ST. MARY'S UNIVERSITY
SCHOOL OF GRADUATE STUDIES

THE EFFECT OF CREDIT RISK AND LIQUIDITY RISK ON FINANCIAL PERFORMANCE OF ETHIOPIAN PRIVATE BANKS

By
BRUKTAWIT BELETE WONDIMU

DECEMBER, 2018
ADDIS ABEBA, ETHIOPIA

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**A THESIS SUBMITTED TO ST. MARY'S UNIVERSITY, SCHOOLOF GRADUATE STUDIES
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APPROVED BY BOARD OF EXAMINERS

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DECLARATION

I, the undersigned, declare that this thesis is my original work, prepared under the guidance of Associate Professor Asmamaw Gete. 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

Commercial banks becoming largest financial institution and credit suppliers in Ethiopia. They are growing tremendously in terms of number, size and profitability. However they are facing significant risks like credit and liquidity risks. The main objective of this study is to analyze the effect of credit risk and liquidity risk on the financial performance of Ethiopian private commercial banks. Financial data was collected from annual audited financial report of 16 private commercial banks of Ethiopia over the period of 2013-2017. The study adopted an explanatory research design and analyzed the panel data by using fixed effect multiple regression model. Based on this model, credit risk had negative and statistically significant effect on profitability and liquidity risk had positive and statistically significant effect on profitability. Both risks had significant impact on banks performance. This is, therefore banks should seek mechanisms to improve their risk management capacity efficiency and remain competitive in the market.

Keywords: Commercial Bank, financial performance, Credit risk, Liquidity risk

LIST OF ACCRONYMS

ATM: Automated Teller Machine

BCBS: Basel Committee on Banking Supervision

CAR: Capital Adequacy Ratio

CATAR: Current Asset to Total Asset Ratio

DTAR: Deposit to Total Asset Ratio

FEM: Fixed Effect Model

GDP: Growth Domestic Product

LLPR: Loss Loan Provision Ratio

lnTA: Natural logarithm of Total Asset (Bank Size)

NBE: National Bank of Ethiopia

NPL: None performing Loan

OECD: Organization for Economic Cooperation &Development

OLS: Ordinary Least Square

ROA: Return on Asset

ROE: Return on equity

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CHAPTER ONE

1. INTRODUCTION

1.1 Background of the study

The increasing needs of the society increase and change the role of banking in the economy. Banks play a vital role in the economic development of any country. Jagdeep (2017) argues that "Without a sound and effective banking system, no country can have a healthy economy". In developing economies, which are characterized by poverty, high levels of unemployment, shortage of capital, and poor entrepreneurial skill etc., banks play a far more important role. In any economy, economic development is not possible unless there is an adequate amount of capital formation. The serious capital deficiency faced by developing countries is mitigated by banks. A sound banking system mobilizes the small savings of the community and makes them available for investment in productive enterprises. Banks mobilize deposits by offering attractive rates of interest and thus convert savings into active capital.

People in developing countries have low incomes but banks encourage them to save by introducing variety of deposit schemes to suit the needs of individual depositors. They also mobilize idle savings from the few riches. By mobilizing savings, the banks channel them into productive investments. Thus they help in the capital formation of a developing country (Chetan, 2017). Effective domestic resource mobilization in and by developing countries, is the most sustainable and essential way to provide important development resources for the purpose of sustainable pro-poor growth (Teferi, 2016).

Banks are exposed to high levels of several financial risks from other financial services because of accelerated growth, innovation, modernization, stiff competition and tough regulations. These causes also make the risks diversified and complex. 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 this risks credit risk and liquidity risk are more important because of their effect on the viability of a bank jointly or separately.

Sujeewa (2015) asserts that Credit remains the primary source of revenue for any bank around the world. However the probability of borrowers defaulting on loan commitments has become an increasing concern for banks and particularly for unsecured bank loans. This risk can be categorized as credit risk. The Basel Committee on Banking Supervision (2012) defines credit risk, sometimes referred to as default risk, as the potential that a bank borrower or a counterparty will fail to meet its obligations in accordance with the agreed terms. A bank can face credit risk in many ways. An example can be if a bank lends money for a company or a person in accordance to agreed terms and the counterparty fails to repay the principal and the interest partially or fully on time due to loss in income, bankruptcy, unwillingness, death etc. 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 (Jane et al. 2016).

Basel Committee on Banking Supervision (2008) defined liquidity in banking as the ability of a bank to fund increases in assets and meet obligations as they come due, without incurring unacceptable losses. If a bank fails to manage cash flow obligation properly then the bank will face liquidity risk. Mathias &Kleopatra (2009) point out liquidity can be understood in terms of flows (as opposed to stocks) in other words it is a flow concept. Mekbib (2016) argue that banks fundamentally need to hold optimal level of liquidity to maintain efficiency and operative excellence. Effective and efficient liquidity management is a paramount importance as a liquidity problem in one bank may have industry wide repercussion. According to Mathias & Kleopatra (2009) the probability of not being liquid would suggest that there is liquidity risk.

Banks are engines of economic growth in developing financial systems. A strong banking system plays an important role in efficient allocation and utilization of credit. In Ethiopia, as of 2017 there are eighteen Banks operating under the direct supervision of National Bank of Ethiopia. Sixteen of them are private commercial Banks and the other two banks are government owned policy banks (NBE, 2017). The problem of credit risk and liquidity risk exist in each and every bank. Therefore, it is very essential to assess the credit and liquidity risk on the bank's performance. As the result, this paper tried to analyzing the credit risk and liquidity risk and their effects on financial performance of Ethiopian Private Banks.

1.2. Statement of the problem

Banks are very fragile financial institutions which are built mostly on customer trust and brand reputation. They are highly interconnected with other financial institutions and organizations by facilitating financial transactions or selling financial products. So the failure of a bank causes a wide scale damage on the economy of a country. One reason banks may fail is because of poor management of financial risks. Among financial risks credit risk and liquidity risk usually stand behind most banking failures. Ugoani, et al., (2014) assert that Banks fail when they become unable to meet depositors' demands. And shareholders' funds become eroded due to poor management characterized by the creation of bad loans. Banks should take the two risks more seriously and anticipate adverse changes. Thirupathi et al., (2013) agreed with the prospect theory which states that a person is more likely to take on a risk than to suffer a sure loss.

Banks are exposed to different and advanced financial risks which adversely affect their performance and activities. Managing risk in advance is far better than waiting for its occurrence. Banks must understand and manage the financial risks that they face during their activities. Credit and liquidity risks are the most significant risks and banks must be aware of their effect on the financial performance, existence and growth of the banks individually and/or jointly. Doriana (2013) asserts that in general, liquidity risk is considered as a determinant of other risks such as credit risk or determinant of bank performance. There is a negative relationship between liquidity risk and bank performance. A loan defaultaugments liquidity risk because of the lowered cash inflow and the depreciation it triggers (Ameni, et al., 2017). Credit risk builds up slowly in the system and has a gradual impact on banks' liquidity, whereas liquidity shocks occur suddenly and have a rapid impact on solvency (Zlatuše et al., 2015/2016). A major lesson from the financial crisis of 2007/2008 is that a severe increase in credit risk paired with a contemporaneous drying up of bank liquidity can cause major distress for the financial system. Analyzing both factors jointly is thus pivotal for a thorough understanding of bank risk (Björn et al., 2012).

Ethiopian commercial banks face credit and operational risks more severely than other types of risks. The National Bank of Ethiopia conducted a survey on 15 banks and identified the

nature of risk faced by the banks. One of the questions provided to banks was which three risks had most affected your bank in the last two years and the answers were as follows Credit risk = 60%, Operational risk = 53% and Liquidity risk = 40%, (NBE, 2009).

Most existing studies conducted in Ethiopia are done on the impact of credit risk or liquidity risk on the financial performance of commercial banks such as Misiker (2015), Engedawork (2014), Elias (2015) Tseganesh (2012) and Berhanu (2015). However there is not enough study was conducted the effect of credit risk and liquidity risk on the financial performance of private commercial banks in Ethiopia.

Ameni et al. (2017) suggest both risks separately influence banking stability and their interaction contributes to banking instability. The problem of credit risk and liquidity risk exist in each and every bank. Not handling these risks appropriately not only affect banks performance but can aggravate the financial risks of almost all financial sector of Ethiopia. Credit risk and liquidity risk are the main risks of Ethiopian banks as mentioned above. Not knowing their effect on the performance of commercial banks make worse the problem. As far as the knowledge of the researcher, there are not enough studies or researches have been conducted jointly on credit risk and liquidity risk and their effect on profitability of Ethiopian commercial banks. Therefore, in this paper the researcher tried to fill this gap by analyzing the credit risk and liquidity risk and their effects on financial performance of Ethiopian Private Banks.

1.3 Research question

Based on the statement of the problem and review of related materials this study attempted to give answers to the following questions:

➢ Does credit risk have a significant effect on financial performance of Ethiopian private banks?

➢ Does liquidity risk have a significant effect on financial performance of Ethiopian private banks?

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1.4 Research hypotheses

Hypothesis may be defined as a proposition or set of proposition set forth as an explanation for the occurrence of some specified group of phenomena either asserted merely as a provisional conjecture to guide some investigation or accepted as highly probable in the light of established facts (Kothari, 2004). To carry out this research the following hypotheses will be postulated.

Hypothesis 1:

Credit risk occurs due to limited institutional capacity, inappropriate credit policies, volatile interest rates, poor management, inappropriate laws, low capital and liquidity levels, direct lending, massive licensing of banks, poor loan underwriting, laxity in credit assessment, poor lending practices, government interference and inadequate supervision by the central bank. An increase in bank credit risk gradually leads to liquidity and solvency problems (Kolapo et al, 2012). Based on this the following hypothesis or proposition is placed:

H_0: Credit risk does not significantly affect the financial performance of Ethiopian private banks.

