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**The Effect of Credit Risk on Financial Performance of Ethiopian Private Commercial Banks**

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

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June 2020

Addis Ababa, Ethiopia

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**DECLARATION**

I, the undersigned, declare that this thesis is my original work, prepared under the guidance of Dr.Abebaw Kassie (Phd). All sources of materials used for this thesis have been dually acknowledged. I further confirm that the thesis has not been submitted either in part or in full to any other higher learning institutions for the purpose of any degree.

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**ENDORSEMENT**

This thesis has been submitted to St. Mary’s University, School of Graduate Studies for examination with my approval as a university advisor.

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***Abstract***

*The main objective of this study was to analyze the impact of credit risk on financial performance of Commercial private banks in Ethiopia. In order to accomplish these study quantitative approach was employed and a panel data from fourteen banks was used which covers the time period of 2013 to 2019. By using hausman test fixed effect model was selected as a best model and the analysis was done using Eviews software version 8. The study used return on asset as a dependent variable proxy of financial performance and loan loose provision ratio as a proxy of credit risk. Other control variables included are capital adequacy ratio, total deposit to total asset, real gross domestic product growth rate and inflation rate. To accomplish the study both descriptive and regression analysis specifically fixed effect model was used to analyze the relationship between dependent and independent variables. The findings of fixed effect regression result indicated that bank credit risk which is proxy by loan loose provision ratio have negative and significant impact on banks profitability proxy by return on asset. Capital adequacy ratio, total deposit to total asset, real gross domestic product growth rate inflation rate have a positive and significant impact on bank profitability which is proxy by return on asset. Banks size which is proxy by total asset is insignificant to affect banks profitability which proxy by return on asset. Accordingly, the researcher recommend that commercial banks’ policy makers and top managements need to strength their credit risk management capacity and fully anticipate the impact of real gross domestic product growth rate and inflation rate to maximize their profitability.*

***Keywords: Credit risk, Bank Performance, Panel Model, Fixed Effect Model***

**LIST OF ACRONYMS AND ABRIVATIONS**

CAMEL: Capital Asset Management

CAR: Capital Adequacy Ratio

CLRM: Classical Linear Regression Model

DW: Durbin-Watson

GDP: Gross Domestic Product

INF: General Inflation Rate

JB: Jarque-Bera

LLP: Loan Loss Provision

LNTA: Logarithm of Total Asset

LTDR: Loan to Deposit Ratio

NIM: Net Interest Margin

NPL: Non-performing Loans

NPLR: Non-performing Loan Ratio

OLS: Ordinary Least Square

ROA: Return on Assets

ROE: Return on Equity

TA: Total Asset

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# CHAPTER ONE

# 1. INTRODUCTION

## 1.1 Background of the study

In current economy context, establishing an accessible, efficient and competitive financial system is very crucial to facilitate domestic saving so as sustain the fast and sustainable economic growth. Levine (2005) suggests that financial institutions (such as banks and insurance companies) and financial markets (including stock markets, bond markets, and derivative markets) exert a powerful influence on economic development, poverty alleviation, and economic stability.

When looking to Ethiopia case, banks are engines of economic growth. Currently, 18 banks operating in Ethiopia, from which 16 are private owned and the remaining 2 are state-owned. Total capital of the banking industry increased by 18.4 percent and reached Birr 101.5 billion by the end of June 2019. Total resources mobilized by the banking system in the form of deposit, borrowing and loan collection increased by 3.4 percent and reached Birr 308.3 billion at the end of 2018/19. Their total outstanding borrowing at the end of the fiscal year was Birr 72.2 billion up from Birr 65 billion a year earlier. Total outstanding credit of the banking system (including to the central government) increased by 24 percent and reached Birr 556.6 billion at the end of June, 2019 (NBE, 2019).

The financial sector has gone through a significant transformation over the last few decades. The rapid transformation and changing regulatory environments has resulted in a highly complex ecosystem. Due to the occurrence of particular events such as accelerated growth, innovation, modernization, stiff competition and regulations, banks are exposed to high levels of several financial risks. According to Aboli (2015), there are eight types of risks banks normally face in their day to day operation. These are credit risk, market risk, operational risk, liquidity risk, business risk, reputational risk, systematic risk and moral hazard. Among these risks credit risk is important because of its effect on the viability of a bank jointly or separately.

Credit remains the primary source of revenue for any bank around the world. However, credit risk is the most significant risk faced by banks and the success of their business depends on accurate measurement and efficient management of this risk to a greater extent than any other risks. According to (Basel Committee on Banking Supervision Basel, 2000) credit risk is simply defined as the potential that a bank borrower or counterparty will fail to meet its obligations in accordance with agreed terms.

In order to survive in this competitive global banking industry, it is imperative for each bank to formulate and implement effective credit risk management policies, procedures and strategies. “A bank’s capacity for credit risk management contribute significantly to the quality of its risk management policies” (Van Greuning and Bratanovic, 2009,).

Since exposure to credit risk continues to the leading source of problems in Ethiopia banking system, banks and their supervisors should be able to draw useful lessons from past experiences. Banks should now have a keen awareness of the need to identify, measure, monitor and control credit risk as well as to determine that they hold adequate capital against these risks and that they are adequately compensated for risks incurred. The effective management of credit risk is a critical component of a comprehensive approach to risk management and essential to the long-term success of any banking organization. Therefore, it is very essential to assess the credit risk on the bank’s performance. As a result, this paper tried to analysing the credit risk and their effects on financial performance of Ethiopian Private Banks.

## 1.2 Statement of the Problem

For most banks, loans are the largest and most obvious source of credit risk; however, other sources of credit risk exist throughout the activities of a bank, including in the banking book and in the trading book, and both on and off the balance sheet. Banks are increasingly facing credit risk (or counterparty risk) in various financial instruments other than loans, including acceptances, interbank transactions, trade financing, foreign exchange transactions, financial futures, swaps, bonds, equities, options, and in the extension of commitments and guarantees, and the settlement of transactions (Basel Committee on Banking Supervision Basel, 2000)

The bank credit risk and how it affects the performance of the bank has been conducted by several authors. Muriithi et.al (2016) assessed the effect of credit risk on financial performance of commercial banks in Kenya. The study covered the period between year 2005 and 2014. Credit risk was measured by capital to risk weighted assets, asset quality, loan loss provision, and loan and advance ratios and financial performance by return on equity (ROE). The study used the balance sheets components and financial ratios for 43 commercial banks in Kenya registered by year 2014. Panel data techniques of fixed effects estimation and generalized method of moments (GMM) were used to purge time–invariant unobserved firm specific effects and to mitigate potential endogeneity problems. The results shows credit risk has a negative and significant relationship with bank profitability. Poor asset quality or high non-performing loans to total asset is related to poor bank performance both in short run and long run.

In Uganda, Serwadda (2018) set to analyse the impact of credit risk management on the financial performance of commercial banks in Uganda for a period of 2006–2015 using panel data for a sample of 20 commercial banks. The study employs return on assets as a dependent variable and non‑performing loans, growth in interest earnings and loan loss provisions to total loans as credit risk measures. The study employed descriptive statistics, regressions and correlation analysis. The study revealed that credit risk management impacts on the performance of Ugandan commercial banks. The results portrayed that banks’ performance was inversely influenced by non‑performing loans which may expose them to large magnitudes of illiquidity and financial crisis.

In Ethiopia, Engdawork (2014) empirically examine the quantitative effect of credit risk on the performance of commercial banks in Ethiopia, considering variables related to lending activities, over the period of 5 years (2008-2012). The empirical investigation used the accounting measure of Return on Assets (ROA), which is the dependent variable, to represent Banks’ performance. The study fundamentally involves both descriptive and econometrics techniques. The econometrics method used in the study basically involves assessing the impact of selected internal variables, the provision to total loans, loan to total asset, credit administration (cost to total loans) and natural logarithm of total asset (Economies of scale), on the performance of the banking sector. The study found that the selected variables: the provision to total loans, loan to total asset, credit administration (cost to total loans) and Size (Economies of scale) have significant effect on the performance of Banks. However, a certain variation in the magnitude and direction of their effect on the selected profitability measure, Return on Asset.

