from different functional units of the bank

❖ Different local and/or international media reports;

❖ Industry/technical conferences;

❖ Benchmarking reports;

❖ loan review reports;

❖ NBE/EBA/peer websites; and

❖ Industry, trade and professional journals.

Credit Risk Measurement and Analysis

The credit risk measurement analysis invokes undertakings such as portfolio analysis, asset quality review, ratio analysis, related party transaction revolving credit facility, single borrower limit, and measurement of concentration risk, internal risk ratings, stress testing and risk scoring.

Portfolio Analysis and Asset Quality Review

Portfolio analysis & asset quality review vis-à-vis the respective limits to measure the level of credit concentration risk involving economic sector; geographic region; types of products; maturity period; single borrower; Off Balance sheet exposure; NPLs; ODs; Revolving Credit Facilities; and Related and unrelated party transactions.

Ratio analysis

Various ratio analyses will be conducted to determine the credit risk in the portfolio. These ratios include:

Non-Performing Loans (NPLs) ratio

Non-performing loans and advances are loans and advances (L&A) categorized under substandard, doubtful and loss. (For further understanding please refer to NBE's Directive No. SBB/69/2018 of asset classification and provisioning). It is calculated as:

$$\frac{\text{Total outstanding balance of NPLs}}{\text{Total outstanding balance of L\&A}}$$

"Total provision to NPLs" ratio

Provisions are meant to absorb potential losses in the loans and advances. It is calculated as:

$$\frac{\text{Total provision for NPLs}}{\text{Total NPLs balance}}$$

The following table shows the percentage of provision to be held for each classification category

Table 1: Loan status classification

Classification category	Minimum provision (A)	Outstanding balance under (B)	Provision Amount (C)
Pass	1%	Pass Category	C=(A X B)
Special Mention	3%	Special Mention Category	C=(A X B)

Substandard	20%	Substandard Category	C =(B − (B X Average Recovery Rate)) x A
Doubtful	50%	Doubtful Category	C =(B − (B X Average Recovery Rate)) x A
Loss	100%	Loss Category	C =(B − (B X Average Recovery Rate)) x A

Measuring Concentration Risk

Concentration risk arises when the Bank invests most or all of its assets to a single or few individuals, entities, sectors or products. That is, whenever the Bank fails to diversify its loan and investment portfolios, concentration risk will emerge on its credit portfolio.

The Bank's credit concentration risk can be measured by Herfindahl Hirschman Index (HHI). This tool is a widely used indicator of concentration risk which is defined as the sum of the square of the relative portfolio shares of all group elements. For the purpose of credit concentration risk, group elements refer to sectors, products, regions, top borrowers, etc. It is measured as:

$$HHI = \sum_{i=1}^{n} S_i^2$$

Where, S_i= Share (%) of each element across the total portfolio.

An HHI value close to Zero represents a well-diversified portfolios with a very large number of small borrowers. Meanwhile, heavily concentrated portfolios may have a considerably higher HHI value whereby in the extreme case the HHI takes the value of 1.

Measurement scales (Decision rules):
- HHI≤0.010 indicates homogeneous concentration risk.

- 0.100>HHI>0.010 indicates satisfactory concentration risk.

- 0.180>HHI>0.100 indicates moderate concentration risk.

- HHI>0.180 indicates high concentration risk.

k (or a group of entities) of a specific event and /or movement in a set of financial variables.

It is expected that each bank performs stress tests for its internal needs in order to identify reaction of sectors to extreme events; assess the sensitivity of credit factors and approaches to extreme events in order to ensure appropriateness; identify "hidden" correlations within portfolio; support portfolio allocations decisions and strategy beyond normal current conditions; evaluate potential capital requirements under possible future credit environments; and identify benchmarks to create some awareness of the current market situation.

Stress testing is the process of determining the effect of a change to a portfolio or sub-portfolio due to extreme (exceptional) and realistic (plausible) events.

Types of credit stress tests sensitivity analyses; Scenario analyses; Historical scenarios; Hypothetical scenarios; Event-driven; Portfolio-driven; Macroeconomic events; Market events; and Worst case/catastrophe events.

For measuring the impact of credit risk on profitability banks use value at risk; variance covariance approach ; Monte Carlo simulation methods and cash flow at risk methodologies.

Which method is best?

With three methods from which to choose, the obvious question is: which method of calculating value at risk is best? Unfortunately, there is no easy answer. The methods differ in their ability to capture the risks of options and option-like instruments, ease of implementation, ease of explanation to senior management, flexibility in analyzing the effect of changes in the assumptions, and reliability of the results. The best choice will be determined by which dimensions the risk manager finds most important.

In my research credit risk management is mainly assessed non-performing loans. (NPLs) As stated by Abdelkader (2009) NPLs is a significant indicator that explains bank profitability performance. The existence of high NPL position indicates the banks' exposure for large default risk. Studies conducted by Kwambai & Wandera (2013) on Kenya banks for the period 2007-2012 on the existence of high NPLs shows the banks incapacity to protect themselves from default risk.

In another study the NPLs position can be affected by both internal and external factors.

Some of these factors could be credit terms, bank size, economic condition in the macro level etc. In addition fast loan growth will impact banks in making them to be exposed for large loan losses.

Since the incidence of submarine mortgage crisis in 2007 capital based regulations such as Basel I & II becomes significant mechanism to analyze default risks. The Basel accords put a minimum capital based requirement i.e. CAR which puts an 8 percentage points to measure financial soundness of banks and determine their capacity to absorb shocks and identify their risk appetite capacity according to Fatima(2014). Hence CAR is also another variable that I use in my study to show credit risk exposure.

As noted in another study made in Kenyan banks by Mathuva (2009) profitability of banks in Kenya are affected by their CAR. Similar conclusions were reached in the study made in Nigeria as conducted by Olalekan for the period 2006 to 2010. In this particular study it is shown that CAR having an important role in determining profitability of the banks. Further CAR is affected by leverage negatively while NPLs position and ROA has positive impacts or relation on CAR. (Abdioglu (2011) and Avusharba et al (2013).

In my research ratio analysis is used to measure profitability. Various researchers have shown that ratio analysis of ROA and ROE as a good indicator of bank performance with regard to profitability.

ROA is calculated as a percentage of net income and total assets; it states the level of net income generated by the bank and determines how the bank has used its assets to generate profits over the years. ROE is a percentage of net income over shareholder's equity, it is the most commonly used method to determine the effectiveness of bank revenue generation according to various elements of shareholder equity. As shown by Saeed (2016) ROA& ROE have large impact on commercial banks profitability as studied in big UK banks and these variables as the dependent variables and main indicators of the bank's profitability and NPLs positions (provisions for loan losses) as independent variables.

In additions bank size leverage positions along with growth of banks have effect on profitability of banks. Hence these variables are also considered in these studies.

Another study conducted by Li and Zou(2014) made on 47 commercial banks found in Europe undertaken CAR and NPLs as an independent variable while ROA and ROE as a dependent variable to show the effect of credit risk management i.e. NPLs and CAR as proxies of credit risk management and ROA and ROE as proxies of profitability measuring tools. Hence in my study I used ROA and ROE as dependent variable and NPLs and CAR as independent variable.

Chapter Three

3. Research Methodology

3.1 Research Approach

A descriptive research would be used as the study requires some analysis on the efficient management of bank's credit risk and its management affect banks profitability. After collecting the relevant data, I will conduct both statistical analysis and financial analysis to arrive on some sort of information and conclusion.

It is also assumed that secondary will be utilized to collect the relevant data. The secondary source of information is assumed to be official website, Annual report, operation manual of Credit Risk Management and annual report of Basic bank, national bank data base as major source as well as related different other websites, books etc. .

3.2 Research design

The study will be conducted based the research question forwarded and based on previously existed theories and studies in this area.

The method of our study is assumed to be quantitative descriptive type. The study employed multiple linear regression models using SPSS version 25 to analyze the data collected from the annual reports of the banks. Based on the data collected from the banks the study conducted & analyzed and attempted to answer the research questions. The analysis results are described through a descriptive approach.

3.3 Data Collection

The data source for our study is time series data taken annual reports for 10 years for all the commercial banks currently operating in Ethiopia i.e. from year 2011 to year 2020 in G.C.

3.4 Data analyzing instruments

I expect to use regression analysis in the study: the relation of one dependent variable to multiple independent variables. The regression outputs are assumed to be obtained by using SPSS. In addition, I will apply MS Excel to undertake various analyses.

3.5 Model specification

It is revealed from early studies that the determinant for profitability is ROE (Net Income/Total Shareholders' Equity) and for credit risk management are LLPTL (loan loss provision /Total Loans) and CAR [(Tier I + Tier II)/Risk Weighted Assets] respectively.

The study uses two multiple linear regression models with five independent variables to measure the relationship between profitability and credit risk management in Ethiopian banks as follows.

In the regression model, I have considered the following:

Model 1: A model that predicts the impact of CRM on profitability of Ethiopian commercial banks as follows:

$Y= \alpha+\beta_1 X_1+ \beta_2 X_2+\ldots+ \beta_n X_n+ \varepsilon$

Standard our application

Y – The value of dependent variable; Y: ROE- profitability indicator

α – the constant term;

β – The coefficient of the function;

X – The value of independent variables:

X_1: NPLR –credit risk management indicator

X_2: CAR –credit risk management indicator

ε – The disturbance or error term.