Hypothesis 2:

Liquidity is the ability of the bank to fund asset growth and meet its obligations as they fall due without incurring unacceptable losses. Indeed, the viability of commercial banks depends on the liquidity position of the bank. The optimal level of liquidity is strongly linked to effective banking operations. If liquidity is not generated properly, It can lead to insolvency (in case of low liquidity) (Mohamed, 2015). Based on this the following hypothesis or proposition is placed:

H_0: Liquidity risk does not significantly affect the financial performance of Ethiopian private banks.

1.5. Objective of the study

1.5.1 General objective

The general objective of the study is to examine the effect of credit risk and liquidity risk on banks' financial performance.

1.5.2 Specific objective

➢ To explain the effect of credit risk on the financial performance of Ethiopian private banks.

➢ To explain the effect of liquidity risk on the financial performance of Ethiopian private banks.

➢ To recommend appropriate measures to be taken to control or minimize the financial damage of Credit risk and Liquidity risk to the relevant organs of the private banks specifically and policy makers of the country in general.

1.6. Significance of the study

One of the major reason that forces banks to fail is inefficient knowledge about credit and liquidity risk and their effect on the financial performance of commercial banks. The failure of a bank will adversely affect the country's economy widely. This study can be used as a reference for managers of commercial banks, academic staff and regulatory bodies in order to give a theoretical insight and policy recommendation. It also gives a motivation to other researchers to conduct a research on credit risk and liquidity risk and their effect on profitability of commercial banks.

1.7 Scope of the study

There are seventeen commercial banks which presently operate in Ethiopia. From these seventeen commercial banks, sixteen banks are privately owned and the other is government owned. This study selected the sixteen privately owned commercial banks. The time coverage of the study is five years from 2013 to 2017.

1.8 Limitation of the study

The first limitation of the study is government owned bank, Commercial Bank of Ethiopia is not considered in the study. Therefore, the findings of the study might fail to reflect on the overall banking industry of the country. The second limitation of this paper is it doesn't consider external factor of profitability such as macroeconomic variables (GDP and inflation).

1.9 Organization of the study

This research is organized as follow. In the first chapter the researcher provide a brief introduction about the research topic. Chapter two reviews previous researches for better understanding. Chapter three defines the variables and describe the research process and method of collecting data. Chapter four present the statistical test results and analyzes and discus the results based on the findings. Chapter five also present summary, conclusion and recommendation.

CHAPTER TWO

2. LITERATURE REVIEW

This chapter focus on the review of the theoretical foundation on credit risk, liquidity risk and their effect on the performance of bank profitability. This chapter also explores the empirical reviews from different perspectives on the subject matter being covered.

2.1 Theoretical literature review

2.1.1 Definition of risk

Risk is defined as anything that can create hindrances in the way of achievement of certain objectives. It can be because of either internal factors or external factors, depending upon the type of risk that exists within a particular situation (Hirupathi et al, 2013). Mulugeta (2015) defines risk as anything that can create hindrances in the way of achievement of certain objectives. According to Clara-Iulia (2014) banking risk is defined as an unexpected loss recorded in the banks' asset caused by the market conditions, namely credit or liquidity risks. In fact, banking risks are not represented only by risks specific for the traditional banking activity, but by all the risks that banks face in the current activity.

National bank of Ethiopia (2010) in itsRisk Management Guidelines defines risk and risk-taking as an inherent element of banking and, indeed, profits are in part the reward for successful risk taking. In contrary, excessive and poorly managed risks can lead to distresses and failures of banks. Risks are, therefore, warranted when they are understandable, measurable, controllable and within a bank's capacity to withstand adverse results.

Banks are engines of economic growth in developing financial systems. The importance of the banking sectors is immense in the progress and economic development of any state. Economic development and prosperity come from a well-rounded and developed banking system. A strong banking system plays an important role in efficient allocation and utilization of credit (Waqas et al, 2014).

According to Adeusi et. al. (2014) the banking business, in comparison to other types of human endeavors, is entirely exposed to risks. Banks no longer simply receive deposits and make loans, they also operate in a rapidly innovative sector with a lot of pressure to make profit. Taking risk is core to the Bank's business, and risks are an inevitable consequence of being in the business. The banks' aim is therefore to achieve an appropriate balance between risk and return and minimize potential adverse effects on their performance (Sammy, 2014).

Commercial banks in Ethiopia, in addition to their traditional banking products, have also introduced several new and innovative products like ATM, Debit Card, Mobile Banking, and Internet Banking etc. These technological innovations and the tremendous competition between them increases the risk exposure of these banks considerably

2.1.2 Types of risk

Bank faces many types of risks. Out of these Credit risk, Market risk, Liquidity risk, Operational risk, Reputational risk, Business risk, Systemic risk and Moral hazard are the most important risks that are faced by every bank. Out of these eight risks, credit risk, market risk, and operational risk are the three major risks. The other important risks are liquidity risk, business risk, and reputational risk. Systemic risk and moral hazard are unrelated to routine banking operations, but they do have a big bearing on a bank's profitability and solvency. As Mubbushar (2016) points out Credit risk, Solvency Risk, Liquidity Risk, Interest Rate Risk, Market Risk and Foreign Exchange Risk are the most related risks with banking operations.

Hana (2016) and Thirupathi et al (2013) classify risks in banking industry as financial and non-financial risk. Financial risks are risks which directly affect the financial performance of a bank such as Credit risk, Liquidity risk, and Market risk. The other risks are non- financial risks which affect the financial performance of a bank indirectly.

2.1.3 Definition of credit risk

A bank exists not only to accept deposits but also to grant credit facilities, therefore inevitably it is exposed to credit risk. Credit risk is by far the most significant risk faced by banks and

the success of their business depends on the accurate measurement and efficient management of this risk to a greater extent than any other risks (Kolapo et al 2012).

RBI Guidance (2002) put credit definition in a very simple term as it is the risk that promised cash flows from loans and securities held by the banks may not be paid in full and on time i.e., it is the possibility of default - non-payment or delayed payment. In terms of RBI Guidelines 'Credit Risk is defined as the possibility of losses associated with diminution in the credit quality of borrowers or counterparties. In a bank's portfolio, losses stem from outright default due to inability or unwillingness of a customer or counterparty to meet commitments in relation to lending, trading, settlement and other financial transactions. Alternatively, losses result from reduction in portfolio value arising from actual or perceived deterioration in credit quality.

Olawale (n.d.) has also stated credit creation as the main income generating activity for banks. But this activity involves huge risks to both the lender and the borrower. The risk of a trading partner not fulfilling his or her obligation as per the contract on the due date or anytime thereafter can greatly jeopardize the smooth functioning of a bank's business. On the other hand, a bank with high credit risk has high bankruptcy risk that puts the depositors in jeopardy. In a bid to survive and maintain adequate profit level in this highly competitive environment, banks have tended to take excessive risks. Among the risks credit risk is still most dominant risk in banks worldwide.

Credit risk refers to the risk that a borrower will default on any type of debt by failing to make the required payments. This risk is primarily faced by the lender and includes lost principal and interest, disruption to cash flows, and increased collection costs (Caroline 2014).

Ahmed (2017) defined credit risk as a default risk that due to failure or the inability of customers to return the loan amount obtained from the company and its interest in accordance with the time clock that has been determined. One form of credit risk is non-performing loans, which are classified as substandard, doubtful and loss.

Credit risk occurs due to limited institutional capacity, inappropriate credit policies, volatile interest rates, poor management, inappropriate laws, low capital and liquidity levels, direct lending, massive licensing of banks, poor loan underwriting, laxity in credit assessment, poor lending practices, government interference and inadequate supervision by the central bank (Kithinji, 2010 cited in Kolapo et al 2012). An increase in bank credit risk gradually leads to liquidity and solvency problems. Kolapo et al 2012

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. Banks for international (Basel Committee of Banking Supervision (BCBS)) further explains, 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, inter-bank 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.

According to National Bank of Ethiopia (2010) the key risk in a bank has been credit risk. Indeed, failure to collect loans granted to customers has been the major factor behind the collapse of many banks around the world. Banks need to manage credit risk inherent in the entire portfolio as well as the risk in individual credits or transactions. Additionally, banks should be aware that credit risk does not exist in isolation from other risks, but is closely intertwined with those risks.

2.1.3.1 Measures of credit risk

Sujeewa (2015) posit that Loan provision to Total Loan (LP/TL), Loan Provision to Non-Performing Loans (LP/NPL), Loan Provision to Total Assets (LP/TA) and Non-Performing Loans to Total Loans (NPL/TL) were used as indicators of credit risk. But Kolapo*et. al* (2012) measures credit risk as a function of the ratio of Non-performing loan to loan &

Advances (NPL/LA), ratio of Total loan & Advances to total deposit (LA/TD) and the ratio of loss loan provision to classified loans (LLP/CL).

Some scholars' measure credit risk in different ways, some of the examples are Debt to Equity ratio. It is the most common ratio used to represent capital structure. Typically, a higher Debt to Equity ratio indicates higher credit risk (Debt to Equity = Total Debt /Common Equity), Debt to Tangible Equity is a variant of the Debt to Equity ratio (Debt to Tangible Equity = Total Debt / (Common Equity - Intangible Assets)), Debt to Total Capital measures the level of the debt relative to the market value of total capital (Debt To Total Capital = Total Debt / (Total Debt + Market Capitalization)), The Liabilities to Assets ratio (also referred to as Debt Ratio) measures the proportion of a firm's assets financed by liabilities (Liabilities to Assets = Total Liabilities/Total Assets).