Furthermore, Bruke (2018) analyse the impact of credit risk management on the financial performance of selected commercial banks and to establish if there exists any relationship between the credit risk management determinants of CAMEL indicators and financial performance (measured by return on equity) of commercial banks in Ethiopia. The study used multiple regression analysis in the analysis of data. The study found that capital adequacy, asset quality and liquidity had weak relationship with financial performance (ROE) while management efficiency had moderate relationships with financial performance. Earnings had a strong relationship with financial performance.

Literature recognizes that factors influencing credit risk can be distinguished into external factors and internal factors. Empirical literature identifies macroeconomic, bank-specific and industry-specific variables as factors affecting credit risk. Garr (2013) establish in a study, that bank ownership and management efficiency as the bank specific factors, while industry specific factors are financial sector development and competition. The macroeconomic variables considered are inflation, gross domestic product growth rate. While a number of studies researched on credit risk impact on the Ethiopian commercial banks’ performance such as Engidawork (2014) and Bruke (2018) were done by considering all commercial banks in Ethiopia without classifying them private and public even if the strength and profitability of the private sector in this case private banks are very important. Therefore, this research tried to fill this gap by identifying the impact of credit risk on private commercial banks profitability with an appropriate model that would contribute the policy making and devise risk mitigating mechanisms for Ethiopian private banks and in general the Ethiopian banking industry.

## 1.3 Objective of the study

### 1.3.1. General objective

The general objective of the study was to examine the effect of credit risk on banks’ financial performance.

### 1.3.2. Specific objective

* To identify the effect of loan loss provision ration on financial performance of Ethiopian private banks
* To identify the effect of capital adequacy on the financial performance of Ethiopian private banks,
* To identify the effect of real GDP growth rate on financial performance of Ethiopian private banks,
* To identify the effect of inflation rate on financial performance of Ethiopian private banks,
* To identify the impact of bank size proxy by total asset on financial performance of Ethiopian private banks,

## 1.4. Research Hypothesis

## 1.4.1. Hypothesis 1: Credit Risk and Bank Profitability

Credit risk occurs from the latent that a borrower is either reluctant to carry out a commitment or capability to carry out such obligation is decreased, resulting in economic loss to the bank. Heffernan (1996) stressed that credit risk is the threat that a loan may not returned, in the case of total lost or the risk of impediment in refunding of loans and advances the continual occurrence of this default affects banks performance. The firm characteristics theory position that the main noticeable distinctiveness of failed banks is not pitiable operating competence rather it is an improved size of loose loan provision ratio. The incidence of loose loan provision ration is considered as losses for the bank and Higher loose loan provision ration adversely influence the banks on hand capital for additional borrowing capability and decrease banks investment which further influencing the profitability. The pervasive incidence of loose loan provision ration is one of the main sources of collapse in the financial system (Saunders and Cornett, 2005).

Credit risk is by far the major significant risk countenance by banks and their success depends on truthful measurement and competent management of this risk to a better extent than any other risk. Increase credit risk increases the marginal cost of debt and equity, which in turn increases the outlay of funds for the bank. The Basel Committee on Banking Supervision (1999) asserts that loans are the principal and most obvious foundation of credit risk, while others are found on the various activities that the bank involved itself with (Basel Committee, 1999). Therefore, it is a prerequisite for every bank worldwide to be aware of the need to recognize measure, monitor and manage credit risk while also determining how credit risks could be lowered.

The association between credit risk and performance in banking is investigated in many studies. Credit risk (i.e. proxy by loose loan provision ration) used by Masinde (2017) Muriithi1, Waweru and Muturi (2016) and Ramkrishna and Patil (2018). Masinde (2017) Muriithi1, Waweru and Muturi (2016) found NPL has a negative and significant impact. Ramkrishna and Patil (2018) disclose that NPL has a positive impact on the profitability of commercial banks.

Based on the literature review and aim of the study the following hypotheses are stated.

**Hypothesis 1:**

H0: Credit risk does not significantly influence ROA of Ethiopian private banks.

H1: Credit risk significantly influence ROA of Ethiopian private banks

### 1.5. Significance of the study

Understanding the effect of credit risk on the financial performance in the banking system is very vital. As it is observed, major reasons that forces banks to fail is inefficient knowledge about credit risk and their effect on the financial performance of commercial banks. As a result, the failure of a bank will adversely affect the country’s economy widely. Therefore, this study can be used as a reference for regulatory bodies and top management of private commercial banks regarding to the impact of credit risk on commercial banks profitability in order to evaluate the current non-performing loan impact and to reduce it if its impact is negative. It also can be as a reference for other researches.

## 1.6 Scope of the study

There are 16 private commercial banks which presently operating in Ethiopia. This study was based on selected fourteen privately owned commercial banks. The time coverage of the study was seven years from 2013 to 2019 because for most privately owned commercial banks data available starting from 2013 except Enat and Debub Global banks.

The dependent variable return on asset (ROA) was used as a proxy for performance indicator based on Ekinci and Poyraz (2019), Helms (2007), Muriu (2011) and Engdawork (2014). The independent variables were Loss Loan Provision to loans ratio (LLPR), Capital Adequacy ratio (CAR), Deposit to Total Asset ratio (DTAR), Bank size (TA), real Gross domestic product growth rate (RGDPgr) and inflation rate.

The sources of data for this research were from published audited annual financial reports of Ethiopian private banks and National Bank of Ethiopia annual reports. The time coverage will be from 2013 up to 2019.

## 1.7 Organization of the study

In this study chapter two various theories and empirical studies were overviewed and the studies are summarized with their methodologies, variables used, findings and conclusion. In addition theories about each dependent and independent variables are presented. Third chapter is the methodology part and includes the research design, nature of data used, sampling design; model specification, data processing analysing and presentation methods are presented. Moreover the model specification and the researcher expectation had described. Under chapter four the result of the regression finding was discussed. Finally, in chapter five the conclusion made based on the finding obtained in chapter four and also appropriate recommendations has given.

## 1.8 Limitation of the study

The first limitation of the study was that the government owned bank, Commercial Bank of Ethiopia is not considered in the study since the data was be outlier and will affect the estimation. Therefore, the findings of the study might fail to reflect on the overall banking industry of the country.

# CHAPTER TWO

# 2. LITERATURE REVIEW

## 2.1 Theoretical Literature

In this section the several theories was discussed. The theoretical discussions include concepts of credit risk, types of credit risk and determinants of financial sector performance.

### 2.1.1 Banking Risks

Risks are uncertainties resulting in adverse variations of profitability or in losses. In the banking universe, there are a large number of risks. Most are well known. However, there has been a significant extension of focus, from the traditional qualitative risk assessment towards the quantitative management of risks, due to both evolving risk practices and strong regulatory incentives. The different risks need careful definition to provide sound bases serving for quantitative measures of risk. As a result, risk definitions have gained precision over the years (Bessis, 2002)

Financial institutions such as banks that are run on the principle of avoiding all risks will be stagnant and will not adequately service the legitimate credit needs of the community. On the other hand, a bank that takes excessive risks is likely to run into difficulty. Banking risks can be defined and classified in many ways and it is possible to draw up a long list of the types of risks to which banks are exposed. In this section we will discuss eight main types of risks such as credit risk, interest rate risk, market risk, liquidity risk, off-balance-sheet risk, technology and operational risk, foreign exchange risk, and insolvency risk.

#### 2.1.1.1 Credit Risk

Credit risk is critical since the default of a small number of important customers can generate large losses, potentially leading to insolvency. Credit risk is the risk that counterparty will fail to perform fully its financial obligations. It includes the risk of default on a loan or bond obligation, as well as the risk of a guarantor or derivative counterparty failing to meet its obligations. This risk is present to some extent in all sectors although it is most important in banks because lending, where credit risk is crucial, remains their core activity and loans make up the bulk of their assets. Credit risk has long been identified as the dominant risk for banking firms and is an inherent part of their core lending business. Loans extended to customers and customer deposits generally represent, respectively, the most significant asset and liabilities classes of a bank’s balance sheet (Basel Committee on Banking Supervision, 2001).