Thus the regression equation becomes:

$ROE= \alpha+ \beta_1 LLPTL+ \beta_2 CAR+ \beta_3 \ln TA+ \beta_4 TLTD+ \beta_5 TLTA+ \varepsilon$

It is the regression function which determines the relation of X (LLPTL, CAR, LNTA, TLTD, TLTA) to Y (ROE). α is the constant term and β is the coefficient of the function, it is the value for the regression equation to predict the variances in dependent variable from the independent

variables. This means that if β coefficient is negative, the predictor or independent variable affects dependent variable negatively: one unit increase in independent variable will decrease the dependent variable by the coefficient amount. In the same way, if the β coefficient is positive, the dependent variable increases by the coefficient amount. α is the constant value which dependent variable predicted to have when independent variables equal to zero (if X1, X2=0 then α=Y). Finally, ε is the disturbance or error term, which expresses the effect of all other variables except for the independent variables on the dependent variable that we use in the function.

The Probability value (P-value) is used to measure how reliably the independent variables can predict the dependent variable. It is compared to the significance level which is typically 0,05. If the P-value is greater than 0,05, it can be said that the independent variable does not show a statistically significant relationship with the dependent variable.

 Model 2:

ROA= α+β1LLPTL+ β2CAR+ β3ln TA+ β4TLTD+ β5TLTA+ ε

It is the regression function which determines the relation of X (NPLR and CAR) to Y (ROE). α is the constant term and β is the coefficient of the function, it is the value for the regression equation to predict the variances in dependent variable from the independent variables. This means that if β coefficient is negative, the predictor or independent variable affects dependent variable negatively: one unit increase in independent variable will decrease the dependent variable by the coefficient amount. In the same way, if the β coefficient is positive, the dependent variable increases by the coefficient amount. α is the constant value which dependent variable predicted to have when independent variables equal to zero (if X1, X2=0 then α=Y). Finally, ε is the disturbance or error term, which expresses the effect of all other variables except for the independent variables on the dependent variable that we use in the function.

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Dependent variable

I have decided to use ROE as the indicator of the profitability in the regression analysis because ROE along with ROA has been widely used in earlier research.

Independent variables

Five independent variables are chosen namely LLPTL , CAR , LnTL , TLTD , TLTA as the main credit risk indicators and bank size (ln of TA) , TLTD (ratio of total term loan to total deposit) and TLTA (ratio of total loan to total asset) as additional variables that indicate risk management which affect the profitability of banks. LLPTL, in particular, indicates how banks manage their credit risk because it defines the proportion of NPL amount in relation to TL amount. LLPTL is defined as Loan loss provision divided by TLs. To calculate this ratio, the study use the data provided in the annual reports of the bank as mentioned earlier.

LLPTL = (Loan loss provision amount) ÷ (TL amount)

CAR. CAR is regulatory capital requirement (Tier 1 + Tier 2) as the percentage of RWAs. I will choose CAR as an independent variable and justify the choice in the literature review.

Bank size = Ln of toal asset (TA)

TLTD= Outstanding of loans and advances(TL) ÷ total deposit (TD)

TLTA= Outstanding of loans and advances (TL)÷ total asset (TD)

Chapter Four

4. Data analysis & Interpretation

4.1 Descriptive analysis

4.1.1. Market share of the each commercial banks in Ethiopia at the current time

As stated earlier currently there are 16 private and two government owned banks are in operation. Out of the two commercial bank one acts as commercial bank while the other development bank as policy bank. While all the banks are controlled by the national bank of Ethiopia. It is noted that under current market price the banks control more than a billion birr asset. In addition currently there are more than a dozen banks in establishment phase and about four of them has commenced operation in the current year.

The following table shows the market share with regard to asset, loans and advance, deposit and capital of the banks which are currently under operation.

Table 2: Commercial banks of Ethiopia and their respective market share

Commercial Banking sector
Market share
As of June, 2019
Amount (In millions of Birr)

	Asset		Total loan and advances		Deposit		Capital	
Banks	Amount	Share(%)	Amount	Share(%)	Amount	Share(%)	Amount	Share(%)
CBE	573,894.2		179,487.96	46.07	451,857.6		47,205.7	
AIB	74,635.40	7.31	406.99	0.10	59,616.06	7.35	7,005.12	6.87
DB	56,218.41	5.51	32,576.38	8.36	44,721.51	5.51	6,846.78	6.72
BOA	39,294.43	3.85	23,735.00	6.09	32,146.45	3.96	4,950.40	4.86
WB	29,770.01	2.92	16,451.31	4.22	23,545.28	2.90	4,293.62	4.21
UB	35,736.10	3.50	21,723.41	5.58	29,079.85	3.59	3,859.59	3.79
NIB	33,717.42	3.30	19,440.35	4.99	27,663.71	3.41	4,411.04	4.33
LIB	20,391.56	2.00	11,852.58	3.04	16,396.67	2.02	2,559.45	2.51
CBO	41,790.80	4.09	22,159.17	5.69	36,168.28	4.46	3,289.56	3.23
ZB	14,689.02	1.44	7,777.76	2.00	11,625.17	1.43	2,332.62	2.29
OIB	31,779.31	3.11	17,486.83	4.49	26,589.12	3.28	3,712.59	3.64
BuIB	14,494.78	1.42	8,281.21	2.13	10,586.66	1.31	2,568.85	2.52
BrB	19,172.56	1.88	10,215.77	2.62	14,964.28	1.84	2,795.97	2.74
AB	15,106.30	1.48	7,711.49	1.98	11,598.38	1.43	2,457.46	2.41
AdIB	5,514.85	0.54	2,677.41	0.69	3,946.56	0.49	1,111.64	1.09

DGB	5,487.51	0.54	2,451.67	0.63	3,523.44	0.43	994.25	0.98
EB	9,201.55	0.90	5,132.92	1.32	7,118.28	0.88	1,535.15	1.51
Public	573,894.2	56.21	179,487.96	46.07	451,857.6	55.71	47,205.7	46.31
Private	447,000.0	43.79	210,080.25	53.93	359,289.6	44.29	54,724.0	53.69
Total Sector	1,020,894.29	100.00	389,568.20	100.00	811,147.30	100.00	101,929.80	100.00

As shown above he banking sector assets was over a billion birr as of 2019 and amounted to 3% of the GDP contribution of the country

This section presents descriptive analysis shows the variability and statistical values with regard to the various elements that are regarded with profitability and credit risk measuring proxies summarized for the studied period.

Table 3: Summary of statistical values for each of the variables considered in the study

	Obs	Mean	SD	Maximum	Minimum
ROA	162	2.7679	1.295217	6.7172	(7.5068)
ROE	162	20.9915	12.26747	77.7086	(25.2434)
CAR	162	0.3302	2.370046	30.3067	0.0372
LLPTL	162	0.3388	1.522509	15.8951	0.0000
LnTA	162	15.9160	1.569149	20.3848	7.3539
TLTD	162	0.6195	0.097665	0.9146	0.3972
TLTA	162	0.4673	0.081876	0.6547	0.2636

The above presents descriptive statistics of the variables. The table shows the two profitability indicating (i.e. the proxies for profitability) ratios which are return on assets & return on equity, and five credit risk indicators which are CAR , LLPTL, TLTA, and TLTD ratios, and LnTA (bank size computed by the natural logarithm of total assets as a proxy for size). The descriptive statistics indicate ROA is not positive in all the banks which indicate that some banks sustain loss during the period under study. The same effect is observed in ROE. Further observation of the banks data shows that some banks have sustained loss during the initial periods of their operations.

4.2 The trend of each variable over the years

The following tables and graphs shows the trend for ROE , ROA , CAR, LLPTL , TLTD and TLTA for all the banks under study in the period 2011 to 2020.

4.2.1 The trend of ROE over the years

Table 4 : ROE of each bank over the years

YR	ENAT	DGB	ADiB	Abay	ZB	BuiB	BrIB	LIB	OIB	NIB	WB	UB	BOA	CBO	DB	AB	CBE
2011	-	-	9.0020	(3.3740)	40.9389	9.6993	16.8213	14.7125	17.5047	23.6144	27.0634	30.1293	29.0357	21.7430	35.7698	32.0773	48.4572
2012	-	-	14.0446	11.4530	42.4303	10.7208	17.4148	18.9788	13.4977	21.2136	22.8627	29.7402	27.6028	30.7727	40.4439	27.0290	77.7086
2013	17.9203	(25.2434)	16.5250	12.7712	33.1370	13.9797	12.0050	22.6516	13.5851	18.7464	19.9919	24.4877	26.2892	33.9392	31.3295	24.2227	69.3235

2014	14.3379	12.5309	15.3082	14.5790	24.3252	17.9464	9.6185	16.5129	23.7433	16.3827	16.0235	20.0381	20.5346	38.4201	30.6885	27.2453	67.9054
2015	14.2561	8.5838	15.2399	21.4797	31.9777	22.5212	16.1868	20.7699	25.4709	16.2773	15.4630	17.2508	17.4721	24.9823	26.4106	22.9829	71.8467
2016	11.9729	19.1082	13.2354	17.5380	21.5726	22.8769	29.7459	20.7355	13.4315	16.6034	14.3911	18.0389	18.3264	2.9661	23.1482	21.5400	60.3974
2017	15.1620	13.6502	13.5998	15.3600	22.9573	17.4039	22.4078	21.3168	19.3316	16.2062	17.2737	16.6395	22.6799	15.1806	20.5721	23.6695	32.5574
2018	14.8144	19.3014	15.8115	20.3815	21.5312	18.8985	16.0444	23.9899	34.1878	16.2556	22.0975	20.9760	15.7423	22.5657	18.8437	31.3120	11.6965
2019	12.5087	25.1413	17.2694	23.5439	17.7007	20.2699	18.3258	24.6793	23.6632	18.5012	15.2944	22.0832	16.8991	23.2214	15.9955	41.0897	23.5742
2020			-	18.0731	23.7124	15.6294	17.7838	21.2932	20.7068	20.4675	17.6941	19.3973	16.0645	28.1561	20.2767	32.4170	-