2.1.4 Definition of liquidity risk

The fundamental role of banks in the maturity transformation of short-term deposits into long-term loans makes banks inherently vulnerable to liquidity risk Tseganesh (2012). Liquidity risk is mostly triggered by consequences of other financial risks such as credit risk, interest rate risk and foreign exchange risk Caroline (2014).

Liquidity is the life blood of a banking setup. Insufficient liquidity is one of the major reasons for bank failures, holding liquid assets has an opportunity cost of higher returns. Adequate liquidity is also needed to avoid forced sale of asset at unfavorable market conditions and at heavy loss or saves against involuntary or non-voluntary borrowing from central bank or national bank in order to meet the liquidity requirement. Liquidity risk generally arises when a business or individual with immediate cash needs, holds a valuable asset that it can't trade or sell at market value due to a lack of buyers, or due to an inefficient market where it is difficult to bring buyers and sellers together.

Banks are required to hold a considerable position in liquid assets. As per National Bank of Ethiopia directive no. "Liquidity Requirement (5th Replacement) Directives No.

SBB/57/2014" These Directives shall be applicable to all commercial banks (excluding Development Bank of Ethiopia) operating in Ethiopia. Any licensed commercial bank shall maintain liquid assets of not less than fifteen percent (15%) of its net current liabilities. The directive also requires all commercial banks to submit to the Banking Supervision Directorate of the National Bank properly certified liquidity positions report of the week ending each Wednesday not later than Tuesday of the following week.

This directive of the national bank defines Liquid Asset which includes cash, deposits with the National Bank and other local and foreign banks having acceptance by the National Bank, other assets readily convertible into cash expressed and payable in Birr or foreign currency having acceptance by the National Bank, deposits held in Organization for Economic Cooperation and Development (OECD) member countries' currencies and payable by banks of OECD member countries and in such other currencies as may be approved by the National Bank as well as securities issued by OECD member countries denominated in currencies of such countries and such other assets as the National Bank may from time to time declare to be liquid assets; and Current Liability. Current Liability refers to the sum of demand (current) deposits, savings deposits and time deposits and similar liabilities with less than one-month maturity.

Liquidity is the ability of the bank to fund asset growth and meet its obligations as they fall due without incurring unacceptable losses. Indeed, the viability of commercial banks depends on the liquidity position of the bank. The optimal level of liquidity is strongly linked to effective banking operations. If liquidity is not generated properly, It can lead to insolvency (in case of low liquidity) (Mohamed,2015).

According to Naser (2013) liquidity risk is a risk arising from a bank's inability to meet its obligations when they come due without incurring unacceptable losses. Recent studies indicate that liquidity risk arises from the inability of a bank to accommodate decreases in liabilities or to fund increases in assets. An illiquidity in a bank means that it cannot obtain sufficient funds, either by increasing liabilities or by converting assets promptly, at a reasonable cost.

Pavla (2013) suggests that liquidity risk arises from the fundamental role of banks in the maturity transformation of short-term deposits into long-term loans. He divides liquidity risk

into two, funding liquidity risk and market liquidity risk. Funding liquidity risk is the risk that the bank will not be able to meet efficiently both expected and unexpected current and future cash flow and collateral needs without affecting either daily operations or the financial condition of the firm. Market liquidity risk is the risk that a bank cannot easily offset or eliminate a position at the market price because of inadequate market depth or market disruption.

Markus K. and Lasse H. (2009) define Liquidity as the availability of funding into two, Market Liquidity and Funding Liquidity. Market Liquidity is the ease with which it is traded. Funding Liquidity is the ease with which they obtain funding. Market Liquidity risk is the risk that the market liquidity worsens when one needs to unwind a position. It is low when it is difficult to raise money by selling an asset that is when selling depresses the sale price. Funding Liquidity Risk is the risk that a trader cannot fund his position and is forced to unwind. It is high when it is easy to borrow money to purchase assets. Margin lending is short term since margins can be adapted to market conditions on a daily basis

2.1.4.1 Measures of liquidity risk

Measuring liquidity risk can be challenging, primarily because the underlying variables that drive exposures can be dynamic and unpredictable. Indeed, liquidity risk is often considered to be more difficult to measure than other dimensions of financial risk precisely because it is so fluid. Although some aspects of asset and funding liquidity risk are readily identifiable and quantifiable, others are not; this is particularly true when we consider joint asset/funding risks and off-balance sheet/contingent transactions. Despite these challenges some attempt must be made to estimate the relative magnitude of risk, focusing particularly on the composition of corporate liquidity and the cash flows created by the balance sheet and contingencies Erik Banks (2018).

Pavla (2013) measures liquidity risk by two methods. Liquidity ratios and Liquidity gap. Liquidity ratios are various balance sheet ratios which should identify the main liquidity trends. These ratios reflect the fact that a bank should be sure that appropriate, low-cost funding is available in a short time. Liquidity gap is the difference between assets and

liabilities at both present and future dates. According to Sadiaet. al. (2015) Liquidity gaps are the disparities between assets and liabilities that cause liquidity risk. Risky Liquid Assets to Total Assets (RLA) is the ratio that is used to measure how big the risky liquid assets of banks are which can be converted to cash by selling them in low price.

According to Mohamed (2015) liquidity is measured by two methods, Liquid Assets / Total Assets and Total Loans / Total Deposits. He also measures Financial Performance as Capital / Total Assets, Operating Costs/ Total Assets, Growth Rate of GDP, Inflation Rate, and Delayed Liquidity.

2.1.5 Determinants of bank performance

Determinants of banks' profitability normally consist of factors that are within the control of commercial banks. They are the factors which affect the revenue and the cost of the banks. Some studies classify them into two categories namely the financial statement variables and non-financial statement variables. The financial statement variables include factors that are directly related to the bank's balance sheet and income statement while the non-financial statement variables include factors like the number of branches of a particular bank, location and size of the bank (Tom 2015).

Nicolae et al (2015) assess the main determinants of banks' profitability in EU27 over the period 2004-201. They split the factors that influence bank profitability in two large groups: bank-specific (internal) factors and industry specific and macroeconomic (external) factors. They consider as proxy for banks profitability the return on average assets (ROAA) and the return on average equity (ROAE).

Anila (2015) divide determinants of banks' profitability into two internal and external factors. Internal factors are influenced by a bank's management decisions, the internal factors such as the management decisions on are balance sheets and/or profit and loss accounts, size of the bank, capital, risk management and expenses. Whereas external factors are, beyond the control of management, the macroeconomic variables, which reflect the economic environment where banks operate like GDP, inflation rate, interest rate, market growth and market share. This internal factors affect the profitability of the bank directly.

Though banks tend to be more profitable when they are able to undertake more lending activities than increasing their size or capital or decreasing expense. Due to the controlling organ policy like credit cap and low credit portfolio quality credit risk is high and it affect profitability significantly. Among the external determinants, only the inflation rate shows the strongest impact on banks' return on assets.

According to Naseret et. al. (2013) determinants of banks' performance classified as internal and external factors. Internal factors focus on the special characteristics of banks such as bank size, bank size squared, bank's capital, credit risk, and liquidity risk, while, external factors include macroeconomic variables, i.e., gross domestic product and inflation. He also suggests that such variables like bank's size, bank's asset, gross domestic product and inflation will cause improvement of the performance of banks while credit risk and liquidity risk will weaken the performance of a bank.

2.1.5.1 Measurements of bank performance

Bank performance is commonly measured by return on equity, ROE (Net income/Average Equity), return on asset, ROA (Net income /Total assets) and the indicator of financial leverage or (Equity/Total Assets).

Samuel (2013) measured bank performance by the return on assets (ROA), the return on equity (ROE) and net interest margin (NIM) which is usually expressed as a function of both internal and external determinants. He further elaborated that return on assets, ROA (Net profit after tax/Total assets) reflects the ability of a bank's management to generate profits from the bank's assets while the return on equity, ROE (Net profit after tax/Total Equity) specifies the return to shareholders on their equity.Net interest margin, NIM (Interest income -Interest expense/Total assets) measures the gap between the interest paid to savers/lenders and the interest the bank receives from borrowers/debtors.

2.2 Empirical literatures review

2.2.1 Effect of credit risk on the performance of commercial banks

Credit risk is a serious threat to the performance of banks; therefore various researchers have examined the effect of credit risk on banks in varying dimensions.

Sujeewa (2015) evaluated the effect of credit risk on the profitability of the commercial banks in Sir Lanka. Return on Assets (ROA) ratio is used as measure of bank performance and Loan provision to Total Loan (LP/TL), Loan Provision to Non-Performing Loans (LP/NPL), Loan Provision to Total Assets (LP/TA) and Non-Performing Loans/ Total Loans (NPL/TL) ratios were used to measure credit risk. Data were collected from 8 commercial banks which have superior financial performance from the 24 commercial banks in Sir Lanka from the period starting from 2009 to 2013 for five years. The finding reveals that non-performing loans and provisions have an adverse impact on profitability.

Mubbushar (2016) and Idowuet et.al. (2014) tested the relationship betweencredit risk management and financial performance of commercial banks in their respective countries. In their study, data was analyzed by using panel regression model. Return on Equity (ROE) and Return on Asset (ROA) were used as the performance indicators while Non-Performing Loans (NPL) and Capital Adequacy Ratio (CAR) as credit risk management indicators. The result showed that credit risk management has significant impact on financial performance of commercial banks.