Credit risk arises because of the possibility that promised cash flows on financial claims held by banks, such as loans or bonds, will not be paid in full. Virtually all types of banks face this risk. However, in general, banks that make loans or buy bonds with long maturities are more exposed than are banks that make loans or buy bonds with short maturities. This means, for example, that banks, thrifts, and life insurance companies are more exposed to credit risk than are money market mutual funds and property–casualty insurance companies. If the principal on all financial claims held by banks was paid in full on maturity and interest payments were made on the promised dates, banks would always receive back the original principal lent plus an interest return. That is, they would face no credit risk. If a borrower defaults, however, both the principal loaned and the interest payments expected to be received are at risk. As a result, many financial claims issued by corporations and held by banks promise a limited or fixed upside return (principal and interest payments to the lender) with a high probability and a large downside risk (loss of loan principal and promised interest) with a much smaller probability (Anthony Saunders, 2008).

Credit risk is the first of all risks in terms of importance. Default risk, a major source of loss, is the risk that customers default, meaning that they fail to comply with their obligations to service debt. Default triggers a total or partial loss of any amount lent to the counterparty. Credit risk is also the risk of a decline in the credit standing of an obligor of the issuer of a bond or stock. Such deterioration does not imply default, but it does imply that the probability of default increases. In the market universe, a deterioration of the credit standing of a borrower does materialize into a loss because it triggers an upward move of the required market yield to compensate the higher risk and triggers a value decline. ‘Issuer’ risk designates the obligors’ credit risk, to make it distinct from the specific risk of a particular issue, among several of the same issuer, depending on the nature of the instrument and its credit mitigates (seniority level and guarantees). The view of credit risk differs from the banking portfolio and the trading portfolio (Bessis, 2002).

Based on different literatures the major credit risk components are exposure, likelihood of default, or of a deterioration of the credit standing, and the recoveries under default. According to Bessis (2002), some major features of ratings systems are: ratings are ordinal or relative measures of risk rather than cardinal or absolute measures, such as default probability,external ratings are those of rating agencies, Moody’s, Standard & Poor’s (S&P) and Fitch, to name the global ones. They apply to debt issues rather than issuers because various debt issues from the same issuer have different risks depending on seniority level and guarantees, by contrast, an issuer’s rating characterizes only the default probability of the issuer, banks use internal rating scales because most of their borrowers do not have publicly rated debt issues and Internal rating scales of banks are customized to banks’ requirements, and usually characterize both borrower’s risk and facility’s risk.

There are various types of ratings. Ratings characterize sovereign risk, the risk of country debt and the risk of the local currency. Ratings are also either short-term or long-term. There are various types of country-related ratings: sovereign ratings of government sponsored borrowers; ratings of currencies; ratings of foreign currencies held locally; ratings of transfer risk, the risk of being unable to transfer cash out of the country. Furthermore, ratings apply only to individual debts of borrowers, and they do not address the bank’s portfolio risk, which benefits from diversification effects. Portfolio models show that portfolio risk varies across banks depending on the number of borrowers, the discrepancies in size between exposures and the extent of diversification among types of borrowers, industries and countries. The portfolio credit risk is critical in terms of potential losses and, therefore, for finding out how much capital is required to absorb such losses (Bessis, 2002).

#### 2.1.1.2 Interest Rate Risk

The interest rate risk is the risk of a decline in earnings due to the movements of interest rates. Most of the items of banks’ balance sheets generate revenues and costs that are interest rate-driven. Since interest rates are unstable, so are earnings. Anyone who lends or borrows is subject to interest rate risk. The lender earning a variable rate has the risk of seeing revenues reduced by a decline in interest rates. The borrower paying a variable rate bears higher costs when interest rates increase. Both positions are risky since they generate revenues or costs indexed to market rates. The other side of the coin is that interest rate exposure generates chances of gains as well. Interest rate risk relates to the exposure of banks’ profits to interest rate changes which affect assets and liabilities in different ways. Banks are exposed to interest rate risk because they operate with unmatched balance sheets. If bankers believe strongly that interest rates are going to move in a certain direction in the future, they have a strong incentive to position the bank accordingly: when an interest rate rise is expected, they will make assets more interest-sensitive relative to liabilities, and do the opposite when a fall is expected. Assets and liabilities can obviously be mixed to increase or decrease exposures, and techniques such as interest-margin variance analysis (IMVA) are used to evaluate current and project future exposures. As soon as a bank holds longer-term assets relative to liabilities, it potentially exposes itself to *refinancing risk*. This is the risk that the cost of rolling over or re-borrowing funds could be more than the return earned on asset investments. On the other hand, a bank is exposed to *reinvestment risk*; by holding shorter-term assets relative to liabilities, it faces uncertainty about the interest rate at which it could reinvest funds borrowed for a longer period (Anthony Saunders, 2008).

#### 2.1.1.3 Liquidity Risk

Another ever-present risk in banking sector is liquidity risk. It is the risk that a sudden surge in liability withdrawals may leave a bank in a position of having to liquidate assets in a very short period of time and at low prices. Customer demand for funds will require the sale or forced collection of assets at a loss. Banks require liquidity for four major reasons: as a cushion to replace net outflows of funds, in order to compensate for the non-receipt of expected inflows of funds, as a source of funds when contingent liabilities fall due and as a source of funds to undertake new transactions when desirable. Liquidity risk relates to the eventuality that banks cannot fulfil one or more of these needs. Banks must ensure that they have a satisfactory mix of various assets or liabilities to fulfil their liquidity needs. The choice among the variety of sources of liquidity should depend on several factors, including: purpose of liquidity needed, access to liquidity markets, management strategy, costs and characteristics of the various liquidity sources and interest rate forecasts (Bessis, 2002).

#### 2.1.1.4 Market Risk

Market risk is the risk incurred in the trading of assets and liabilities due to changes in interest rates, exchange rates, and other asset prices. Market risk arises when banks actively trade assets and liabilities (and derivatives) rather than hold them for longer-term investment, funding, or hedging purposes. Market risk is closely related to interest rate, equity return, and foreign exchange risk in that as these risks increase or decrease, the overall risk of the bank is affected. However, market risk adds another dimension resulting from its trading activity. Market risk is the incremental risk incurred by bank when interest rate, foreign exchange, and equity return risks are combined with an active trading strategy, especially one that involves short trading horizons such as a day. Conceptually, bank’s trading portfolio can be differentiated from its investment portfolio on the basis of time horizon and secondary market liquidity. The trading portfolio contains assets, liabilities, and derivative contracts that can be quickly bought or sold on organized financial markets. The investment portfolio (or in the case of banks, the so-called banking book) contains assets and liabilities that are relatively illiquid and held for longer holding periods (Anthony Saunders, 2008).

#### 2.1.1.5 Operational Risk

Operational risks are those of malfunctions of the information system, reporting systems, internal risk-monitoring rules and internal procedures designed to take timely corrective actions, or the compliance with internal risk policy rules. The New Basel Accord of 2001 defines operational risk as the risk of direct or indirect loss resulting from inadequate or failed internal processes, people and systems or from external events’. In the absence of efficient tracking and reporting of risks, some important risks remain ignored, do not trigger any corrective action and can result in disastrous consequences. In essence, operational risk is an ‘event risk.

#### 2.1.1.6 Insolvency Risk

Solvency risk is the risk of being unable to absorb losses, generated by all types of risks, with the available capital. It differs from bankruptcy risk resulting from defaulting on debt obligations and inability to raise funds for meeting such obligations. Solvency risk is equivalent to the default risk of the bank. Solvency is a joint outcome of available capital and of all risks. The basic principle of ‘capital adequacy’, promoted by regulators, is to define what level of capital allows a bank to sustain the potential losses arising from all current risks and complying with an acceptable solvency level. The capital adequacy principle follows the major orientations of risk management. The implementation of this principle requires: Valuing all risks to make them comparable to the capital base of a bank and adjusting capital to a level matching the valuation of risks, which implies defining a ‘tolerance’ level for the risk that losses exceed this amount, a risk that should remain very low to be acceptable. Meeting these specifications drives the regulators’ philosophy and prudent rules. The Value at Risk (VaR) concept addresses these issues directly by providing potential loss values for various confidence levels, probability that actual losses exceed an upper bound (Bessis, 2002).