CHART 1 : ROE of each bank over the years

Chart Title
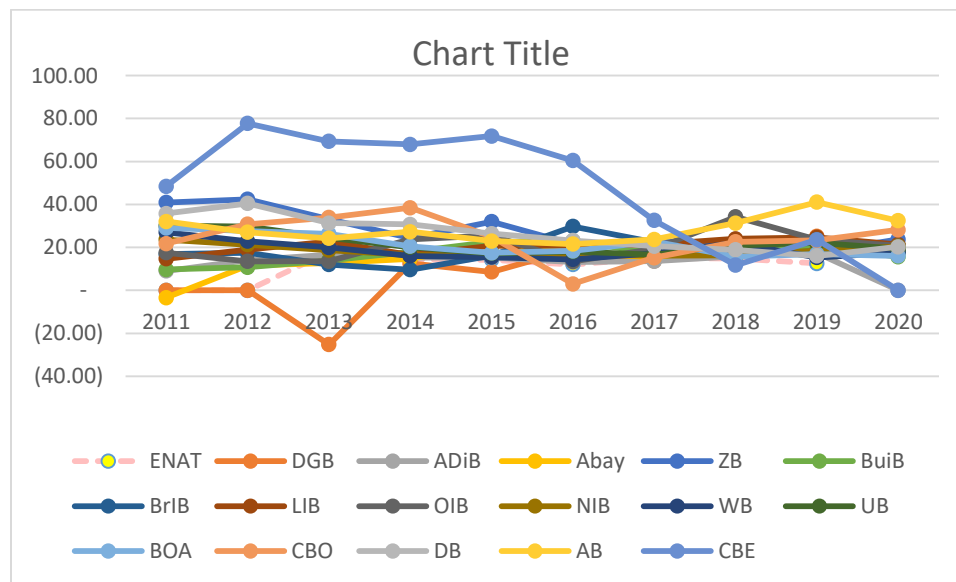
As shown in the above chart ROE has declined for CBE for the period under study while DGB has experienced a worst ROE in the year 2013. Otherwise the ROE for most of the banks has been constant over the years.

4.2.2 The trend of ROA over the studied years

Table 5 : ROA of each bank over the years

| YR	ENAT	DGB	ADIB	ABAY	ZEMEN	BUIB	BRIB	LIB	OIB	NIB	WB	UB	BOA	COOP	DB	AB	CBE
2011	-		3.4427	(1.1638)	6.7172	3.0882	3.2815	2.7587	2.8868	3.7675	4.6842	3.4038	2.6690	2.2148	3.3366	3.9936	3.0384
2012	-		4.0579	2.8506	6.3477	2.5949	3.0578	3.5310	2.0852	3.7204	4.0985	3.6077	2.7880	3.3062	4.0523	3.5771	3.9800
2013	3.6653	(7.5068)	4.0989	2.4119	4.3104	2.6463	2.1294	4.1221	1.9982	3.4370	3.6638	3.0039	2.8779	3.7011	3.2564	3.1311	3.3119
2014	2.9040	2.9407	3.9098	2.2377	3.3370	3.1109	1.7967	2.9464	3.0582	2.9899	2.9051	2.5447	2.5257	4.9419	3.4164	3.4231	3.1347
2015	2.9025	1.7025	3.9458	3.2254	5.1269	3.5812	2.9689	3.1791	2.8277	2.8086	2.7928	2.1444	2.3392	3.3216	3.1209	2.9401	3.1938
2016	2.3296	4.2447	3.1396	2.7303	3.4839	3.3119	4.6759	2.8065	1.4909	2.6802	2.5124	2.1436	2.3647	0.3524	2.7261	2.7815	2.4188
2017	2.8044	3.0317	2.9591	2.3409	3.3109	2.4202	3.7318	2.8118	2.0916	2.4065	2.8658	1.9489	2.7059	1.4629	2.3927	2.8033	2.1916
2018	2.5711	4.0061	3.2730	3.0164	2.9266	2.7605	2.6701	3.0896	3.6304	2.1583	3.2832	2.2976	1.9641	1.8450	2.3209	3.0695	1.0087
2019	2.0473	4.8173	3.5504	3.6571	2.4462	3.3535	2.7553	3.1059	2.6841	2.3864	2.1727	2.3596	2.1802	1.8353	2.0007	3.7562	1.7854
2020	-	-	-	2.8389	3.5600	2.6429	2.7299	2.4652	2.6232	2.7399	2.4488	2.2698	1.7750	2.5088	2.4697	3.1698	
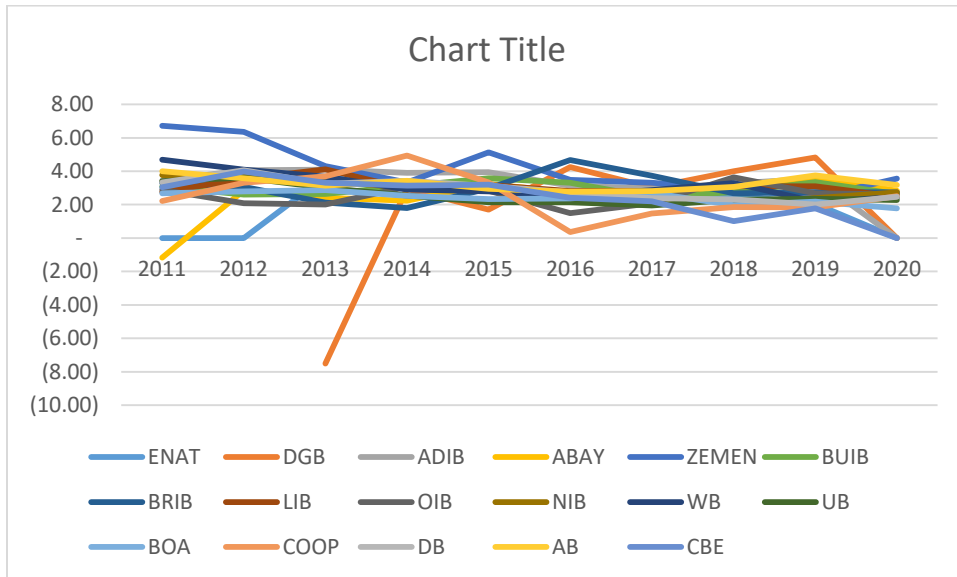
CHART 2 : ROA of each bank over the years

As shown in the above chart ROA has has been at a lower position for DGB in the year 2013 just like ROE in the same year.

4.2.3 The trend of LLPTL over the years

Table 6 : LLPTL of each bank over the years

|	ENAT	DGB	ADIB	ABAY	ZEMEN	BUIB	BRIB	LIB	OIB	NIB	WB	UB	BOA	COOP	DB	AB	CBE
2011	-		0.0102	0.0000	0.0156	0.0175	0.0112	0.0054	0.0106	0.0412	0.0454	0.0277	0.0333	0.0200	0.0199	0.0364	0.0245
2012	-		0.0100	0.0000	0.0178	0.0112	0.0117	0.0061	0.0129	0.0271	0.0243	0.0233	0.0257	0.0144	0.0215	0.0270	0.0221
2013	-	0.0091	0.0110	0.0126	0.0179	0.0116	0.0152	0.0058	0.0146	0.0250	0.0224	0.0186	0.0199	0.0172	0.0225	0.0230	0.0268
2014	-	0.0139	0.0119	0.0122	0.0852	0.0121	0.0163	0.0058	0.0131	0.0210	0.0167	0.0144	0.0179	0.0184	0.0185	0.0227	0.0269
2015	-	0.0118	0.0126	0.0125	0.0883	0.0115	0.0139	0.0081	0.0127	0.0150	0.0158	0.0122	0.0151	0.0256	0.0168	0.0174	0.0265
2016	0.0027	0.0134	0.0124	0.0144	0.0553	0.0170	0.0148	0.0106	0.0176	0.0177	0.0163	0.0130	0.0135	0.0527	0.0171	0.0153	0.0393
2017	0.0063	0.0170	0.0090	0.0113	0.0441	0.0167	0.0144	0.0103	0.0186	0.0163	0.0137	0.0124	0.0126	0.0322	0.0202	0.0146	0.0438
2018	0.0062	0.0172	0.0108	0.0174	0.0456	0.0145	0.0173	0.0131	0.0079	0.0150	0.0175	0.0130	0.0117	0.0235	0.0098	0.0082	0.0362
2019	0.0077	0.0206	0.0091	0.0148	0.0323	0.0159	0.0179	0.0113	0.0156	0.0098	0.0216	0.0051	0.0132	0.0341	0.0065	0.0086	0.0425
2020	0.0118	-	-	0.0119	0.0216	0.0177	0.0159	0.0150	0.0133	0.0084	0.0196	0.0068	0.0121	0.0280	0.0022	0.0174	
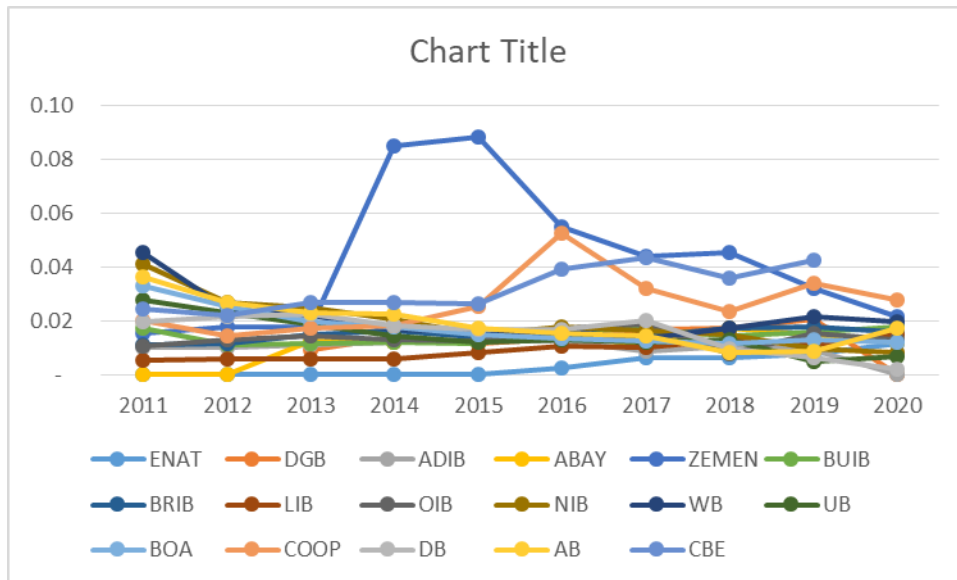
CHART 3 : LLPTL of each bank over the years

As shown in the above chart CBE has shown high LLPTL ratio (a good proxy for NPL position) in the year 2013 to 2015 while it has declined in the subsequent years. While this value is usually constant and similar for the other banks for the period under study.