Saeed & Zahid (2016) found that credit risk indicators had positive association with profitability of the banks. The research was conducted on 5 large United Kingdom commercial banks. They took two dependent variables, Return on Equity (ROE) and Return on Asset (ROA), for measuring profit whereas credit risks were measured by net charge off (impairments) and non-performing loan.

In a study to investigate the effect of credit risk on financial performance of commercial banks in Kenya, Jane (2016) used credit risk measured by capital to risk, weighted assets, assets quality, loss loan provision, loan and advance ratio and financial performance by return on equity (ROE). The data was taken from 43 commercial banks for the period between the years 2005 and 2014. She used f-test to determine the significance of the regression while the coefficient of determination within and between R^2 was used to determine how much variation in dependent variables is used as explained by independent variables. The result shows that credit risk has a negative and significant relationship with bank profitability, poor asset quality or high non-performing loan to total asset is related to poor bank performance both in short run and long run.

2.2.2 Effect of liquidity risk on the performance of commercial banks

In their paper, Étienne and Christopher (n.d.) analyzed the impact of liquid asset holdings on bank profitability for a sample of large U.S. and Canadian banks. Results suggest that profitability is improved for banks that hold some liquid assets, however, there is a point at which holding further liquid assets diminishes a banks' profitability, all other things being equal.

On her part Tseganesh (2012) identified eight factors affecting bank liquidity. Data was selected from 8 commercial banks in Ethiopia which covered the period from 2000 to 2011. With the selected data analyzed the result showed that capital adequacy, bank size, share of non-performing loans in the total volume of loans, interest rate margin, inflation rate and short term interest rate had positive and statistically significant effect on banks liquidity. Real GDP growth rate and loan growth had statistically insignificant effect on banks liquidity. In her findings among the statistically significant factors affecting banks liquidity, capital adequacy and bank size had positive effect on financial performance whereas, non-performing loans and short term interest rate had negative impact on financial performance. Interest rate margin and inflation had negative but statistically insignificant impact on financial performance.

Chug et.al. (2009) investigated the causes of liquidity risk and measurements of liquidity risk besides liquidity ratio. The causes of liquidity risk include components of liquid assets and dependence on external funding. They classified countries as bank based or market based financial systems. The result shows that liquidity risk is negatively related to bank performance in market-based financial systems. However, it has no effect on bank performance in bank-based financial system.

Birhanu (2015) showed that Bank size and Loan growth had negative and statistically significant impact on banks liquidity as measured by Liquid Asset to Total Asset. Real growth rate of gross domestic product on the basis of price level, Interest rate on lending, Non-performing loans in the total volume of loans, Bank size, Actual reserve ration and Short

term interest rate had positive and statistically significant impact as analyzed by regression analysis. Among the statistically significant factors affecting banks liquidity, bank size had positive and statistically significant impact on Profitability whereas, growth rate of gross domestic product on the basis price level, Actual reserve rate and Non-performing loans in the total volume of loans had negative impact on profitability. Therefore, the study conducted on eight commercial bank of Ethiopia covering the period from 2002/03 to 2013/14 revealed that the impact of bank liquidity on commercial bank profitability was non-linear. Bank size, and adjusting the liquidity position with better strategy for managing credit risk (NPL) has positive impact on profitability.

Therefore, the study conducted on eight commercial bank of Ethiopia covering the period from 2002/03 to 2013/14 revealed that the impact of bank liquidity on commercial bank profitability was non-linear. Bank size, and adjusting the liquidity position with better strategy for managing credit risk (NPL) has positive impact on profitability.

2.3 Conceptual Frame Work

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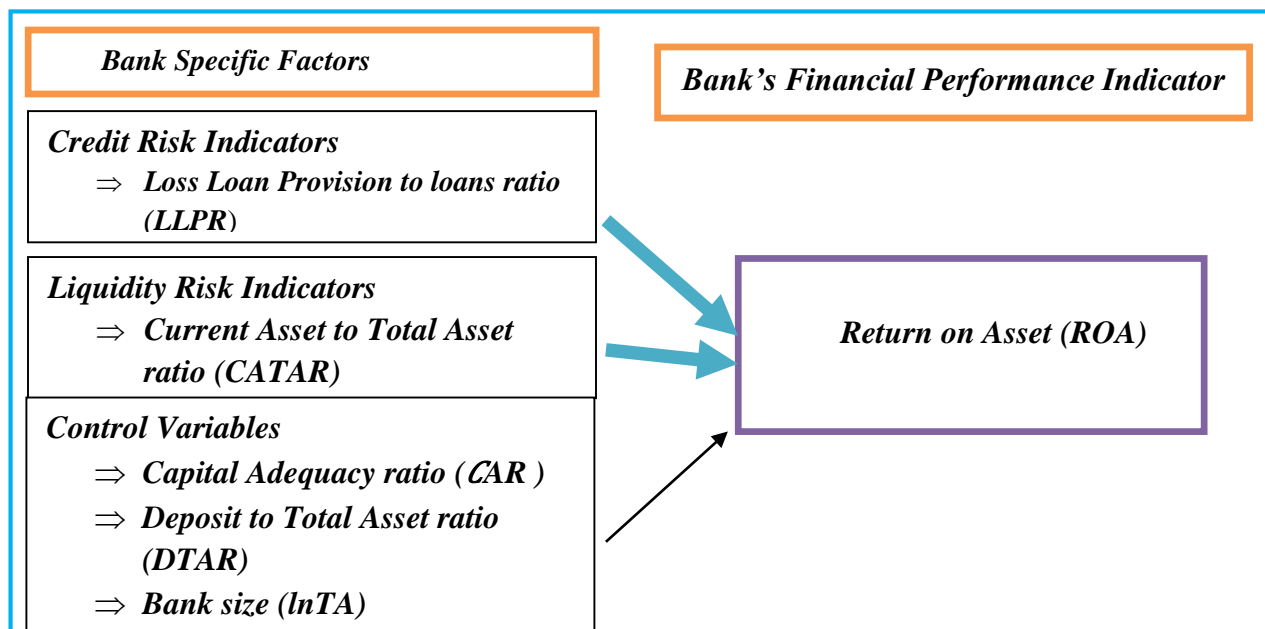

Figure 1*: Conceptual frame work*

CHAPTER THREE

3. RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

Research method refers to the techniques and procedures used to obtain and analyze research data, including for example questionnaires, observations, interviews, and statistical and non-statistical techniques whereas research methodology is the theory of how research should be undertaken, including the theoretical and philosophical assumptions upon which a research is based and the implications of these for the method or methods adopted (Saunders et. al., 2009). The primary objective of this research was to find out the effect of credit risk and liquidity risk on the financial performance of Ethiopian private commercial banks.

3.2 Research design

There are three approaches to conduct any research: Qualitative, Quantitative and Mixed approaches. This study will employ a quantitative approach which is consistent with the nature of the problem and its questions. According to Creswell (2009), Quantitative research is a means for testing objective theories by examining the relationship among variables. These variables, in turn, can be measured, typically on instruments, so that numbered data can be analyzed using statistical procedures. The main intention of this study was to find out the effect of credit risk and liquidity risk on financial performance of Ethiopian Private Banks and to examine the relationship between credit risk and liquidity risk. Therefore, the researcher examined the quantitative data collected from annual reports of the study's population to get sufficient empirical evidences.

This study deployed descriptive and explanatory design.Descriptive studies, are designed to obtain data that describe the characteristics of the topic of interest in the research (Hair et al., 2011, p.148). Studies that establish causal relationships between variables may be termed as explanatory research (Saunders et. al., 2009). In other words, explanatory design tries to explain the causal relationship between variables. Based on the purpose of this research,

among other research designs the researcher believed descriptive and explanatory survey design are the most suitable to address the objectives of the study and to answer its questions. The study also used panel data as it assumed that individual firms, states or countries are heterogeneous.

3.3 Target population

Currently there are seventeen commercial banks operating in Ethiopian banking industry in which sixteen are privately owned banks and the other is government owned bank. The targeted population of this study was all privately owned commercial banks having at least five years of experience in the industry as of June 30, 2017. As a result the researcher considered all private commercial banks in Ethiopia that have operated in the industry between 2013 to 2017 G.C. The rational for selecting this time period was to consider all private bank in Ethiopia, which is to incorporate the last joining bank in the industry. So as to increase the number of observation. Since the researcher chose the entire private commercial banks in Ethiopia, then the study deployed census study.

3.4 Data source and data collection

Data are the facts and figures collected for records or any statistical investigation. There are two sources of information normally used for research purposes primary and secondary sources of data. Primary sources are those in which we need to conduct a new survey for gathering information at different levels with regard to the inquiry. Secondary sources are those which are made available or have been collected for other research purposes (Adams et. al., 2009).

The study is conducted based on secondary data gathered from published audited annual financial reports of Ethiopian Private Banks. The main incentive of using secondary data for the study is to explain the effect of the independent variables of the study on dependent variable ones. The data for analysis was collected through the review of audited annual financial reports (i.e. Balance Sheet, Income Statement and financial report notes) of the banks and relevant previous literatures. The researcher collected the financial report of the banks from their respective websites for the period covering from 2013 to 2017.

3.5 Method of data analysis

In order to arrive at meaningful facts and conclusions, the research investigated the effect of credit risk and liquidity risk on financial performance of Ethiopian Private commercial Banks. The researcher used multiple regression analysis to explain the effect of the various aspects of credit risk and liquidity risk on the financial performance of Ethiopian Private commercial Banks and answered the research questions. Data from Balance sheet and income statement of the targeted banks for the period from 2013 to 2017 G.C., scrutinized through the Ordinary Least Squares (OLS) model to explain the effect of independents variable on the dependent variable of the study.