### 2.1.2 Credit Risk Management

Since exposure to credit risk continues to be the leading source of problems in banks world-wide, banks and central banks should be able to draw useful lessons from past experiences. The ultimate goal of risk management is to facilitate a consistent implementation of both risks and business policies. Classical risk practices consist of setting risk limits while ensuring that business remains profitable. Modern best practices consist of setting risk limits based on economic measures of risk while ensuring the best risk-adjusted performances. In both cases, the goal remains to enhance the risk–return profile of transactions and of the bank’s portfolios. Nevertheless, new best practices are more ‘risk-sensitive’ through quantification of risks. Risk management combines top-down and bottom-up processes with ‘horizontal’ processes. The top-down and bottom-up views relate to the vertical dimension of management, from general management to individual transactions, and vice versa. The horizontal layers refer to individual transactions, business lines, product lines and market segments, in addition to the overall global level. They require moving back and forth from a risk–return view of the bank to a business view, whose main dimensions are the product families and the market segments (Bessis, 2002).

#### 2.1.2.1 Principles for the Management of Credit Risk

The Basel Committee for Banking Supervision has done a lot of work on measures to manage credit risk. According to Basel Committee on Banking Supervision (2000) principles for the management of credit risk are categorized under four major groups; establishing an appropriate credit risk environment, operating under a sound credit granting process, maintaining an appropriate credit administration, measurement and monitoring process and ensuring adequate controls over credit risk.

**A. Establishing an appropriate credit risk environment**

Principle 1: The board of directors should have responsibility for approving and periodically (at least annually) reviewing the credit risk strategy and significant credit risk policies of the bank. The strategy should reflect the bank’s tolerance for risk and the level of profitability the bank expects to achieve for incurring various credit risks.

Principle 2: Senior management should have responsibility for implementing the credit risk strategy approved by the board of directors and for developing policies and procedures for identifying, measuring, monitoring and controlling credit risk. Such policies and procedures should address credit risk in all of the bank’s activities and at both the individual credit and portfolio levels.

Principle 3: Banks should identify and manage credit risk inherent in all products and activities. Banks should ensure that the risks of products and activities new to them are subject to adequate risk management procedures and controls before being introduced or undertaken, and approved in advance by the board of directors or its appropriate committee.

**B. Operating under a sound credit granting process**

Principle 4: Banks must operate within sound, well-defined credit-granting criteria.

These criteria should include a clear indication of the bank’s target market and thorough understanding of the borrower or counterparty, as well as the purpose and structure of the credit, and its source of repayment.

Principle 5: Banks should establish overall credit limits at the level of individual borrowers and counterparties, and groups of connected counterparties that aggregate incomparable and meaningful manner different types of exposures, both in the banking and trading book and on and off the balance sheet.

Principle 6: Banks should have a clearly-established process in place for approving new credits as well as the amendment, renewal and re-financing of existing credits.

Principle 7: All extensions of credit must be made on an arm’s-length basis. In particular, credits to related companies and individuals must be authorized on an exception basis, monitored with particular care and other appropriate steps taken to control or mitigate the risks of non-arm’s length lending.

**C. Maintaining an appropriate credit administration, measurement and monitoring process**

Principle 8: Banks should have in place a system for the ongoing administration of their various credit risk-bearing portfolios.

Principle 9: Banks must have in place a system for monitoring the condition of individual credits, including determining the adequacy of provisions and reserves.

Principle 10: Banks are encouraged to develop and utilize an internal risk rating system in managing credit risk. The rating system should be consistent with the nature, size and complexity of a bank’s activities.

Principle 11: Banks must have information systems and analytical techniques that enable management to measure the credit risk inherent in all on- and off-balance sheet activities. The management information system should provide adequate information on the composition of the credit portfolio, including identification of any concentrations of risk.

Principle 12: Banks must have in place a system for monitoring the overall composition and quality of the credit portfolio.

Principle 13: Banks should take into consideration potential future changes in economic conditions when assessing individual credits and their credit portfolios, and should assess their credit risk exposures under stressful conditions.

**D. Ensuring adequate controls over credit risk**

Principle 14: Banks must establish a system of independent, ongoing assessment of the bank’s credit risk management processes and the results of such reviews should be communicated directly to the board of directors and senior management.

Principle 15: Banks must ensure that the credit-granting function is being properly managed and that credit exposures are within levels consistent with prudential standards and internal limits. Banks should establish and enforce internal controls and other practices to ensure that exceptions to policies, procedures and limits are reported in a timely manner to the appropriate level of management for action.

Principle 16: Banks must have a system in place for early remedial action on deteriorating credits, managing problem credits and similar workout situations.

## 2.2 Empirical Literatures

Isah (2018) examine the impact of credit risk management systems on the financial performance of commercial banks in Uganda. The paper was set to analyze the impact of credit risk management on the financial performance of commercial banks in Uganda for a period of 2006 – 2015 using panel data for a sample of 20 commercial banks. The study employs return on assets as a dependent variable and non‑performing loans, growth in interest earnings and loan loss provisions to total loans as credit risk measures. Secondary data is sourced from the Bank scope database, African development bank and the central bank of Uganda. The study employs descriptive statistics, regressions and correlation analysis. Regression models are to estimate the magnitude of significance of credit risk management on the performance of commercial banks in Uganda. The study revealed that credit risk management impacts on the performance of Ugandan commercial banks. The results portrayed that banks’ performance was inversely influenced by non‑performing loans which may expose them to large magnitudes of illiquidity and financial crisis.

Ekinci and Poyraz (2019) examined the effect of credit risk on financial performance of banks in Turkey. Three panels’ data were considered respectively state-owned banks, privately-owned banks and foreign banks in order to compare banks according to their ownership structure. Return on Asset (ROA) and Return on Equity (ROE) were used as proxies for financial performance indicators while Non-Performing Loans (NPLs) was used as credit risk indicators. The estimation results showed that there is a negative relationship between credit risk and ROA as well as between credit risk and ROE. This result suggests that there is a relationship between credit risk management and profitability of Turkish banks from the period of 2005 to 2017.

Poudel (2012) try to assess the impact of credit risk management on financial performance of commercial banks in Nepal. The researcher explore various parameters pertinent to credit risk management as it affect banks’ financial performance. Such parameters covered in the study were; default rate, cost per loan assets and capital adequacy ratio. Financial report of 31 banks were used to analyze for eleven years (2001-2011) comparing the profitability ratio to default rate, cost of per loan assets and capital adequacy ratio which was presented in descriptive, correlation and regression was used to analyze the data. The study revealed that all these parameters have an inverse impact on banks’ financial performance; however, the default rate is the most predictor of bank financial performance.

Parab and Patil (2018) conduct the study mainly concerned with credit risk and public and private banks’ performance in India and uses panel data of 40 commercial banks, comprising of 24 public and 16 private banks which were listed on Bombay Stock Exchange during the study period. The study employs various credit risk ratios as independent variables and three performance indicators as dependent variables for a period of 16 years from 2000-01 to 2015-16. The proxy for credit risk used in the study include Gross Non Performing Asset ratio, Loan Loss Allowance to Total Advances, Capital Adequacy Ratio, Credit Deposit Ratio, Loan Loss Allowance to Non-Performing Assets, Loan Loss Allowance to Assets, and Advances to Assets. Deposits and Size have been used as control variables. Return on Assets, Return on Equity and Net Interest Margin have been used as proxy for performance. The result of the Random Effect Model shows that there is positive and significant relationship between Loan Loss Allowance and all the three performance indicators used in the study. Credit Deposit ratio is also significant at varying level and positively influences all the three performance indicators. Loan loss Allowance to Non-Performing Asset is significant and inversely influences all three performance indicators.