4.2.4 The trend of CAR over the years

Table 7 : CAR of each bank over the years

	ENAT	DGB	ADIB	ABAY	ZB	BUIB	BRIB	LIB	OIB	NIB	WB	UB	BOA	COOP	DB	AB	CBE
2011			0.3824	0.3449	0.1502	0.2975	0.1641	0.1952	0.1509	0.1646	0.1659	0.1167	0.0908	0.0983	0.0953	0.1293	0.0548
2012			0.2456	0.2135	0.1491	0.2103	0.1838	0.1793	0.1570	0.1846	0.1922	0.1254	0.1100	0.1137	0.1043	0.1349	0.0486
2013		0.2974	0.2498	0.1732	0.1172	0.1759	0.1736	0.1842	0.1400	0.1822	0.1761	0.1203	0.1090	0.1065	0.1036	0.1251	0.0471
2014	0.2045	0.2074	0.2595	0.1414	0.1519	0.1716	0.1970	0.1738	0.1217	0.1828	0.1860	0.1326	0.1356	0.1483	0.1183	0.1261	0.0454
2015	0.2013	0.1914	0.2585	0.1563	0.1673	0.1506	0.1742	0.1403	0.1041	0.1642	0.1761	0.1174	0.1325	0.1231	0.1181	0.1295	0.0437
2016	0.2052	0.2493	0.2219	0.1553	0.1568	0.1409	0.1473	0.1318	0.1168	0.1591	0.1733	0.1200	0.1262	0.1142	0.1175	0.1289	0.0372
2017	0.1875	0.2050	0.2141	0.1504	0.1359	0.1378	0.1797	0.1320	0.1022	0.1405	0.1602	0.1149	0.1147	0.0856	0.1153	0.1111	0.0909
2018	0.1831	0.2092	0.2016	0.1463	0.1360	0.1523	0.1565	0.1263	0.1089	0.1267	0.1397	0.1054	0.1327	0.0795	0.1291	0.0881	0.0823
2019	0.1668	0.1812	0.2090	0.1627	0.1399	0.1772	0.1458	0.1255	0.1168	0.1308	0.1442	0.1080	0.1260	0.0787	0.1218	0.0939	0.0705
2020	0.1611			0.1529	0.1588	0.1629	0.1604	0.1095	0.1359	0.1363	0.1338	0.1245	0.0998	0.0974	0.1218	0.1011	

Chart Title

Legend: ENAT, DGB, ADIB, ABAY, ZEMEN, BUIB, BRIB, LIB, OIB, NIB, WB, UB, BOA, COOP, DB, AB, CBE
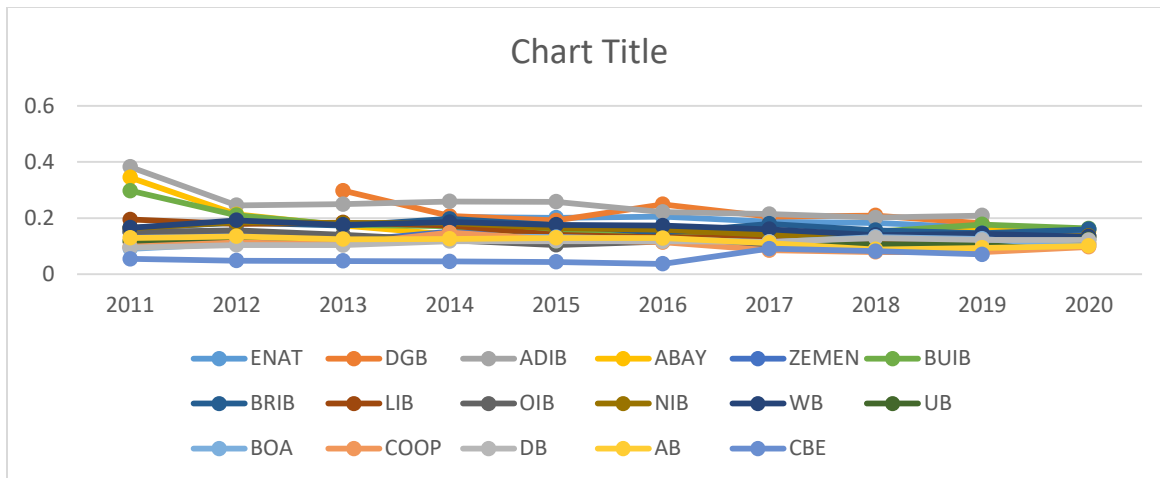
CHART 4 : CAR of each bank over the years

In the chart above it is indicated that CBE started from a modest CAR while other banks have started from almost a similar position. At the end of the studied period almost all banks show almost a similar amount of capital adequacy ratio.

4.2.5 The trend of total asset (TA) over the years

Table 8 : Ln TA of each bank over the years

|	ENAT	DGB	ADIB	ABAY	ZEMEN	BUIB	BRIB	LIB	OIB	NIB	WB	UB	BOA	COOP	DB	AB	CBE
2011			12.9591	13.0322	13.8696	13.5688	13.7253	14.4078	14.4894	15.7773	15.9025	15.8600	15.8003	14.7319	16.5006	16.1296	18.5540
2012			13.7280	14.0289	14.2939	14.1267	14.0663	14.7169	14.8406	15.9288	15.9374	15.9888	15.9245	15.1158	16.6789	16.2951	18.8832
2013		12.8494	14.0488	14.4839	14.6886	14.5706	14.6027	14.8947	15.1794	16.0287	16.1567	16.1167	16.1340	15.6931	16.7985	16.5931	19.0908
2014	14.1643	13.6818	14.3549	14.9777	14.9937	14.9181	14.8502	15.1001	15.6322	16.1902	16.2604	16.2901	16.2382	15.8103	16.9048	16.8127	19.3132
2015	14.6083	13.9497	14.7166	15.3377	15.1828	15.3195	15.2439	15.5836	16.0705	16.4000	16.4337	16.4800	16.4305	16.2545	17.0249	16.9881	19.5361
2016	14.9936	14.0717	15.0436	15.6379	15.3995	15.7355	15.7891	15.9097	16.2387	16.5774	16.5999	16.6645	16.6386	16.1846	17.1681	17.2036	19.7652
2017	15.3941	14.5396	15.2544	15.9780	15.8134	16.0999	16.1658	16.2112	16.6062	16.8610	16.8576	16.9021	17.0473	16.6904	17.3601	17.5526	20.0101
2018	15.6846	14.9974	15.5230	16.3271	16.0845	16.3821	16.4594	16.4771	16.9851	17.0998	17.1257	17.1488	17.2807	17.2130	17.6316	17.8277	20.1680
2019	16.0349	15.5180	15.6858	16.5306	16.3404	16.4893	16.7690	16.8306	17.2743	17.3335	17.2090	17.3917	17.4866	17.5482	17.8448	18.1281	20.3848
2020	16.2284			16.8214	16.5026	16.7529	16.8768	17.2744	17.3369	17.5642	17.4573	17.5767	17.8566	17.7761	18.0389	18.3074	
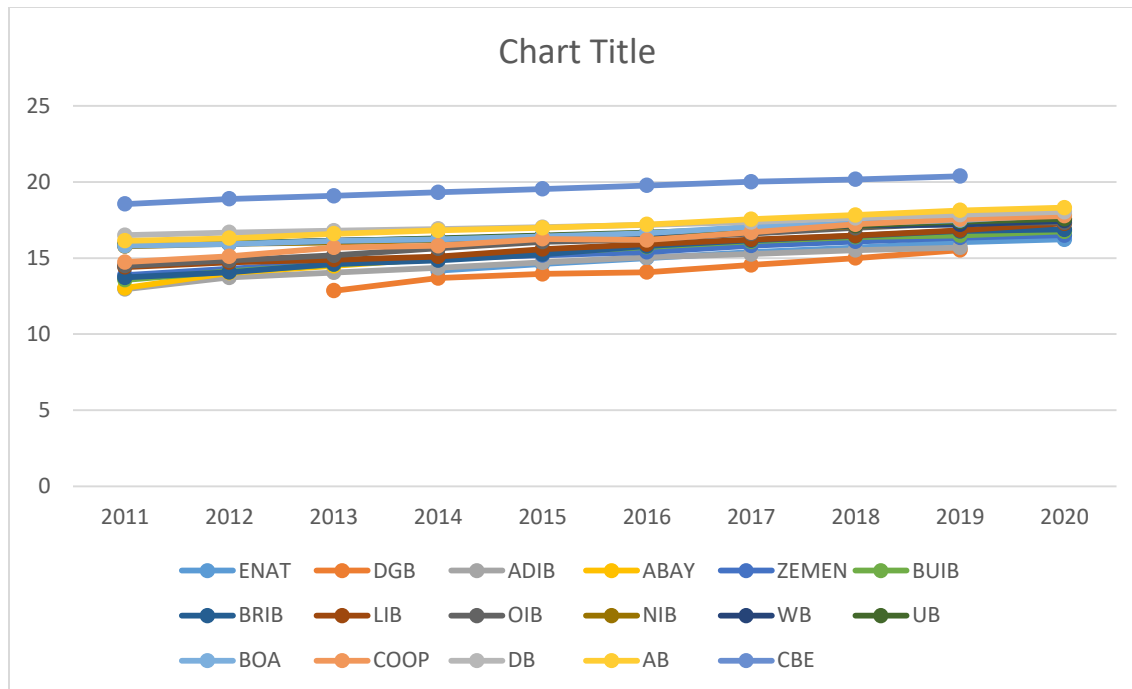
CHART 5 : LNTA of each bank over the years