The data collected from the banks' financial report is presented using tables. Descriptive statistics is applied to describe the trends of the variables used in the study to explain the effect of credit risk and liquidity risk on banks' financial performance. Inferential statistics is also used to infer on the findings regarding the effect and of the independent variables on dependent variable. In doing so the researcher established regression model.

3.6 Operationalization of the research topic

In this section the researcher identified the dependent variable and independent variables of the research. Therefore the dependent variable, denoted by "Y", has been identified in the study as the performance of Ethiopian private banks which has been measured by Return on Asset (ROA). The independent variables, denoted by "X", have been identified in the study as the effect of credit risk and liquidity risk. To investigate the effect of credit risk on banks' profitability the researcher used one indicator; Loss loan provision ratio. Similarly, to investigate the effect of Liquidity risk the researcher used one indicator; Current/Liquid asset to Total Asset ratio.

3.6.1 Variable description

There is no single variable that indicates the level of credit risk and liquidity risk being considered as a proxy for performance indicator. Different authors used different measures of credit risk, liquidity 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 and liquidity risk indicator greatly depends on the availability of data related to financial performances of banks.

Banks profitability is influenced by internal and external determinants. In this research the researcher study only internal determinants of profitability such as credit risk which is denoted by Loss Loan provision and liquidity risk which also denoted by Current asset to total asset ratio. The researcher also considered Capital adequacy, Deposit to total Asset ratio and Bank size as a control variable to determine profitability.

As the researcher mentioned before the variables used are summarized in the following table.

Table 3.1: Variable description

	Variable Name	**It Measures**
Dependent variable	ROA	Banks profitability
Independent variable	LLPR	Credit risk
	CATAR	Liquidity risk
Controllable variable	CAR	
	DTAR	
	lnTA	

3.6.1.1 Dependent variable

➢ *Return on Asset (ROA)*:- It is a ratio commonly used to measure commercial banks' profitability. It is computed by dividing operating income before tax by total Asset. When it comes to bank, assets mean the amount of outstanding balance in the loan portfolio and the quality of assets denotes that the bank is able to generate income from the loan accounts. Normally, banks will not have non-performing assets and a bank which have relatively small non-performing assets (loan) is considered to be having better asset quality which makes the banks more profitable.

3.6.1.2 Independent variable

According to a study conducted by many scholars expressed credit risk by None-performing Loan (NPL), Non-performing loan to loan & Advances (NPL/LA), ratio of Total loan & Advances to Total deposit (LA/TD) and the ratio of loss loan provision to classified loans (LLP/CL)Non-performing loans to Gross loans (NPL/GL), Provision for facilities loss/Net facilities and the leverage ratio. Liquidity risk also expressed by Liquidity Coverage Ratio (LCR), Net Stable Funding Ratio (NSFR), and Current Ratio (CR). In this research the following determinates of credit risk, liquidity risk and control variable were nominated.

➢ **Loss Loan Provision to loans ratio (LLPR**):- is used to proxy the credit risks. Changes in credit risk may reflect in the health of the bank's loan portfolio. It is an indicator of how a bank is protected against future losses it could have. An increase in this variable shows the state of caution shown by the bank vis-à-vis its loans granted. So, it is expected to be negative effect on bank performance.

➢ **Current Asset to Total Asset ratio (CATAR):-** it indicates that the proportion of liquid asset in terms of total asset. This ratio helps to measure the liquidity of the bank.

➢ **Capital Adequacy ratio (***C***AR):-** measured by a ratio of total capital over weighted asset to risk. This ratio is one of the determinant of performance and financial stability of banks and financial institutions. Sometimes called solvency ratio. Capital adequacy is sufficient funds to absorb losses to protect depositors, creditors, and financial institutions in the interest of maintaining banking system stability. Therefore, it is expected to be positive effect on bank's performance.

➢ **Deposit to Total Asset ratio (DTAR):-** is a variable measuring the amount of deposits held by a bank proportional to its total assets. Deposits are banks' primary sources of funds that can be invested to generate income.

➢ **Bank size (lnTA):-** Total assets of the bank are used as indicator for bank size and it is measured by natural logarithm of total asset. The effect of bank size on profitability is generally expected to be positive.

3.6.2 Model specification

The main intention of the researcher is to examine the effect of credit risk and liquidity risk on the profitability of private commercial banks in Ethiopia. In doing so, Panel data model was used in order to achieve objectives of the research. Therefore a panel data model is taken in to consideration in computation of the parameters of the study. Based on the collected panel data the researcher used regression model to test hypotheses of the study. The general function of the model written as follows;

Profit (ROA) = f *(credit risk, Liquidity risk)*

Considering that we have more than one independent variable, we introduced the panel multiple regression model as follows;

$$Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + ... + \beta_n X_{nit} + \varepsilon_{it} \quad .... \textit{(Equation 1)}$$

The above equation transformed into the study's panel multiple regression model as follows.

$$ROA_{it} = \beta_0 + \beta_1 LLPR_{it} + \beta_2 CATAR_{it} + \beta_3 CAR_{it} + \beta_4 DTAR_{it} + \beta_5 \ln TA_{it} + \varepsilon_{it} ....Equation\ 2$$

Where:

ROA_{it}= Return on Asset of bank i at time t

$LLPR_{it}$= Loss Loan provision to total Loan ratio of the bank i at time t

$CATAR_{it}$= Current Asset to Total Asset ratio of Bank i at time t

CAR_{it}= Capital Adequacy of bank i at time t

$DTAR_{it}$= Deposit to Total Asset ratio of bank i at time t

$lnTA_{it}$= Natural log of Total Asset of Bank i at time t

Where $t = 2013 - 2017$

i = private commercial banks in Ethiopia

$\beta_{0=}$ constant for each banks

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$\beta_1, \beta_2, \beta_3, \beta_4$ and β_5 cofficients of the regressors

$\varepsilon_{it} =$ within entity error

Furthermore, in order to identify the appropriate model (fixed or random effect model) the hausman test was applied. In addition to this, various statistical tests such as normality, cross-sectional-dependency and multicolinearity was conducted to decide whether the model proposed in the study is appropriate and fulfill the assumption of classical linear regression model (CLRM).

CHAPTER FOUR

4. DATA ANALYSIS, RESULT AND DISCUSSIONS

4.1 Introduction

The preceding two chapters dealt with literatures related to the topic and research methodology. This chapter is organized in a way to answer the research questions. The study has a time series segment spanning from the period 2013 up to 2017 and a cross sectional segment which considered sixteen Ethiopian private commercial banks based on the available data. Detail analyses about the descriptive statistics and regression result have been made.

4.2 Descriptive statistics

In this section descriptive statistics and trend analysis for the dependent variable; Return on Asset (ROA) and explanatory variables involved in the regression model are presented. Mean, standard deviation, minimum and maximum values are used to analyze the general trends of the data from 2013 to 2017 for the variables which are included in the study.

Table 1: Descriptive Statistics of Dependent and Independent Variables

Variable	Observation	Mean	Std. Dev.	Min	Max
ROA	80	0.040	0.014	0.003	0.102
LLPR	80	0.019	0.014	0.010	0.088
CATAR	80	0.236	0.066	0.122	0.419
CAR	80	0.170	0.053	0.093	0.442
DTAR	80	0.752	0.108	0.419	1.456
lnTA	80	8.825	1.029	5.935	10.645

Source: Research STATA output, 2017

Return on Asset is an indicator of how efficient a company is using its assets to generate profit before contractual obligation must be paid. The overall mean value of *ROA* is 0.04(4.0%) this shows that the rate of their efficiency to generate profit by using their asset. In other word during the five years under the study all the private banks able to generate profit on an average of 4.0% of their total asset. The minimum and maximum values of *ROA* indicate that the list income generated over the invested asset in the sector are 0.3% which is registered by Cooperative Bank of Oromia in year 2016. The maximum percentage of *ROA* scored in the period under study is 10.20% which is registered by Lion international Bank in the year 2013. The standard deviation for *ROA* during the five years under study was 1.41%, which indicates that the profitability variation among the private commercial banks against their asset is very immaterial.

The mean value or average percentage of Loss Loan Provision Ratio (*LLPR*) during the five years was 1.9%. It indicates that the average percentage of loss loan provision that all private banks held during the five years under study was 1.9% of their total outstanding loan balance. The industry minimum percentage of loss loan provision to outstanding balance during the five years was 1% which was registered by Addis bank and Debub Global bank for the year 2013 and Enat Bank for three consecutive years starting from 2013. Whereas, the maximum percentage of *LLPR* during the five years under the study was 8.8%, which registered by Zemen Bank in year 2014. The variation of the percentage of LLPR from the mean percentage which denoted by standard deviation scored between year 2013 to 2017 was about 1.4%.

The standard deviation for *CATAR* is 6.62%. It indicates that the existence of moderate variation amongst the private commercial banks during the period under cover. The mean value of the percentage of Current asset to total asset is 23.56% with the minimum and maximum value of *CATAR* is12.20 % and 41.9% respectively.

Capital Adequacy ratio (*CAR*) which is presented as controlling variable was registered as an average of 17.0% during the period under study. The minimum capital adequacy ratio is 9.3% which is slightly higher than the National Bank of Ethiopia current requirement of 8 % which means almost all private banks which are compliance as they have been reaching the required level of Basel II standards. The maximum percentage was about 44.20%. The standard

deviation was 5.3% which shows the existence of relatively moderate variation in capital adequacy ratio among the private commercial banks.