According to Helms (2007) and Muriu (2011), deposits are viewed as cheaper alternatives to funding and as such deposits are deemed to bring down the cost of operations in the process increasing profitability. A proportionally larger deposit base as a percentage of total assets will typically lead to an overall lower cost of funds, assuming that the deposits program is cost efficient in its operational and financial expense of deposits ratios. Helms (2007) and Muriu (2011) found a positive significant relationship between deposits to assets ratio and banks sustainability.

In case of Ethiopia there are several studies conducted related to credit risk and commercial banks performance. The researcher tried to assess some of the studies in this literature. Tegegne (2018) empirically examines the impact of credit risk on profitability of private commercial banks in Ethiopia and secondary data source which ranges from 2003 to 2016. The variables used in his model specification include bank specific variables and macro-economic factors that affect banks financial performance. Return on Equity (ROE) was used as a proxy for financial performance or explained variable and nonperforming loan ratio as proxy for credit risk, inflation, CAR and GDP as macro-economic factor which used as independent variable. To accomplish the study he uses panel regression model for six banks from a total sixteen. The result indicates that Nonperforming loan ratio; cost per loan asset ratio and capital adequacy ratio had a negative and significant impact on banks’ profitability. In addition, loan to deposit ratio and GDP have a affirmative significant impact on banks profitability. In general, bank specific factors and macroeconomic factor GDP have significant impact on banks profitability while external factors (i.e. inflation and interest rate spread) had no significant impact on banks profitability.

Misker(2015) had explore the impact of credit risk on Ethiopia Banks profitability. He includes bank specific, Industry specific and macro-economic factors that affect banks financial performance. He used a secondary data for eight banks and ROE was dependent variable while nonperforming loan, CAR, bank size, loan and advance to deposit ratio, inflation and GDP have taken as an independent variables. The finding shows that nonperforming loan ratio and CAR had a significant negative impact on banks financial performance. Loan to deposit ratio and bank size have a positive and significant impact on banks profitability. The other factor interest rate spread has negative insignificant impact commercial banks profitability. GDP and Inflation had no significant impact on banks profitability.

Muriithi et al. (2016) assessed the effect of credit risk on financial performance of commercial banks in Kenya. The study covered the period between year 2005 and 2014. Credit risk was measured by measured by capital to risk weighted assets, asset quality, loan loss provision, loan and advance ratios and financial performance by return on equity (ROE). The study used the balance sheets components and financial ratios for 43 commercial banks in Kenya registered by year 2014. Panel data techniques of fixed effects estimation and generalized method of moments (GMM) were used to purge time–invariant unobserved firm specific effects and to mitigate potential endogeneity problems. The pairwise correlations between the variables were carried out. From the results credit risk has a negative and significant relationship with bank profitability. Poor asset quality or high non-performing loans to total asset is related to poor bank performance both in short run and long run.

Engdawork (2014) empirically examine the quantitative effect of credit risk on the performance of commercial banks in Ethiopia, considering variables related to lending activities, over the period of 5 years (2008-2012). The empirical investigation uses the accounting measure of Return on Assets (ROA), which is the dependent variable, to represent Banks’ performance. The study finds that the selected variables: the provision to total loans, loan to total asset, credit administration (cost to total loans) and Size (Economies of scale) have significant effect on the performance of Banks. However, a certain variation in the magnitude and direction of their effect on the selected profitability measure, Return on Asset.

Bruke (2018) try to analyze the impact of credit risk management on the financial performance of selected commercial banks and to establish if there exists any relationship between the credit risk management determinants of CAMEL indicators and financial performance (measured by return on equity) of commercial banks in Ethiopia. The study found that there is a strong relationship between the CAMEL components and financial performance of commercial banks. The study also found that capital adequacy, asset quality and liquidity had weak relationship with financial performance (ROE) while management efficiency had moderate relationships with financial performance. Earnings had a strong relationship with financial performance.

Currently most of the research done which includes Engdawork (2014) and Bruke (2018) on the impact of credit risk on Ethiopian commercial banks based on CAMEL model are on both private and public banks and there is research gap specifically done on private banks of Ethiopia. Therefore this study helps that CAMEL model can be used as a representation for credit risk management and as proxy to measure its impact on financial performances of Ethiopian private commercial banks in Ethiopia.

## 2.3 Summary of Empirical Literature Review

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **No.** | **Title** | **Authors (Year)** | **Country** | **Sample Period** | **Methodology** | **Findings** |
| **1** | Credit Risk and Public and Private Banks’ Performance. | Ramkrishna and Patil (2018) | India |  2001-2016 | A Panel Approach | There was positive and significant relationship between Loan Loss Allowance and all the performance indicators used in the study. |
| **2** | Effect of credit risk on financial performance of commercial bank in Kenya | Masinde (2017) | Kenya | 2012-2016 | Multiple Regression | There exist an inverse relationship between financial performance and loss of the loan. |
| **3** | Effect of Credit Risk on Financial Performance of CommercialBanks  | Muriithi1, Waweru and Muturi (2016) | Kenya | 2005-2014 | Panel Approach and generalized method of moments (GMM) | Credit risk has a negative and significant relationship withBank profitability. |
| **4** | Impact of credit risk management systems on the financial performance of commercial banks  | IsahSerwadda(2018) | Uganda | 2006-2015 | A Panel Approach | The results portrayed that banks’ performance was inversely influenced by non‑performing loans which may expose them to large magnitudes of illiquidity and financial crisis. |
| **5** | Impact of credit risk on the performance of commercial banks  | Engdawork (2014) | Ethiopia | 2008-2012 | Multiple Regression | The provision to total loans, loan to total asset, credit administration and Size have significant effect on the performance of Banks. |
| **6** | The effect of credit risk management on banks’ financial performance  | Bruke (2018) | Ethiopia | 2012-2016 | Multiple Regression | There was a strong relationship between the CAMEL components and financial performance of commercial Banks. |
| **7** | The Effect of Credit Risk on the Banking Profitability | Hanifa, Pervin, Chowdhury&Banna (2015) | Bangladesh | 2003-2013 | A Panel Approach | The study finds a robust negative and significant effect of NPLGL, LLRGL on all profitability indicators. The analysis also finds a negative and significant effect of CAR on ROAE. |
| **8** | The impact of credit risk management on financial performance of commercial banks | Sharma Poudel (2012) | Nepal | 2001-2011 | Multiple Regression | The study revealed that all these parameters have an inverse impact on banks’ financial performance. |

##

## 2.3 Conceptual Frame Model of the Research

According to a study and insights gained from the literature review, return on asset is affected by two set of factors; namely bank specific and macroeconomic factors.

Bank specific factors include in this study based on the literature review is loss loan provision to loans ratio (Ramkrishna and Patil, 2018, Engdawork, 2014, Misker, 2015, Tegegne, 2018)

) which is used as a credit risk indicator, macroeconomic factors include gross domestic product and inflation rate, bank size which is proxy by total asset and other control variables includes Deposit to Total Asset ratio (DTAR) and Capital Adequacy ratio (Hanifa, Pervin, Chowdhury &Banna, 2015))

In this research, based on the objective of the study bank specific and macroeconomic factors captured and the following conceptual model are depicted as follow:

***Dependent Variables***

***Independent Variables***

***Credit Risk Indicator***

* *Loss Loan Provision to loans ratio (LLPR*)

***Bank Specific Factors***

***Macroeconomic Factors***

* Gross Domestic Product (GDP)
* Inflation rate (INF)

***Bank’s Financial Performance Indicator Indicator***

***Return on Asset (ROA)***

* *Capital Adequacy ratio (𝐶AR )*
* *Deposit to Total Asset ratio (DTAR)*
* *Total Asset (Bank size) (TA)*

***Control Variables***

Figure 1*: Conceptual frame work based on literature review*

#

# CHAPTER THREE

# 3. RESEARCH METHODOLOGY

## 3.1 Research Design and Approach

In order to investigate the effect of credit risk on financial performance of Ethiopian private banks’, it is necessary to select the most appropriate research approach. Therefore, the researcher had employed both descriptive and causal research approach. From the descriptive analysis part average, percentage and graph are applied. Meanwhile, causal analysis include a panel regression.