As shown above the asset position of all banks has shown a constant and increasing from the starting period till the last period included in study.
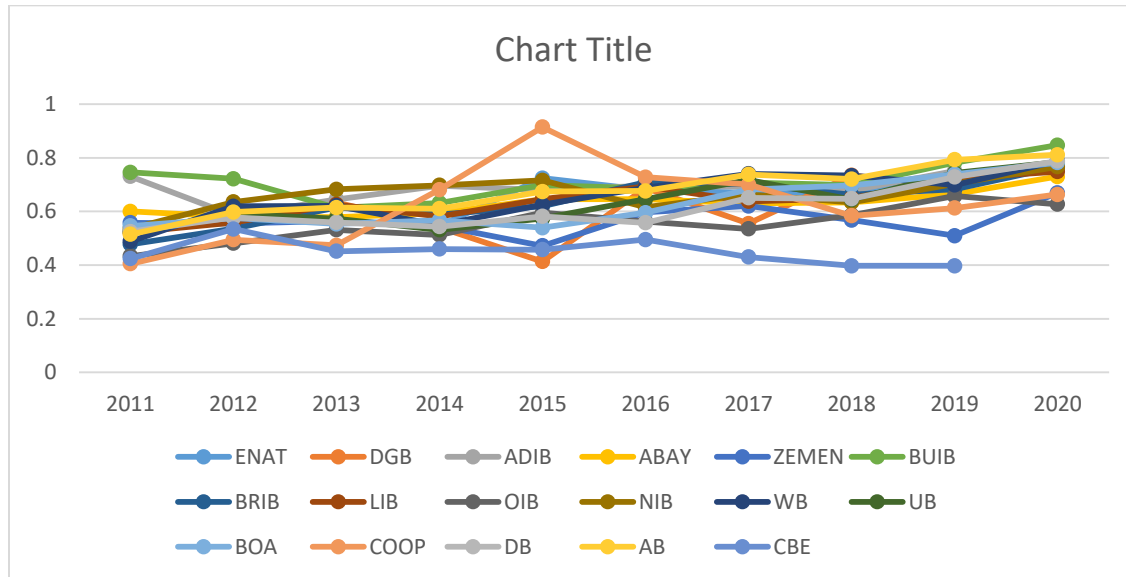
4.2.6 The trend of TLTD over the years

Table 9 : TLTD of each bank over the years

	ENAT	DGB	ADIB	ABAY	ZEMEN	BUIB	BRIB	LIB	OIB	NIB	WB	UB	BOA	COOP	DB	AB	CBE
2011			0.7308	0.5999	0.5580	0.7455	0.4779	0.5213	0.4336	0.5364	0.4885	0.5253	0.5458	0.4049	0.5251	0.5148	0.4243
2012			0.5844	0.5805	0.5550	0.7217	0.5362	0.5589	0.4816	0.6353	0.6192	0.5905	0.5756	0.4945	0.5776	0.5980	0.5345
2013		0.6335	0.6449	0.5785	0.5648	0.6135	0.6145	0.6259	0.5315	0.6826	0.6212	0.5734	0.5534	0.4739	0.5591	0.6146	0.4515
2014	0.5452	0.5405	0.6954	0.5929	0.5467	0.6319	0.5889	0.5813	0.5126	0.6971	0.5491	0.5314	0.5665	0.6812	0.5434	0.6101	0.4601
2015	0.7242	0.4136	0.6804	0.6459	0.4718	0.6986	0.6199	0.6457	0.5955	0.7161	0.6250	0.5740	0.5393	0.9146	0.5818	0.6740	0.4576
2016	0.6801	0.6875	0.6961	0.6453	0.5971	0.6862	0.7094	0.6931	0.5625	0.6156	0.6887	0.6461	0.5956	0.7277	0.5578	0.6767	0.4949
2017	0.6699	0.5548	0.6925	0.6306	0.6204	0.7073	0.7022	0.6380	0.5349	0.6633	0.7403	0.7178	0.6814	0.7005	0.6509	0.7380	0.4304
2018	0.6701	0.7341	0.6784	0.6341	0.5681	0.6979	0.6621	0.6496	0.5862	0.6339	0.7338	0.6443	0.6975	0.5838	0.6471	0.7204	0.3972
2019	0.7211	0.6958	0.7511	0.6649	0.5095	0.7822	0.6827	0.7229	0.6577	0.7027	0.6987	0.7432	0.7383	0.6127	0.7284	0.7928	0.3976

| 2020 | 0.7791 | | | 0.7301 | 0.6690 | 0.8474 | 0.7657 | 0.7484 | 0.6273 | 0.7664 | 0.7880 | 0.7847 | 0.7821 | 0.6631 | 0.7881 | 0.8115 | |

CHART 6 : TLTD of each bank over the years


Chart Title

The above chart shows that usage of loan to deposit ratio has been constant over the period except for DGB in the year 2015 in which year the bank has shown a position over 80% and also CBE has shown the lowest position in the year 2019 which is about 40%.

4.2.7 The trend of TLTA over the years

Table 10 : TLTA of each bank over the years

6	ENAT	DGB	ADIB	ABAY	ZEMEN	BUIB	BRIB	LIB	OIB	NIB	WB	UB	BOA	COOP	DB	AB	CBE
2011			0.3638	0.3461	0.3637	0.4690	0.3631	0.3741	0.3373	0.3890	0.3610	0.4242	0.4556	0.3207	0.4241	0.3941	0.3149
2012			0.3580	0.3653	0.3999	0.4776	0.3887	0.3941	0.3658	0.4482	0.4272	0.4649	0.4730	0.3769	0.4637	0.4612	0.3924
2013		0.2636	0.4047	0.4322	0.4230	0.4461	0.4455	0.4480	0.4145	0.4968	0.4512	0.4718	0.4622	0.3238	0.4488	0.4795	0.3568
2014	0.3575	0.3091	0.4499	0.4613	0.4216	0.4514	0.4211	0.4323	0.4170	0.5139	0.3994	0.4269	0.4570	0.5051	0.4375	0.4582	0.3657
2015	0.5131	0.2963	0.4318	0.5044	0.3643	0.5436	0.4559	0.4912	0.5000	0.5280	0.4500	0.4777	0.4387	0.5879	0.4655	0.5229	0.3637
2016	0.5002	0.4639	0.4631	0.4968	0.4684	0.5417	0.5221	0.5407	0.4661	0.4831	0.4713	0.4942	0.4826	0.5780	0.4443	0.5218	0.3729
2017	0.5086	0.3850	0.4879	0.4901	0.4616	0.5387	0.5083	0.5101	0.4404	0.5180	0.4954	0.5477	0.5570	0.5643	0.5223	0.5379	0.3206
2018	0.5144	0.4848	0.4855	0.4786	0.4302	0.5332	0.5112	0.5280	0.4909	0.5135	0.5494	0.5375	0.5625	0.5041	0.5126	0.5664	0.3128
2019	0.5578	0.4468	0.5364	0.5029	0.4178	0.5713	0.5328	0.5812	0.5503	0.5766	0.5526	0.6079	0.6040	0.5302	0.5795	0.6332	0.3017
2020	0.5824			0.5748	0.5295	0.6131	0.5955	0.6154	0.5141	0.6073	0.6214	0.6389	0.6547	0.5750	0.6176	0.6415	