During the five year under envisage average percentage of Deposit to total Asset ratio (*DTAR*) is 75.18%. The maximum and minimum percentage registered between years 2013 to 2017 was 41.90% and 145.6% respectively. These scores are registered by Debub Global Bank and Enat Bank in the same year 2013 respectively. The variation from the mean value of Deposit to total Asset ratio during the five years under coverage, Standard Deviation, was registered 10.78%, which is still showed the percentage distribution of the Deposit to total Asset ratio of the private banks during the period under the study was not evenly distributed.

The mean value of Bank size (lnTA) in the banking sector for the five years under envisage was about 6.7[1]. The standard deviation of Bank size, one of the controllable variable was 0.0027, which shows the existence of relatively low variation from the mean value in the variable between the private commercial banks in Ethiopia. The maximum value of Bank size of the private banks during the five years under the study was 41.9 and the minimum value was 0.4.

---

[1] Since the total bank asset or bank size was transformed into logarithm, we need to convert the data into original value by using exponential. For instance the mean value 8.825 become exp (8.825)= 6.7 billion Birr. All statistic values of bank size are in billion birr.

Figure 2: Trend of Return on Asset across banks (2013-2015)
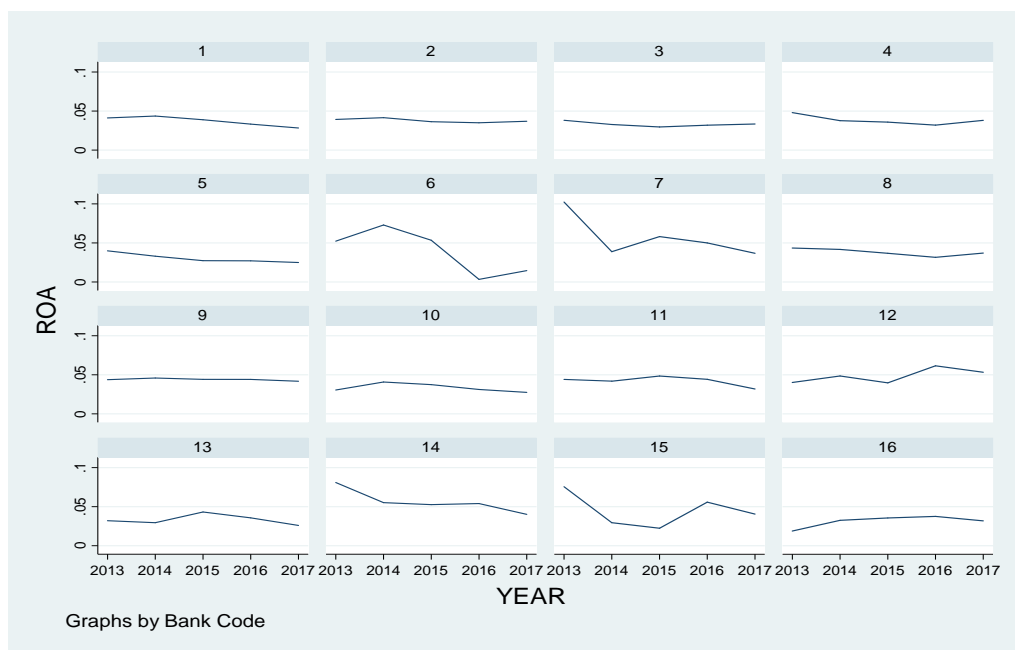
Source: Research STATA output, 2017

In addition to the above descriptive statistics a trend analysis was done using graphs to examine the trend of return on asset across banks. The above Figure 2 shows the trend movement of ROA over the five-year period. The trend plot reveals that for most banks, ROA did not change much with time period under study. There were however some few cases where ROA appeared to change significantly i.e. bank code of 10, 11, and 15.

4.3 Multicollinearity Test

Multicollinearity means that one of the independent variables is not really necessary to the model because its effect/impact on the model is already captured by some of the other variables. This variable is not contributing anything extra to the predictions and can be removed. It happens when one or more explanatory variables are highly linearly related to each other. Perfect multicollinearity means one explanatory variable is a perfect linear function of any other explanatory variables, which is fairly easy to avoid. Multicollinearity will cause the variances and standard errors of the estimates to increase and the t-scores to decrease.

In this research, the researcher therefore will test the multicollinearity between the explanatory variables of LLPR, CATAR, CAR, DTAR and lnTA using correlation coefficent values and variance inflation factor (VIF). If the correlation coefficient is high in absolute value, then the variables are quite correlated and multicollinearity is a potential problem. Some researchers pick an absolute value of 0.80, and concern about multi collinearity when the correlation coefficient exceeds 0.80 (Studenmund, 2016).

On the other hand this study adopted the rule of thumb for VIF value 5 as the threshold. The VIF value greater than 5 shows the existence of multicollinearity. High correlation between independent variables though can lead to a high value of the adjusted R-squared coefficient which may be misleading. Adjusted R-square is the coefficient of determination that gives the degree to which the predictor variables in their entirety explain variations in the dependent variable.

Table 2: Correlation matrix and variance inflation factor (VIF)

```
. correlate LLPR CATAR CAR DTAR lnTA
(obs=80)

                    LLPR      CATAR       CAR      DTAR      lnTA

       LLPR       1.0000
      CATAR       0.2846    1.0000
        CAR      -0.2093    0.1855    1.0000
       DTAR       0.0523   -0.1687   -0.4033    1.0000
       lnTA       0.0868   -0.3591   -0.7900    0.0957    1.0000


. vif

    Variable         VIF       1/VIF

         CAR        4.21     0.237655
        lnTA        3.88     0.257420
        DTAR        1.54     0.647828
       CATAR        1.41     0.707206
        LLPR        1.18     0.847639

    Mean VIF        2.45
```

Source: Research STATA output, 2017

These results indicated that the VIF values of the independent variables were within the threshold of 5. This indicated that that there was no threat of multicollinearity problem. Furthermore, all correlation results are below 0.8 which reveals no multicollinearity problem.

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The result, therefore implied non- existence of a multicollinearity problem among the variable and hence the level of multicollinearity in the model could be tolerated (Table2).

4.4 Model Selection (Random Effect Vs. Fixed Effect Model)

To decide between fixed or random effects a Hausman test is conducted where the null hypothesis is that the preferred model is random effects vs. the alternative the fixed effects (Green, 2008). Based on this, a Hausman test is performed as a first run of a fixed effects model and save the estimates, then run a random model and save the estimates, then carry out the test. As the result, the Hausam test result is explored and the Hausman model selection test for this study has a p-value of less than 0.05 for the regression models. Based on this score, fixed effect model is preferable (Table 3).

Table 3: Hausman test result

```
. hausman fixed random

                 ──── Coefficients ────
                  (b)            (B)            (b-B)        sqrt(diag(V_b-V_B))
                 fixed          random        Difference            S.E.

      LLPR      -.5210876      -.0977071      -.4233805          .1495577
     CATAR       .0589738       .0780243      -.0190505          .0107428
       CAR       .2267037       .181408        .0452957          .034865
      DTAR      -.00414        -.0010991      -.0030409          .0065198
      lnTA       .0004837       .0042541      -.0037704          .0029003

                          b = consistent under Ho and Ha; obtained from xtreg
          B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

              chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                      =        39.53
            Prob>chi2 =      0.0000
```

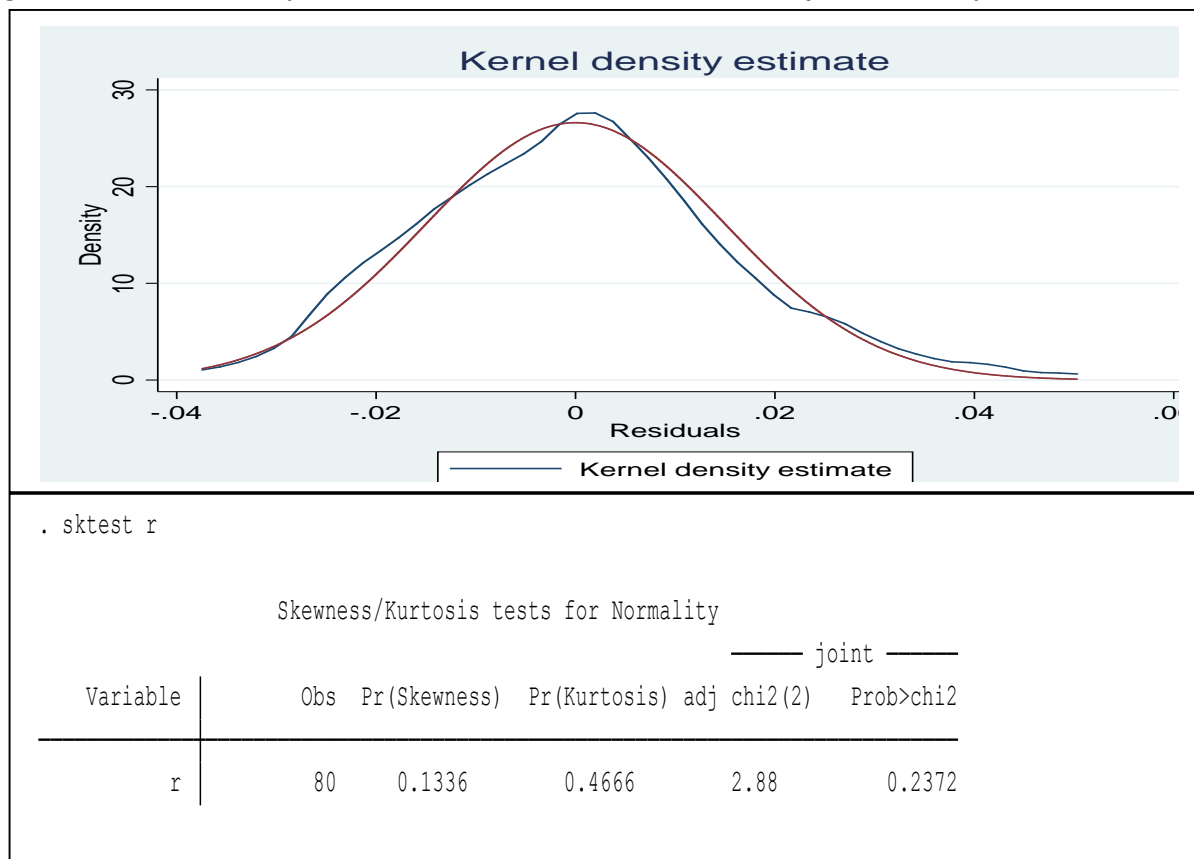*Source: Research STATA output, 2017*

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4.5 Model Diagnostic Tests

In this study various statistical tests are performed to check the statistical assumptions are satisfied. The tests were conducted to make sure that the statistical analysis conducted coincide to regression assumption hence avoid spurious and bias findings.