## 3.2 Target population

The study give more emphasis on credit risk and its effect on performance of private commercial banks in Ethiopia on purposively selected companies. There are 16 private commercial banks which presently operating in Ethiopia. This study was based on selected fourteen privately owned commercial banks which does not include Debub Global and Enat banks, data for the two private banks are not fully available due to they are at infant stage.

## 3.3 Data source and Variables

There is no single variable that indicates the level of credit risk being considered as a proxy for performance indicator. Different authors used different measures of credit risk and performance. For example it is difficult to get data related to NPL from most commercial banks and the regulatory body due to confidentiality. Therefore, the choice of the variables for credit risk greatly depends on the availability of data related to financial performances of banks.

Banks profitability is influenced by many factors which may be industry specific, bank specific or macroeconomic factors. In this research the researcher identified the determinants of commercial banks profitability. The dependent variable return on asset (ROA) was used as a proxy for performance indicator based on Ekinci and Poyraz (2019), Parab and Patil (2018), Helms (2007), Muriu (2011) and Engdawork (2014).

The independent variables were identified based on empirical review of Ramakrishna(2018), Masinde(2017), Engidawork(2014) and Bruke(2018) these were Loss Loan Provision to loans ratio (LLPR), Capital Adequacy ratio (CAR), Deposit to Total Asset ratio (DTAR), Bank size (TA), real Gross domestic product growth rate (RGDPgr) and inflation rate.

The sources of data for this research were from published audited annual financial reports of Ethiopian private banks and National Bank of Ethiopia annual reports. The time coverage will be from 2013 up to 2019.

## 3.4 Model specification

In order to achieve objectives of the research, a Panel regression model was used. Therefore a panel data model was take in to consideration in computation of the parameters of the study. The general function of the model written as follows;

Profit (ROA) = *f (credit risk, credit risk factors, other control factors)*



Where:

*ROAit*= Return on Asset of bank i at time t

*LLPRit*= Loss Loan provision to total Loan ratio of the bank i at time t

*CARit*= Capital Adequacy Ratio of bank i at time t

*DTARit*= Deposit to Total Asset ratio of bank i at time t

*lnTAit*= Natural log of Total Asset of Bank i at time t

*RGDPgrt*= Real Gross Domestic Product growth rate at time t

*INF*t= Inflation rate at time t

Where *t* = 2013 – 2019,

*i =* private commercial banks in Ethiopia

𝛽0 = constant for each banks

𝛽1, 𝛽2, 𝛽3, …… 𝛽6 coefficients of the independent variable

εit = within entity error

## 3.5. Method of Data Analysis

The researcher analysed the data collected from secondary sources by using regression and correlation analysis method. By clearly identifying the dependent and the independent variables, the researcher used panel regression model to show the relationship between the dependent and independent variables. To select the specific panel model hausman test was conducted and based on that fixed effect model was appropriate to analyse the impact of credit risk on private banks profitability. To analyse those secondary data EViews 8 was used and the output were interpreted using tabular, graphical and charts.

### 3.6. Model Diagnostics Test

In this paper all the necessary model diagnostics was conducted. The overall significances of the regression coefficients (F-test), normality test and autocorrelation (Durbin Watson test) was employed.

**Normality Test:** to test the Classical Linear Regression Model (CLRM) assumption of the error term is normally distributed with the mean of error being zero as positive error will offset the negative error. In null hypothesis, the assumption was the error term is normally distributed tested using joint test of skewness and kurtosis which is Jarue-Bera test.

**Autocorrelation:** Autocorrelation problem will occur when error term at the period t is correlated with the error term at period before t. Autocorrelation is most likely to happen in the time series data due to the importance of the sequence of the time period. To test the existence of autocorrelation or serial correlation in fixed effect model Deribn Watson (DW) test was used and if DW value is close to two it indicates there is no autocorrelation else there is an autocorrelation.

**Multicollinearity**: Multicollinearity (also collinearity) is a phenomenon in which two or more predictor variables in a multiple regression model are highly correlated. By examining the correlation matrix greater or equal to 0.7 indicates the existence of multi-collinerity between variables else doesn’t exist.

# CHAPTER FOUR

# 4. DATA ANALYSIS AND INTERPRETATION

In presenting findings and interpretation of the data, this chapter is organized in a way to meet the broad research objective and to answer the research questions. In this chapter the data collected were presented and important correlation and regression analysis findings were discussed

## 4.1. Descriptive Statistics

The descriptive statistics for the dependent and independent variables for mean, median, standard deviation, minimum and maximum values and number of observation are presented below. The explained variable is financial performance measured by Return on Asset parameter and others are the explanatory variables. They are: Loss Loan provision to total Loan ratio of the bank, Capital Adequacy of bank, Deposit to Total Asset ratio of bank, Natural log of Total Asset of Bank, real Gross Domestic Product rate and inflation rate. To show the brief overview of the data, the result of descriptive statistics for both dependent and independent variables are presented as follows on table 4.1.1 of variables of private commercial banks that operate in Ethiopia from 2013 to 2019.

Table 4. 1.1: Descriptive Statistics of Dependent and Independent Variables

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **ROA** | **RGDPGR** | **LNTA** | **LLPR** | **INF** | **DTAR** | **CAR** |
|  **Mean** | 3.901 | 9.992 | 9.046 | 2.016 | 11.393 | 73.889 | 15.419 |
|  **Median** | 3.785 | 10.148 | 9.236 | 1.765 | 8.464 | 75.223 | 15.766 |
|  **Maximum** | 6.839 | 11.358 | 10.920 | 4.500 | 20.812 | 86.348 | 38.274 |
|  **Minimum** | 2.026 | 7.705 | 6.051 | 0.979 | 7.390 | 7.027 | 0.151 |
|  **Std. Dev.** | 0.970 | 1.959 | 0.971 | 0.796 | 4.917 | 8.885 | 6.249 |
|  **Skewness** | 0.578 | 0.971 | -0.588 | 1.127 | 0.994 | -4.600 | -0.032 |
|  **Kurtosis** | 3.108 | 3.243 | 2.977 | 3.839 | 2.334 | 34.260 | 5.607 |
|  **Observations** | 98 | 98 | 98 | 98 | 98 | 98 | 98 |

Source: The Researcher computation through Eviews 8

From above table 4.1.1 return on asset is an indicator of how efficient a bank has a mean value of 3.9% which means private banks earn on average 3.9 percent for their asset. The average value of return on asset 3.9 percent indicates that on average private commercial banks in Ethiopia are profitable based on international guideline because it is greater than one percent which is supported by Lukosiunas R. (2017) who states banks whose return on asset greater than one percent is doing pretty good. Return on asset ranges from 2.02 percent minimum value to 6.8 percent of maximum value and it has standard deviation from mean of 0.97 percent.

The mean value or average percentage of Loss Loan Provision Ratio during the seven years was 2.02% which indicates the average amount of loan provision ratio held by private commercial banks. On private banks the minimum and maximum loan provision held by banks are 0.98 percent and 4.5 percent respectively with standard deviation 0.79 percent.

Capital adequacy ratio (CAR) which is a control variable under study have an average value of 15.4 percent with a minimum and maximum of 0.158 percent and 38.27 percent respectively. The standard deviation for CAR was 6.25 percent which shows the existence of relatively high variation in capital adequacy ratio among the private commercial banks with in the given time periods. The average value of CAR 15.8 indicates that private commercial banks doing well because it is above the Basel III norms stipulated a capital to risk weighted assets of 8%.