CHART 7 : TLTA of each bank over the years
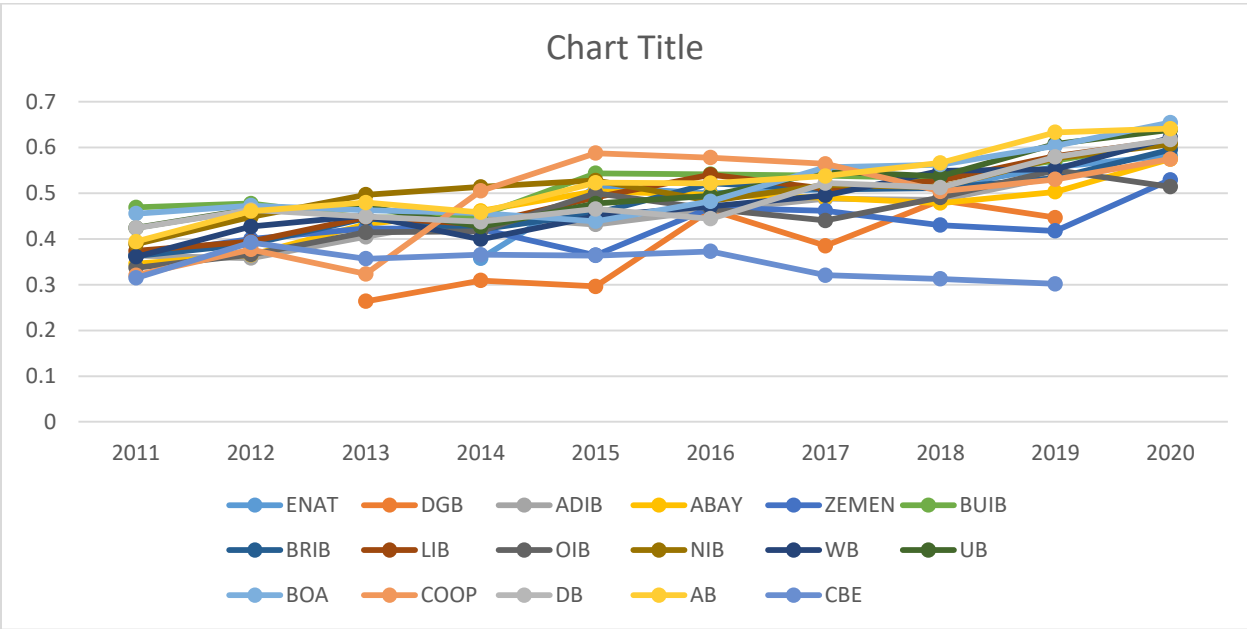
The above table and chart shows that the loan to asset ratio os the lowest for CBE in the year 2019 while DGB has the lowest starting point but on the ends of the studied period almost all the banks show a similar position i.e over 40% except CBE which is around 30%.

In addition it is shown that the mean of ROA & ROE are 2.7679 & 20.9915 respectively. Higher standard deviations of all profitability indicators are evident that performance among commercial banks is different from each other. The negative ROE & ROA's in some banks reveal that all commercial banks fail to generate consistent positive profits over the year 2011 through 2019. Poor performance may be an indicator of inefficient asset management or an ineffective business model. Having a high ROE is usually determined by holding sufficient liquidity, by having efficient asset management and undertaking a proper use of the debts (Brightam & Houston, 2009). In addition, financial stability and economic growth can be increased by efficient intermediation of banks, while the occurrence of insolvency might lead to economic crisis (Banna et al., 2017). During the study period, the substantial increase in loan loss reserves directly is observed while along with it a net loans and outstanding also has been increasing at a faster trend, however the increase in loan loss provision   leads to a decline in ROA and ROE. The variation in the standard deviations of the profitability indicators show that Ethiopian commercial banks profit making capacity is different from each other. High standard deviations

of credit risk indicators show that credit risk management quality is different among the banks. The LLPTL ratio among the commercial banks is varied from 0.00 to 15.89 with the mean and standard deviation 0.34 and 1.52 respectively. It shows that there is volatility among the banks' ability in credit risk management. A higher credit risk ratio indicates poor credit management and subsequently poor loan quality. The ratio of TLTA among the banks is varied from 0.65 percent to 0.26 with the mean and standard deviation 0.47 and 0.08 respectively which indicates TLTA ratio is different among the banks but with narrow variation. The value of the standard deviation indicates relatively low variation among the banks in the ratio of TLTD, which is 0.98. The ratio of TLTD is used to determine the viability of the bank after accepting the deposits withdrawn by its customers, and the bank's ability to meet loan demand by reducing its liquid assets (Kishori & Sheeba, 2017). The higher ratio of TLTD may lower bank profitability. Bank size recorded a standard deviation value of 1.52, which indicates the dataset of the study is not as largely spread from the mean value.

4.3 Regression analysis

4.3.1. Testing the Assumptions of Multiple Linear Regression Model

Assumption #1: The Dependent Variable is Normally Distributed

The first assumption of the multiple regressions tested was whether or not the dependent variable is normally distributed. This assumption can be tasted using Kolmogorov-Smirnov tests of normality produced by SPSS. If the probability value for this test is non-statistically significant (i.e.,$P>0.005$), it can be concluded that the dependent variable is normally distributed.

CHART: Tests of Normality of the Dependent Variable
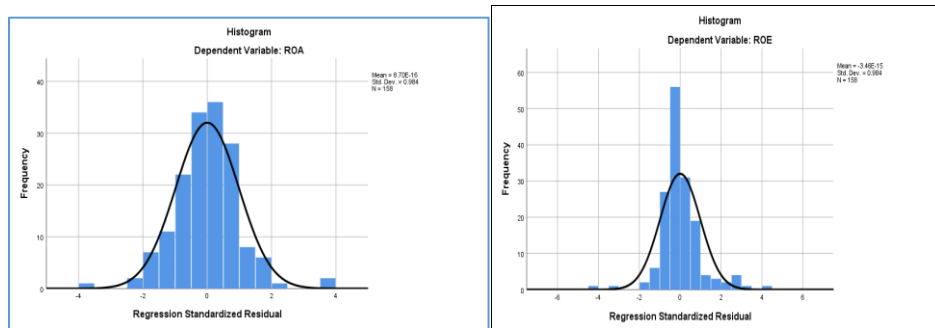
Source: Survey data, 2022

GRAPH 1: Tests of Normality of the Dependent Variable
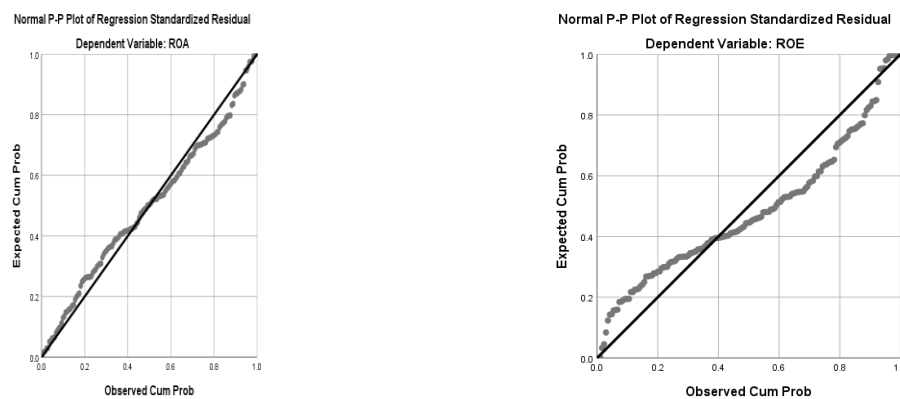
In linear regression the assumption that is the residual are normally distributed. It is important to meet this assumption for the p-values for the t-tests to be valid. P-P plot compares the observed cumulative distribution function (CDF) of the standard residuals to the expected CDF of the normal distribution. As shown in the figure below both normality plot and the histogram show that the predictor variables in the regression have a straight line relationship with the outcome variable. Therefore the assumption of normality is satisfied.

Assumption #2: There is no Multicollinearity in the Data.

The second test run using SPSS was multicollinearity which is used to test if there is multicollinearity in the data.

Table 11: Correlations for each variables

Correlations							
		ROA	CAR	LLPTL	TAL	TLTD	TLTA
Pearson Correlation	ROA	1.000	.180	.089	-.378	-.043	-.238
	CAR	.180	1.000	.009	-.474	.061	-.031
	NPLSTL	.089	.009	1.000	.157	-.345	-.272
	TAL	-.378	-.474	.157	1.000	-.003	.267
	TLTD	-.043	.061	-.345	-.003	1.000	.678
	TLTA	-.238	-.031	-.272	.267	.678	1.000
		ROE	CAR	NPLSTL	TAL	TLTD	TLTA
Pearson Correlation	ROE	1.000	.008	.256	.409	-.336	-.227
	CAR	.008	1.000	.009	-.474	.061	-.031
	NPLSTL	.256	.009	1.000	.157	-.345	-.272
	TAL	.409	-.474	.157	1.000	-.003	.267
	TLTD	-.336	.061	-.345	-.003	1.000	.877
	TLTA	-.227	-.031	-.272	.267	.877	1.000

Source: Survey data, 2022

As we can see at the Correlations table above, there is no correlations of more than 0.8, as the highest correlation is r = 0.678. Therefore, we can conclude that there is no multicollinearity in the data, thus, the assumption of multiple regression is satisfied.

Assumption #3: The Values of the Residuals are Independent.

Durbin-Watson statistic was used to test the assumption that the residuals are independent (or uncorrelated). This statistic can vary from 0 to 4. For assumption #3 to be met, we want this value to be close to 2.

Table 12: Model Summary of Factors affecting profitability of banks

Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.474[a]	.224	.199	.75526	1.485
a. Predictors: (Constant), TLTA , CAR , NPLSTL , TAL , TLTD					
b. Dependent Variable: ROA					

| Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.604[a]	.364	.344	9.07068	1.715
a. Predictors: (Constant), TLTA , CAR , NPLSTL , TAL , TLTD					
b. Dependent Variable: ROE					

Source: Own Analysis Using SPSS, 2022

As indicated in table 4.10 model summery above, the value of Durbin-Watson statistic is 1.715 so we can conclude that the assumption which states the values of the residuals should be independent has been met.

Assumption #4: The Variance of The Residuals is Constant (Test of Homoscedasticity)

The fourth assumption of multiple regression tested was test of homoscedasticity, which is the assumption that the variation in the residuals (or amount of error in the model) is similar at each point of the model.