4.5.1 Normality Test

One of the Classical Linear Regression Model (CLRM) assumptions is that the error term is normally distributed with the mean of error being zero. The normality of error term is examined using the graph to detect the pattern of the residual and skewness and kurtosis test statistics. The null hypothesis under skewness and kurtosis test for normality is that the residuals are not significantly different from a normal distribution.

Figure 3: Kernel Density Estimate and Skewness/Kurtosis Test for Normality


```
. sktest r

        Skewness/Kurtosis tests for Normality
                                              ------ joint ------
    Variable |    Obs  Pr(Skewness)  Pr(Kurtosis)  adj chi2(2)   Prob>chi2
-------------+------------------------------------------------------------
           r |     80     0.1336        0.4666        2.88         0.2372
```

Source: Research STATA output, 2017

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The kernel density estimate of residual graph reveals that the residual estimates are following the normal density curve. Furthermore, the null hypothesis under skewness and kurtosis test for normality is that the residuals are not significantly different from a normal distribution. Given that the p-value was greater than 0.05 which is 0.23 for the residual, we failed to reject the null hypothesis and thus the conclusion that the residuals are normally distributed (Figure 3).

4.5.2 Test for Cross Sectional Dependence (Autocorrelation)

Pasaran CD (Cross-Sectional Dependence) test is used to test whether the residuals are correlated across entities. Cross-sectional dependence can lead to bias in tests results (also called contemporaneous correlation). The null hypothesis is that residuals are not correlated. The results of this test are in figure 4 below.

Table 4: Cross sectional dependence test

```
. xtcsd, pesaran abs


Pesaran's test of cross sectional independence =    -0.649, Pr = 0.5166


Average absolute value of the off-diagonal elements =    0.469

```

Source: Research STATA output, 2017

The results indicated in the above table 4 reveals that since the p-value is 0.469 we failed to reject the null hypothesis. So, we can conclude that residuals are not correlated or there is no cross-sectional dependence in the dataset.

4.6 Analysis and interpretation of the models

4.6.1 Regression analyses

To test the two hypotheses, this section discusses the regression results of fixed effect model that determines the impact of credit risk and liquidity risk on profitability of private commercial banks in Ethiopia. To examine the relationship between profitability measure of ROA with its explanatory variables *LLPR, CATAR, CAR, DTAR* and *lnTA*, fixed effect model was appropriate using Hausman test. In addition to this, since the sample coverage constitute the entire population of all private banks, fixed effect model (FEM) is also more plausible.

Table 5: Fixed Effect Panel Model Result

```
. xtreg ROA LLPR CATAR CAR DTAR lnTA,fe

Fixed-effects (within) regression              Number of obs      =          80
Group variable: BankCode                       Number of groups   =          16

R-sq:                                          Obs per group:
    within  = 0.4033                                        min =           5
    between = 0.2344                                        avg =         5.0
    overall = 0.2398                                        max =           5

                                               F(5,59)            =        7.98
corr(u_i, Xb)  = -0.7171                        Prob > F           =      0.0000
```

ROA	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
LLPR	-.5210876	.1877888	-2.77	0.007	-.8968521	-.145323
CATAR	.0589738	.0261855	2.25	0.028	.0065766	.1113709
CAR	.2267037	.0638256	3.55	0.001	.098989	.3544185
DTAR	-.00414	.0166308	-0.25	0.804	-.0374181	.0291381
lnTA	.0004837	.0039686	0.12	0.903	-.0074574	.0084248
_cons	-.0033977	.0548156	-0.06	0.951	-.1130834	.106288

sigma_u	.01235511		
sigma_e	.01033742		
rho	.58821694	(fraction of variance due to u_i)	

```
F test that all u_i=0: F(15, 59) = 2.33                    Prob > F = 0.0108
```

Source: Research STATA output, 2017

Based on the above fixed effect model estimation result the model representation becomes as follow:

$$ROA_{it} = \beta_0 + \beta_1 LLPR_{it} + \beta_2 CATAR_{it} + \beta_3 CAR_{it} + \beta_4 DTAR_{it} + \beta_5 \ln TA$$

$$= -0.0034 - 0.521 LLPR_{it} + 0.0589 CATAR_{it} + 0.2267 CAR_{it} - 0.004 DTAR_{it} + 0.0005 \ln TA$$

The higher R is, the closer the estimated regression equation fits the data. R^2 lies between 0 and 1, the closer the value to 1, the better the overall fits. R^2 between the variables equal to 0.4033 which mean 40.3% of the variation in the dependent variable can be explained by variation in the independent variables. The remaining 59.7% of changes was explained by other determinants which are not included in this model.

P-values evaluate how well the sample data support the argument that the null hypothesis is true. It measures how compatible our data are with the null hypothesis or how likely is the effect observed in our sample data if the null hypothesis is true. A p-value represented by significance level (alpha) suggests that our sample provides enough evidence that we can reject or accept the null hypothesis (H_0) for the entire population. The alternative hypothesis (H_1) is the opposite of the null hypothesis. This is the hypothesis we do the research for. Most authors refer to statistically significant as $p < 0.05$ and statistically highly significant as $p < 0.001$. If our p-value is less than the chosen significance level then we reject the null hypothesis that means our sample gives reasonable evidence to support the alternative hypothesis.

The test statistics value of F-test with p-value of 0.000 which is less than 0.05 refers that all the coefficients in the model are different than zero, thereby the model is appropriate.

The coefficient of Currant Asset to Total Asset ratio (*CATAR*) and Capital Adequacy (*CAR*), against ROA had statically positive significant relationship to explain the dependent variable (ROA). This indicates that for every additional unit of *CATAR* the expected number of profit (*ROA*) increases by 0.058 on average holding other variable constant. For every additional unit of CAR the expected number of profit (*ROA*) increases by 0.221 on average holding other variable constant. This shows that CAR more significantly affect the bank's profitability (*ROA*) than *CATAR*. Whereas, Loss Loan Provision ratio and Deposit to Total Asset ratio

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exhibited negative significant relationship with *ROA*. This means *LLPR* and *DTAR* are inversely related with *ROA*, for every additional unit of *LLPR* the expected number of profit (ROA) decreased by 0.52 on average holding other variable constant. When *DTAR* increased by one unit ROA will decrease by 0.004 on average holding other variable constant.

Hypothesis testing result

Hypothesis 1: Impact of Credit Risk on Financial performance of Ethiopian private banks;

H_0: Credit risk does not significantly affect the financial performance of Ethiopian private banks.

H_1: Credit risk significantly affects the financial performance of Ethiopian private banks.

In the previous section, regression analysis shows that the p-value for *LLPR* is 0.007, i.e. Loss Loan provision ratio exhibited negative and statistically significant effect on Return on Asset. The p-value is .007 which is less than the tabulated value α (.05). Therefore the null hypothesis (H_o) should be rejected in favour of accepting the alternative hypothesis (H_1). Hence, we can conclude that *LLPR* as indicator of credit risk has significant effect on the financial performance of Ethiopian private banks which is denoted by ROA.

Loss loan provision has a negatively significance effect on Return on asset, we can deduce that there is a significant negative relationship between Credit Risk and financial performance of Ethiopian private commercial banks.

Hypothesis 2: Impact of Liquidity Risk on Financial performance of Ethiopian private banks;

H_0: Liquidity risk does not significantly affect the financial performance of Ethiopian private banks.

H_1: Liquidity risk significantly affects the financial performance of Ethiopian private banks.

To examine the impact of Liquidity risk on financial performance of Ethiopian private banks, current asset to total asset ratio was used as indicator. From the result, it is evident that there is statistically significant relationship between Current asset to Total Asset ratio and return

on asset. The p-value of Current asset to Total Asset ratio (CATAR) is 0.028, which is less than the tabulated value 0.05. Therefore, the null hypothesis is rejected in favor of accepting the alternative hypothesis. Hence, it can be deduced that there is sufficient evidence that prove the impact of Liquidity risk on financial performance of Ethiopian private banks.

4.7 Discussion on findings

4.7.1 Impact of credit risk on financial performance of Ethiopian private banks

Loss Loan Provision ratio indicate that the ratio that the banks held as a provision to its total outstanding loan balance to cover its future loss on uncollectable loan amount. As per the regulatory bank, National Bank of Ethiopia's, directive all banks are instructed to calculate and hold certain amount of provision from their total outstanding balance of loan on every financial closing year. This provision amount is directly recorded as expense which in turn negatively affects profitability of each bank consequently. As the model of this paper revealed the coefficient of Loss loan provision ratio is -0.52, which shows the relationship between indicators of credit risk, Loss loan provision ratio, and Return on asset has a negative relationship. This simply tally and prove the actual negative relationship of Credit risk and banks' profitability.