The macroeconomic indicators variable real GDP growth rate and inflation rate have an average value of 10 percent and 11.39 percent respectively. GDP growth rate and inflation rate have standard deviation value of 1.96 percent and 4.9 percent respectively for the given time periods which shows that there is less variability in real gross domestic product. The real gross domestic growth rate has a maximum and minimum growth rate of 11.3 and 7.7 percent respectively for the given time period. The inflation rate has a maximum and minimum growth rate of 20.8 and 7.4 percent respectively for the given time period from 2013 to 2019.

Deposit to total assets ratio which is a control variable under study have an average value of 73.9 percent with a minimum and maximum of 7.02 percent and 86.4 percent respectively. The average value indicates that banks are in good position to get low cost financial source. The standard deviation for Deposit to total assets ratio was 8.88 percent which shows the existence of relatively moderate variation in Deposit to total assets ratio among the private commercial banks with in the given time periods.

Bank Size which is measured by total asset the antilog value of the above table result has a mean value 8,484.53 million birr which is the antilog of 9.05 above with the standard deviation of 2.64 with the maximum and minimum values of 54176.4 million and 424.11million birr respectively.

## 4.2. Correlation Analysis

Correlation measures the degree of linear association between two variables which ranges from -1 (perfect negative correlation) to +1(perfect positive correlation). A correlation coefficient of zero, on the other hand, indicates the absence of relationship (association) between two variables. The table 4.2.1 below shows the correlation matrix among dependent and independent variables.

Table 4.2.1: Correlation matrix among dependent and independent variables

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|   | ROA | RGDPGR | LNTA | LLPR | INF | DTAR | CAR |
| ROA | 1.000 | 0.183 | -0.095 | -0.302 | 0.124 | 0.009 | 0.085 |
| RGDPGR | 0.183 | 1.000 | -0.508 | 0.321 | -0.235 | -0.260 | 0.466 |
| LNTA | -0.095 | -0.508 | 1.000 | 0.064 | -0.094 | 0.248 | -0.416 |
| LLPR | -0.302 | 0.321 | 0.064 | 1.000 | -0.102 | 0.015 | 0.153 |
| INF | 0.124 | -0.235 | -0.094 | -0.102 | 1.000 | -0.008 | 0.062 |
| DTAR | 0.009 | -0.260 | 0.248 | 0.015 | -0.008 | 1.000 | -0.312 |
| CAR | 0.085 | 0.466 | -0.416 | 0.153 | 0.062 | -0.312 | 1.000 |

Source: The Researcher computation through Eviews 8

As shown from above table 4.2.1 shows that ROA negatively correlated to LLPR and LNTA while it positively correlated with INF, DTAR, CAR and RGDPGR. Loan loss provision ratio has relatively high correlation with ROA as compared to others and its impact is negative on return on asset. The negative relationship between loan loose provision ratio and return on asset shows that when banks loan loose provision ration increases their profitability affected negatively which indicates that bank managers better care about their credit risk. Next to loan loss ratio real GDP growth rate and inflation rate have highly correlated with ROA. The positive relationship between real gross domestic product growth rate and return on asset shows that when the economy is booming or doing well those investors expect positive return and borrow at high interest rate and this positively affects the profitability of commercial banks. The other important variable is capital adequacy ratio which has positive relationship with return on asset which indicates that when banks capital strength increase they will have the capacity to finance even risky projects at high interest rate and it positively affects the profitability of commercial banks.

**4.3. Testing Classical Linear Regression Model (CLRM) assumptions**

The regression model assumes the linearity of the parameter since the model applies linear ordinary least square (OLS). The main objective of the model is to predict the strength as well as direction of association among the dependent and independent variables. Accordingly, in order to maintain the validity and robustness of the regression result of the research in CLRM, it is better to satisfy basic assumption of CLRM. Therefore, before using the model for testing the significance of the slopes and analyzing the regressed result, normality, multicolinearity and autocorrelation tests are checked for identifying misspecification of data if any so as to fulfill research quality.

### 4.3.1. Normality Test

The first important diagnostic test conducted in this research is the normality assumption which states that the error terms are normally distributed. To check this normality assumption, the most commonly applied tests is the Jarque-Bera (JB) test and the null hypothesis to be tested is errors normally distributed vs the alternative not normally distributed.

Figure 4.3.1: Normality test



Source: The Researcher computation through Eviews 8

As shown in the above histogram the probability of Jarque-Bera test 0.74 shows it is greater than five percent which is insignificant to reject the null hypothesis, which states that the error term is normally distributed. Therefore the model passes normality assumption.

### 4.3.2. Autocorrelation Test

According to Chris brooks (2008), assumption three said that the CLRM‟s disturbance terms are the covariance between the error terms over time is zero. In other words, it is assumed that the errors are uncorrelated with one another. In addition he said that if the errors are not uncorrelated with one another, it would be stated that they are “auto correlated” or that they are “serially correlated”. To test this assumption the Durbin–Watson (DW) test for first order autocorrelation statistical test was applied. The value of Durbin Watson (DW) test for first order autocorrelation close to two it shows there is no autocorrelation else there is autocorrelation. The Durbin-Watson test statistic value from fixed effect regression table 4.5.1 shows that it is 1.98 which is approximately close to two it indicates that there is no first order autocorrelation therefore the model satisfies the assumption of there is no autocorrelation.

### 4.3.5. Multicolinearity Test

Multicolinearity test is conducted to identify the correlation between explanatory variables and to avoid double effect of independent variable from the model. To test multicolinearity test correlation analysis was considered and if the value of correlation coefficient is less than 70 percent it indicates there is no multicolinearity or the correlation between independent variables is not strong. Therefore based on the correlation matrix from table 2 we can say there is no multicolinearity problem because all correlation coefficient is less than 70 percent.

## 4.4. Random Effect (RE) versus Fixed Effect (FE) models

To test the relationship between these private commercial banks profitability (ROA) and identified profitability determinants an important issue is determining fixed effects or random effects model is appropriate. So the focal point the researcher concern here is, to examine whether individual effects are fixed or random. According to Gujarati (2004), if T (the number of time series data) is large and N (the number of cross-sectional units) is small, there is likely to be little difference in the values of the parameters estimated by fixed effect model (FEM) and random effect model (REM). However the choice between two here is very important to identify the fitted model. The best way to test weather fixed effect or random effect model is suitable is using hausman test. The null hypothesis of Hausman Test is use Random effect model that means if the null hypothesis is rejected Fixed Effect model is appropriate for the study.

Table 4.4.1: Hausman Test

|  |
| --- |
| Correlated Random Effects - Hausman Test |
| Equation: Untitled |  |  |
| Test cross-section random effects |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Test Summary | Chi-Sq. Statistic | Chi-Sq. d.f. | Prob.  |
|  |  |  |  |  |
|  |  |  |  |  |
| Cross-section random | 12.643107 | 6 | 0.0491 |
|  |  |  |  |  |
|  |  |  |  |  |

Source: The Researcher computation through Eviews 8

As shown from the Hausman specification test for this study has a p-value of 0.0491 for the regression model. This indicates that p-value is significant at 5% and then the null hypothesis is rejected and the alternate hypothesis i.e. fixed effect model is appropriate for the given data set in this study.