Figure 4.1 Scatterplot of Dependent Variable: ROA
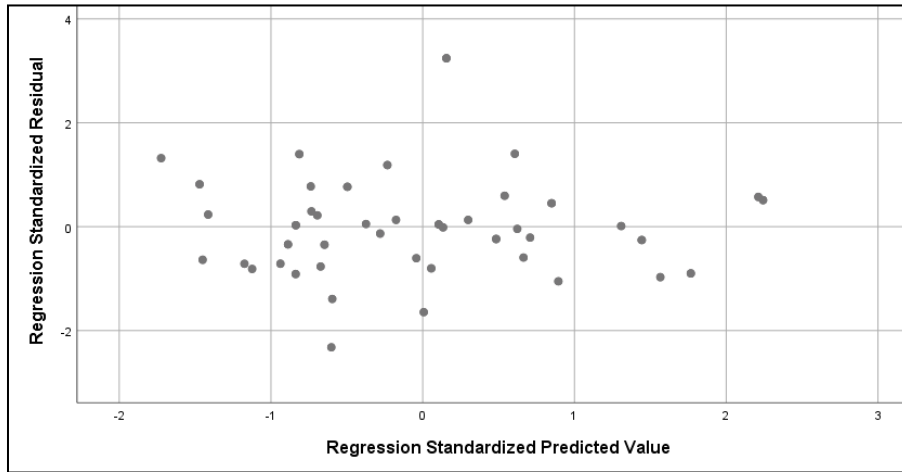
Source: Own Analysis Using SPSS, 2022
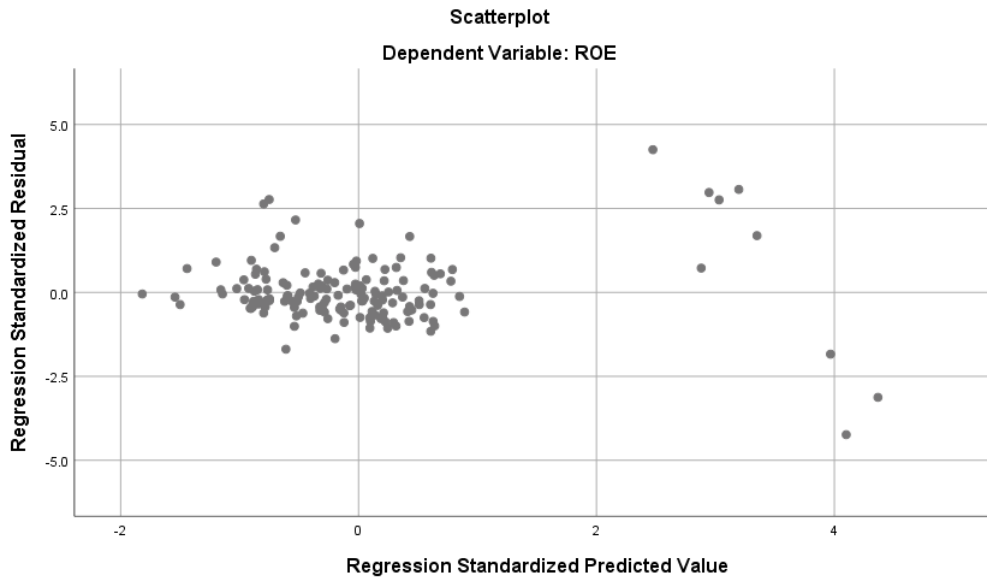
The scatterplot graph depicted in Figure 4.1 above, plots the standardized values our model would predict, against the standardized residuals obtained. As it can be observed from the graph as the predicted values increase (along the X-axis), the variation in the residuals is roughly similar. Therefore, since plot of standardized residuals vs standardized predicted values showed no signs of funneling, suggesting the assumption of homoscedasticity has been met.

Assumption #5: There are no Influential Cases Biasing the Model

The final assumption tested if there are influential cases biasing the model. This assumption is tested using Cook's Distance values in the Residual Statistics table produced by SPSS.

Table 13: Residuals Statistics for ROA

Residuals Statistics					
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	10.0452	51.9825	22.4299	6.77908	158
Std. Predicted Value	-1.827	4.359	.000	1.000	158
Standard Error of Predicted Value	.734	9.055	1.530	.881	158
Adjusted Predicted Value	10.0674	56.6390	22.4240	6.95614	157
Residual	-38.46146	38.43517	.00000	8.90923	158
Std. Residual	-4.248	4.245	.000	.984	158
Stud. Residual	-4.529	4.380	.012	1.030	158
Deleted Residual	-43.72632	40.92944	-.01137	9.55437	157
Stud. Deleted Residual	-4.854	4.671	.001	1.049	157
Mahal. Distance	.039	156.006	4.968	13.288	158
Cook's Distance	.000	.468	.012	.051	157
Centered Leverage Value	.000	.994	.032	.085	158
a. Dependent Variable: ROE					

Source: Own Analysis Using SPSS, 2022

Table 14: Residuals Statistics for ROE

Residuals Statistics					
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	2.2619	4.8173	2.9739	.39986	158
Std. Predicted Value	-1.781	4.610	.000	1.000	158
Standard Error of Predicted Value	.061	.755	.128	.074	158
Adjusted Predicted Value	2.2838	4.7201	2.9663	.37966	157
Residual	-2.76039	3.08289	.00000	.74310	158
Std. Residual	-3.655	4.082	.000	.984	158

Stud. Residual	-3.846	4.151	.006	1.014	158
Deleted Residual	-3.05635	3.18838	-.00413	.78359	157
Stud. Deleted Residual	-4.035	4.394	-.001	1.031	157
Mahal. Distance	.039	156.006	4.968	13.288	158
Cook's Distance	.000	.264	.009	.031	157
Centered Leverage Value	.000	.994	.032	.085	158
a. Dependent Variable: ROA					

Cook's Distance value in the residual statistics indicates that if there are any Cook's Distance values over 1, it is likely to be significant outliers, which may place undue influence on the model. Accordingly, as table 4.11 shows, Cook's Distance values were all under 1, suggesting individual cases were not unduly influencing the model. Therefore, we can conclude that the sixth assumption of the multiple regression has been satisfied.

4.4 Results of Regression Analysis

4.4.1. Determining How Well the Model Fits

In order to identify quality of the prediction of the dependent variable and how well variance in the dependent variable that can be explained by the independent variables the values in the model summary of the regression output were analyzed. Therefore, as shown in the model summary table 4.7, bellow, the value of the multiple correlation coefficient (**R**) which is one measure of the quality of the prediction of the dependent variable, has the value of 0.474, indicating a good level of prediction. Hence we can conclude that the level of production is in a good range of prediction.

Table 15: Model Summary of credit risk related factors affecting profitability in Ethiopian Commercial banks for ROA

Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.474[a]	.224	.199	.75526	1.485
a. Predictors: (Constant), TLTA , CAR , NPLSTL , TAL , TLTD					
b. Dependent Variable: ROA					

Table 16: Model Summary of credit risk related factors affecting profitability in Ethiopian Commercial banks for ROA

Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.604[a]	.364	.344	9.07068	1.715
a. Predictors: (Constant), TLTA , CAR , NPLSTL , TAL , TLTD					
b. Dependent Variable: ROE					

Source: Own Analysis Using SPSS, 2022

Moreover, the adjusted R^2 value (also called the coefficient of determination), which measures the proportion of variance in the dependent variable that can be explained by the independent variables, is 0.344. That means independent variables of the model (LLPTL, CAR, LnTA, TLTD, TLTA) explain 47.4% of the variability of the dependent variable (ROA). And also the independent variables of the model (LLPTL, CAR, LnTA, TLTD, and TLTA) explain 60.4% of the variability of the dependent variable (ROE).

Table 17: ANOVA Test for Factors Affecting profitability for ROA

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	25.096	5	5.019	8.799	.000[b]
	Residual	86.702	152	.570		
	Total	111.799	157			
a. Dependent Variable: ROA						
b. Predictors: (Constant), TLTA , CAR , NPLSTL , TAL , TLTD						

Table 18: ANOVA Test for Factors Affecting profitability for ROE

	ANOVA[a]					
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7170.726	5	1434.145	17.431	.000[b]
	Residual	12506.142	152	82.277		
	Total	19676.868	157			
a. Dependent Variable: ROE						
b. Predictors: (Constant), TLTA , CAR , NPLSTL , TAL , TLTD						

Source: *Own Analysis Using SPSS*, **2022**

Furthermore, ANOVA tests were applied in order to analyze the goodness of fit of the regression model. As indicated in Table 4.8 above, the *F*-ratio, which tests whether the overall regression model is a good fit for the data, shows that the independent variables statistically significantly predict the dependent variable, $F(5, 95) = 8.79$, $p < .0005$ (i.e., the regression model is a good fit of the data) for ROA and $F(5, 95) = 17.43$, $p < .0005$ (i.e., the regression model is a good fit of the data) for ROE.

4.4.2 Estimated model coefficients

This section discusses the regression results of the effect of independent variables (loan loss provision , capital adequacy ratio , Ln. of total asset as a measure of bank size , total loan to total deposit ratio and total loan to total asset ratio on the dependent variable (ROA as a proxy measure for profitability) in Ethiopian commercial banks.