## 4.5. Multiple Regression Analysis

The entire regression result was made and coefficients of the variables were estimated by EView software version 8.As stated earlier in this study fixed Effect regression model was which is selected as an appropriate model based on Hausman test. Thus, the fixed effect model used to examine the impact of credit risk on profitability of private commercial banks in Ethiopia:

Table 4.5.1: Fixed Effect model regression output

|  |  |  |
| --- | --- | --- |
| Dependent Variable: ROA |  |  |
| Method: P anel Least Squares |  |
| Date: 05/22/20 Time: 15:29 |  |
| Sample: 2013 2019 |  |  |
| Periods included: 7 |  |  |
| Cross-sections included: 14 |  |
| Total panel (balanced) observations: 98 |  |
| Cross-section SUR (PCSE) standard errors & covariance (no d.f. |
|         correction) |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob.   |
|  |  |  |  |  |
|  |  |  |  |  |
| RGDPGR | 0.191680 | 0.101597 | 1.886665 | 0.0629 |
| LNTA | -0.104006 | 0.147987 | -0.702805 | 0.4843 |
| LLPR | -0.215665 | 0.098909 | -2.180437 | 0.0322 |
| INF | 0.031356 | 0.015956 | 1.965115 | 0.0530 |
| DTAR | 0.019898 | 0.007651 | 2.600537 | 0.0111 |
| CAR | 0.075597 | 0.032739 | 2.309104 | 0.0236 |
| C | 0.367719 | 2.420038 | 0.151948 | 0.8796 |
|  |  |  |  |  |
|  |  |  |  |  |
|  | Effects Specification |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Cross-section fixed (dummy variables) |  |
|  |  |  |  |  |
|  |  |  |  |  |
| R-squared | 0.745591 |     Mean dependent var | 3.900579 |
| Adjusted R-squared | 0.634902 |     S.D. dependent var | 0.970311 |
| S.E. of regression | 0.729412 |     Akaike info criterion | 2.386748 |
| Sum squared resid | 41.49925 |     Schwarz criterion | 2.914293 |
| Log likelihood | -96.95066 |     Hannan-Quinn criter. | 2.600129 |
| F-statistic | 4.929037 |     Durbin-Watson stat | 1.980254 |
| Prob(F-statistic) | 0.000000 |  |  |  |

Source: The Researcher computation through Eviews 8

The above regression result shows the bank’s profitability which is measured by ROA as dependent variable and the independent variables loan loss provision ratio, logarithm of total asset, capital adequacy ratio, real GDP growth rate, inflation rate and deposit to total asset ratio.

From the above estimation result R-squared statistics and the adjusted-R squared statistics of model was 74% and it shows the 74 percent of the model is well explained by the independent variables. Since the p-values of the F-test from the model is less than five percent it is significant to reject the hypothesis of all of the slope parameters (βs‟) are jointly zero at one percent level of significance.

Based on the result obtained in the regression table 4.5.1 credit risk which is proxy by loan loss provision ratio has a negative and significant impact on the performance of the bank(ROA). The probability of 0.03 enables the researcher to reject the null hypothesis of no significant impact on profitability and accept the alternate hypothesis. The coefficient of loan loose provision ratio -0.215 indicates that when the loan loose ratio increases by one percent, banks profitability (ROA) decreases by 0.215 percent. This finding goes in line with the literatures Masinde (2017) and Engidawork (2018) who found a negative relationship between credit risk (loan loose provision ratio) and performance of commercial banks (ROA). The reason for negative relationship between commercial banks profitability and credit risk is that if commercial banks face default of credit, banks to have high loan loose provision ratio to finance this credit default and high level loan loose provision ratio which decreases their interest income which will be generated by lending that money to the borrowers.

Based on the fixed effect regression model result presented in table 4.5.1, capital adequacy ratio has the positive and statistically significant impact at five percent level of significance on ROA that determines the risk taking behavior of banks. The coefficient 0.075 indicates that a one percent increase of CAR increases private banks profitability by approximately0.08 percent. This result also reveals what Parab amd Patil (2018) and Bruke (2018) who had found that there is a positive relationship between CAR and return on asset. The positive impact of capital adequacy ratio on commercial banks profitability indicates that well-capitalized banks face lower costs of going bankrupt which reduces their costs of funding and risks which in turn increases their profitability.

A multiple regression result from above table shows that real GDP growth rate had statistically significant impact on ROA at ten percent level of significance. The coefficient sign for real GDP growth rate was also positive which indicates that the change in real GDP growth rate to the bank profitability is positive and has significant impact. The coefficient 0.17 indicates that a one percent increase of GDP growth rate increases private banks profitability (ROA) by approximately 0.17 percent. The positive impact of real GDP growth rate on bank performance shows that if the economy performs well then demand for funds increase and also paying ability of borrowers increase therefore on both dimensions it increases revenue that can banks generate and finally it positively affects financial performance.

Inflation is one of the macroeconomic factors which have positive and statistically significant impact on financial performance at ten percent level of significance and this shows banks are capable to anticipate future price. The coefficient 0.03 shows that when inflation increases by one percent banks profitability increases by 0.03 percent. the reason for inflation have positive impact on commercial banks profitability and it shows that commercial banks have the capacity to look forward to about future inflation and they lend their money at interest rate which considers the impact of inflation that means they have the capacity to fully anticipate about future inflation. Bank size result in the above regression table 4.5.1 shows that there is a negative impact but it is statistically insignificant impact of Bank Size (total asset) on bank profitability (ROA) which implies that bank size does not significantly affect banks profitability.

Based on the fixed effect regression model result presented in table 4.5.1 deposit to total asset has a positive and statistically significant impact at five percent level of significance on ROA. This indicates that by increasing deposit banks can generate low cost financial source and they can lend and generate better revenue. The coefficient 0.02 indicates that a one percent increase of total deposit to total asset ratio increases private banks profitability by approximately 0.02 percent. This result also supports the finding of Helms (2017) and Muriu (2011) who had found that there is a positive relationship between total deposit to total asset ratio and return on asset by allowing banks getting low cost finance helps them to generate revenue which finally increases private commercial banks profitability.

# CHAPTER FIVE

# 5. CONCLUSION AND RECOMMENDATION

In this paper from chapter four presents descriptive analyses and examined the result of the regression of all independent variables against the theories and the researcher expectations. Besides, the results of findings and discussion were also made with the trained analysis of ROA with the credit risk proxy of loan loose provision ratio.

## 5.1. Conclusion

The main objective of this study was to examine the impact of credit risk on private Commercial bank’s profitability in Ethiopia based on panel data analysis for the period 2013 to 2019. The data was analyzed by using fixed effect model which was selected by using hausman test eviews software was used for analysis.

Based on the analysis of fixed effect regression model loan loose provision ratio, capital adequacy, real domestic product growth rate, inflation rate and total deposit to total asset had a statistically significant effect on the level of return on asset. On the contrary, the results of this fixed effect regression model shows that bank size which is proxy by total asset had insignificant effect on return on asset of private commercial banks in Ethiopia for the period under consideration.

The findings of fixed effect regression result indicated that bank credit risk which is proxy by loan loose provision ratio has negative and statistically significant impact on return on asset.

This tells us that banks can make a profit as far as they can minimize the credit risk.

The result of capital adequacy ratio has positive and statistically significant impact on return on asset of private commercial banks that operate in Ethiopia which indicates that banks with strong capital adequacy or keep the fund in the bank helps them to lend it to profitability projects which increases return on asset

The macroeconomic variables real gross domestic product growth rate have positive and significant effect on private banks performance which means that when the economy is in good situation the economy demand more funds and banks can lend more at high interest rate and it positively affects their profitability. And the other macroeconomic variable that is inflation rate has a positive impact on bank profitability this indicates banks fully anticipate inflation and they manage their money effectively in lending and mobilizing deposits.

Banks size which is proxy by total asset is insignificant to affect banks profitability proxy by return on asset. The other variable total deposit to total asset has a positive impact on banks profitability which implies that when banks can mobilize deposit helps them to provide loans to the profitable business and in tern it positively affects profitability of private commercial banks.

## 5.2. Recommendations

Based on the finding of this paper, the impact of credit risk on Ethiopian private commercial banks profitability the following policy recommendations are forwarded.

* Since credit risk have a negative impact on Ethiopian private commercial banks’ policy makers and top managements need to strength credit follow up and also strength their customer selection to minimize its impact
* Inflation and real gross domestic product growth rate have a positive impact on Ethiopian private banks profitability, therefore top management of private banks need to fully anticipate future inflation through inflation projection or using forecast done by other organizations like national bank of Ethiopia which helps them to adjust their lending interest rate and in turn to maximize their profitability.
* The result of capital adequacy ratio has positive and statistically significant impact on return on banks profitability therefore top management of commercial banks and policy makers need care their financial strength which helps them to increase their profitability by lending to the most profitable business.
* The study recommends that a further study should be done on the impact of credit risk on profitability of Ethiopian private commercial banks by including commercial bank of Ethiopia to generalize about the industry.

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