Table 19: Estimated model coefficients for ROA

	Coefficients					
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-28.598	11.051	-	-2.588	0.011
	LLPTL	-4.14	64.125	-0.047	0.673	0.042
	CAR	1.398	0.349	0.3	4.006	0

TAL	4.646	0.656	0.637	7.082	0
TLTD	-3.489	18.06	-0.031	-0.193	0.847
TLTA	-48.755	23.031	-0.348	-2.117	0.036
a. Dependent Variable: ROE					

Table 20: Estimated model coefficients for ROE

Coefficients					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	4.946	0.92	-	5.375	0
LLPTL	-9.867	5.339	-0.144	1.848	0.047
CAR	0.007	0.029	0.02	0.239	0.811
TAL	-0.123	0.055	-0.224	-2.26	0.025
TLTD	4.689	1.504	0.547	3.119	0.002
TLTA	-6.519	1.918	-0.618	-3.4	0.001
a. Dependent Variable: ROA					

Source: *Own Analysis Using SPSS*, **2022**

ROE= $\alpha+\beta1$LLPTL+ $\beta2$CAR + $\beta3$ln TA+ $\beta4$TLTD+ $\beta5$TLTA+ ε

Where: Y= Return on equity (ROE); α = Constant, β= Coefficient factor, X1= loan loss provision to term loan ratio , X2= Capital adequacy ratio , X3= ln of total asset (bank size) , X4= Total loan to total deposit ratio (TLTD), X5 = total loan to total asset ratio (TLTA), ẹ = Error Term

By replacing the result of Estimated model coefficients in table xxx above we found the following regression result,

Y= -28.598 -4.14X₁ -28.56X₂ + 4.65 X₃ -3.49 X₄ .48.76X₅ + e

As the multiple linear regression result shown in Table 4.2 above, *LLPTL , CAR, LNTA, ,TLTA were statistically significant factors (P < 0.05) in affecting loan collection performance of the*

banking industry were statistically significant factors (P < 0.05) in affecting profitability of the banking industry.

Hence a one percent increase in LLPTL decreases ROE by 414% which is the proxy for profitability. In addition one percent increase in CAR, TLTD and TLTA decreases ROE by 28.56, 3.49 and 48.76 percentage points. From these variables we can see that the effect of TLTD has the highest negative effect on the banks' equity position while TLTD has the lowest negative effect. The only variable that affects profitability positively is the asset position of the banks in which case a one percent increase in the asset position TA increases the ROE by 465 percent. Therefore to have a good effect on profitability banks needs to decrease the ratio of TLTA which means they have to increase their capital or leverage position while they increase their asset position. Along with this banks need to reduce or manager their NPL position so as to reduce the negative effect of NPL position.

From the model coefficients obtained from table above, the established regression equation was:

ROA= α+β1LLPTL+ β2CAR + β3ln TA+ β4TLTD+ β5TLTA+ ε

Where: Y= Return on asset (ROA); α = Constant, β= Coefficient factor, X1= LLPTL, X2= Capital adequacy ratio, X3= Ln. of total asset (bank size) , X4= Total loan to total deposit ratio (TLTD), X5 = total loan to total asset ratio (TLTA), ę = Error Term

By replacing the result of Estimated model coefficients in table xxx above we found the following regression result,

Y= 4.95 -9.87X_1 +0.007X_2 -0.12 X_3 + 4.69 X_4 -6.52X_5 + e

As the multiple linear regression result shown in Table 4.1 above, *LLPTL LNTA, TLTD ,TLTA* were statistically significant factors (P < 0.05) in affecting loan profitability of the banking industry.

One percent increase in LLPTL decreases ROA by 987 % points which is the proxy for profitability. In addition increase in asset position without in absolute terms and as a ratio of loans and advances has a negative effect on profitability of the banks while the highest negative effect comes from NPLs position. Hence banks should reduce and ore manage their

NPLs position along with high increasing pattern of asset and loans and advances to have a positive effect on profitability

4.5 Hypothesis testing

$H0_1$: Credit risk management proxied by LLPTL has no effect on profitability proxy by ROE

As shown in the estimated model coefficients table above ROE and LLPTL has negative and significant relationship (B=-4.14, P<0.05) therefore the null hypothesis H01 is rejected and thus alternative hypothesis is accepted

$H0_2$: credit risk management proxied CAR has no effect on profitability proxied by ROE

As shown in the estimated model coefficients table above ROE and CAR has significant and positive relationship (B=1.39, P<0.05) therefore the null hypothesis H01 is rejected and thus alternative hypothesis is accepted.

$H0_3$: Credit risk proxied Ln TA has no effect on profitability proxied by ROE.

As shown in the estimated model coefficients table above ROE and LnTA has positive and significant relationship (B=4.65, P<0.05) therefore the null hypothesis H06 is rejected and thus alternative hypothesis is accepted.

$H0_4$: Credit risk management proxied by TLTD has no effect on profitability proxied by ROE

As shown in the estimated model coefficients table above ROE and TLTD has negative and insignificant relationship (B=-3.49, P>0.05) therefore the null hypothesis H04 is accepted

$H0_5$: credit risk management proxied by TLTA has no effect on profitability proxied by ROE

As shown in the estimated model coefficients table above ROA and TLTA has negative and significant relationship (B=-48.76, P<0.05) therefore the null hypothesis H06 is rejected and thus alternative hypothesis is accepted

$H0_6$: Credit risk management proxied LLPTL has no effect profitability proxied by ROA

As shown in the estimated model coefficients table above ROA and LLPTL has negative and significant relationship (B=-9.87, P<0.05) therefore the null hypothesis H06 is rejected and thus alternative hypothesis is accepted.

H0₇: Credit risk management proxied CAR has no effect on profitability proxied by ROA

As shown in the estimated model coefficients table above ROA and CAR has positive and insignificant relationship (B=1.4, P>0.05) therefore the null hypothesis is accepted.

H0₈: credit risk management proxied LnTA has no effect on profitability proxied by ROA

As shown in the estimated model coefficients table above ROA and LnTA has negative and significant relationship (B=-0.12, P<0.05) therefore the null hypothesis H06 is rejected and thus alternative hypothesis is accepted.

H0₉: credit risk management proxied TLTD has no effect on profitability proxied by ROA

As shown in the estimated model coefficients table above ROA and TLTD has positive and significant relationship (B=4.69, P<0.05) therefore the null hypothesis H06 is rejected and thus alternative hypothesis is accepted.

H0₁₀: Credit risk management proxied TLTA has no effect on profitability proxied by ROA

As shown in the estimated model coefficients table above ROA and TLTA has negative and significant relationship (B=-6.52, P<0.05) therefore the null hypothesis H06 is rejected and thus alternative hypothesis is accepted.

Chapter Five:

5. Summary of Findings, Conclusion and Recommendation

This chapter presents the summary of the findings of the study, conclusions drawn from the analysis and forwards recommendation for policy implication.

5.1 Summaries of findings

The purpose of this study was to analyze the effect of credit risk management on profitability of Ethiopian commercial banks currently operating in the county. To achieve the research objective the study has employed a descriptive & quantitative research approach by taking a time series data of 10 years panel data from the annual financial report of each bank and from national bank of Ethiopia database. The collected data were processed by SPSS version 25.

The descriptive analysis of the study shows that ROA and ROE of all banks that are included in the study have been increasing constantly over the studied period. In addition, the credit risk related variables (bank specific factors included in the study) i.e LLP,TL, TA,TD has been also increasing.

The regression analysis of the study shows that profitability when measured by ROA & ROE has been significantly affected by bank specific credit risk related factors. Specifically ROA is affected by LLP and TA negatively whereas by TLTD, TLTA positively.

Furthermore, our findings showed that there is a negative relationship between LLP and ROE as well as between LLP and ROA. This is consistent with most of the previous related researches. This relationship indicates that the higher the LLP, the higher the expense for banks, and thus the lower profitability for banks.

5.2 Conclusion

A balanced panel data of 17 commercial banks over the period 2011–2019 was used to investigate the effects of credit risk indicators such as loan loss provision ratio and capital

adequacy ratio on ROA, ROE in Ethiopian commercial banks. And it is found that these variables i.e LLPTL, CAR, TA, TLTD and TLTA ratios have significant effect on profitability of commercial banks currently operating in Ethiopia. Therefore managing the credit risk elements of the banks have significant effect in increasing the profit of the banks found in Ethiopia and the industries profit margin as a whole.

Accordingly LLPTL has negative and significant effect on profitability of commercial banks as measured by both ROE & ROA. In addition as shown in the descriptive analysis whenever there is a decline in ROE and ROA there shown to be high amount of LLPTL ratio for individual banks specially it is seen in CBE and DGB in the year 2013 and 2015.

CAR has positive and significant effect on profitability when measured by ROE while it has positive but insignificant effect on profitability of commercial banks as measured by ROA

TA has positive and significant effect on ROE and it has negative and significant effect on profitability of commercial banks as measured ROA

TLTD in significant effect on ROE but has positive and significant effect on profitability of commercial banks as measured by ROA

TLTA has negative and significant effect on profitability of commercial banks as measured by both ROE & ROA

The observed effects align with previous researches and theories specially for LLPTL and CAR while the effect of the other variables is mixed and not very strictly aligned with previous researches and theoretical conclusions. Hence further studies with regard these other variables need to be undertaken to reach on some kind of uniform conclusion.

5.3 Recommendation

➢ Bank managers should take the necessary action to control loan loss provision which arises from non-performing loans which might adversely affects profitability the bank.

➢ The management should give due concern for increasing trends of asset amount in relation to loan provision because undue increment in asset position might entail additional expenses which will result in reducing profitability.

➢ The national bank of Ethiopia should give due attention to regulate the asset increment rate so as to control its negative effect on profitability.

➢ The national bank of Ethiopia should give due to attention and set a proper regulating mechanism to identify the ways through which banks undertake NPL managing methods. It can be observed from the banks panel data that the banks keep the NPL percentage point only to comply with the NBE directive regarding NPL percentage which might come in the expense of deteriorating asset quality and compromising the asset quality might have a negative effect on the overall economy of the country.

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