4.7.2 Impact of liquidity risk on financial performance of Ethiopian private banks

Based on the regression table, the p-value of Current Asset to Total Asset ratio as an independent variable of Liquidity risk is 0.028 which is less than the tabulated value of 0.05 at 95% confidence. Therefore, we are able to reject the null hypothesis and found significant relationship between Current Asset to Total Asset ratio as indicator of Liquidity risk and Return on asset as indicator of Ethiopian Private commercial Banks profitability. In other words, based on our model the researcher found a positive significant relationship between Liquidity risk and Ethiopian private banks profitability.

CATAR has significant relationship with *ROA*, the sign of its coefficient can tell us something. The coefficient of *CATAR* as an independent variable of *ROA* showed +0.057, which revealed a positive relationship between CATAR and ROA. It means an increasing trend of *CATAR* will be accompanied by decreasing of liquidity risk then *ROA* also decrease. The higher

CATAR indicates the banks' higher ability to cover its current liability like deposit withdrawal from its liquid asset and repayment of short term loan. In short the bank will encounter minimal liquidity risk. Therefore, there is a positive and significant relationship between Liquidity Risk and Banks profitability, we can learn that liquidity risk and Ethiopian private banks' profit has a direct relationship.

Theoretically higher liquid asset or current asset mean higher ideal fund accumulated in the banks. The higher ideal fund means inefficiency of the bank to marginalize its profit through financing loan and earn interest income. Also the higher liquid asset means the lesser liquidity risk. In conclusion as our model identified and theoretically presented, there is a direct relationship between liquidity risk and banks profitability.

CHAPTER FIVE

5. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

This study aimed to analyse the effect of credit risk and liquidity risk on the performance of private commercial bank in Ethiopia. Balanced panel data of 80 observations from 2013 to 2017 of sixteen private commercial banks was analysed using STATA.13 statistic program. To analyse this panel data the researcher used descriptive statistics and fixed effect panel regression model. In this study secondary data was employed which was readily available from audited financial statement of respective banks. And identify the following findings.

- ➢ Descriptive analysis results revealed that their profit based on their asset and their loss loan provision is evenly distributed among private commercial banks it means ROA and LLPR slightly differ among the banks. But some variation was observed in their Current Asset to Total Asset Ratios.

- ➢ A fixed effect panel model was selected based on hausman test and the regression analysis result revealed that credit risk has significant and a reciprocal effect on ROA whereas Liquidity risk has significant but a direct effect on ROA.

5.2 Conclusions

One of the aims of this research was to investigate the effect of credit risk and liquidity risk on banks profitability. In this study bank specific factors were considered. These include loss loan provision to loans ratio used as credit risk proxy, current asset to total asset ratio as a proxy of liquidity risk, capital adequacy ratio, deposit to total asset ratio and bank size were considered as independent variables while bank's profitability measured by return on asset considered as dependent variable. The empirical findings on the panel data regression analysis of the effect of credit risk and liquidity risk on private bank performance in Ethiopia measured by return on asset for the sample period suggested the following conclusions.

The findings revealed that loss loan provision to loans ratio as credit risk proxy has a negative effect and significant at 5% on the financial performance of commercial banks in Ethiopia. This may seems unusual since one would expect a riskier business will have the bigger return. For instance, the higher the loan provision becomes, relative to the size of total loans, the riskier a bank becomes. An increase in the value of the provision for loss loans relative to total loans is an indication that the loans are becoming more difficult to collect, it becomes expense of the bank and deducted from the profit. This implies that banks can make a profit as far as they can minimize the credit risk.

The study further established the influence of liquidity risk on banks performance measured by return on asset. It can be seen from this research that liquidity risk has a positive and significant influence on profitability. As theoretical evidence show that banks with high exposure to liquidity risk made higher profits, compared with banks with low liquidity risk exposure.
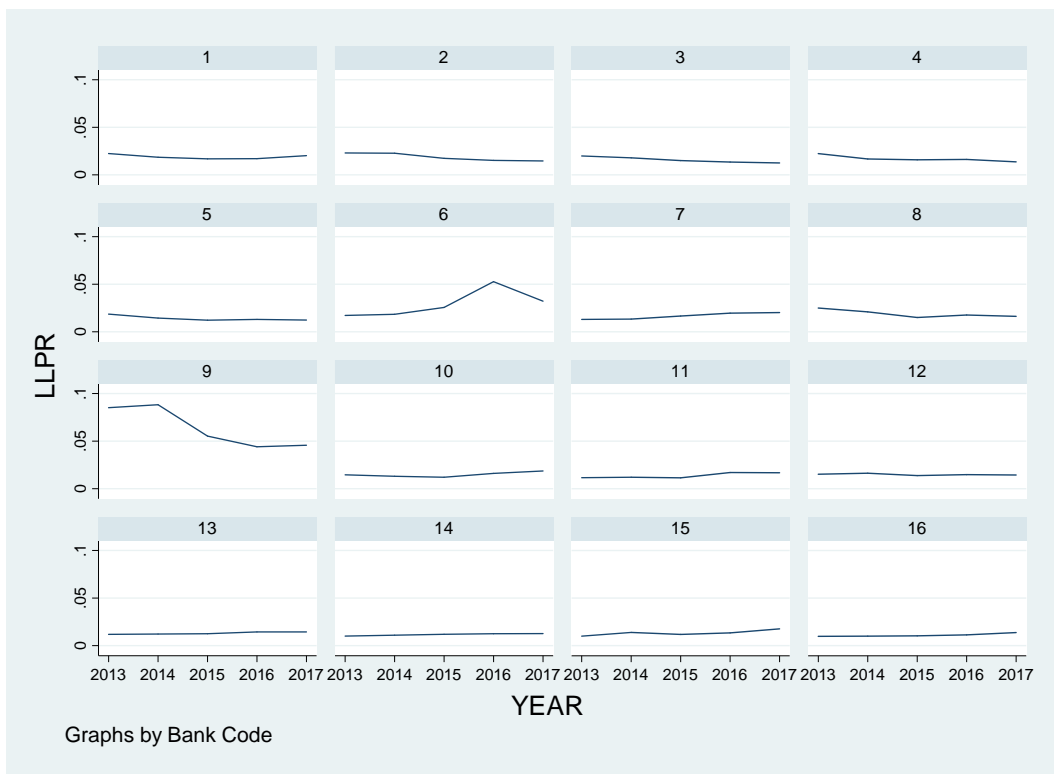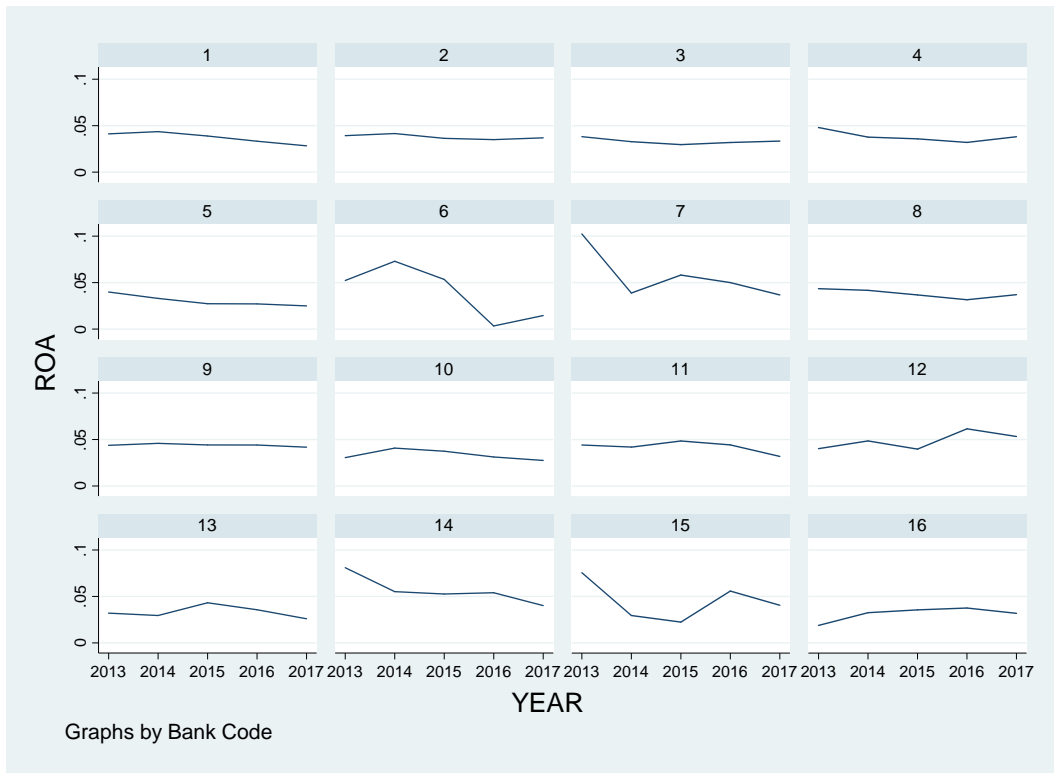
In general, the finding of the study suggest that, loss loan provision to loans ratio used as credit risk proxy, current asset to total asset ratio as a proxy of liquidity risk, capital adequacy ratio, deposit to total asset ratio and bank size were important variables that influence bank's performance.
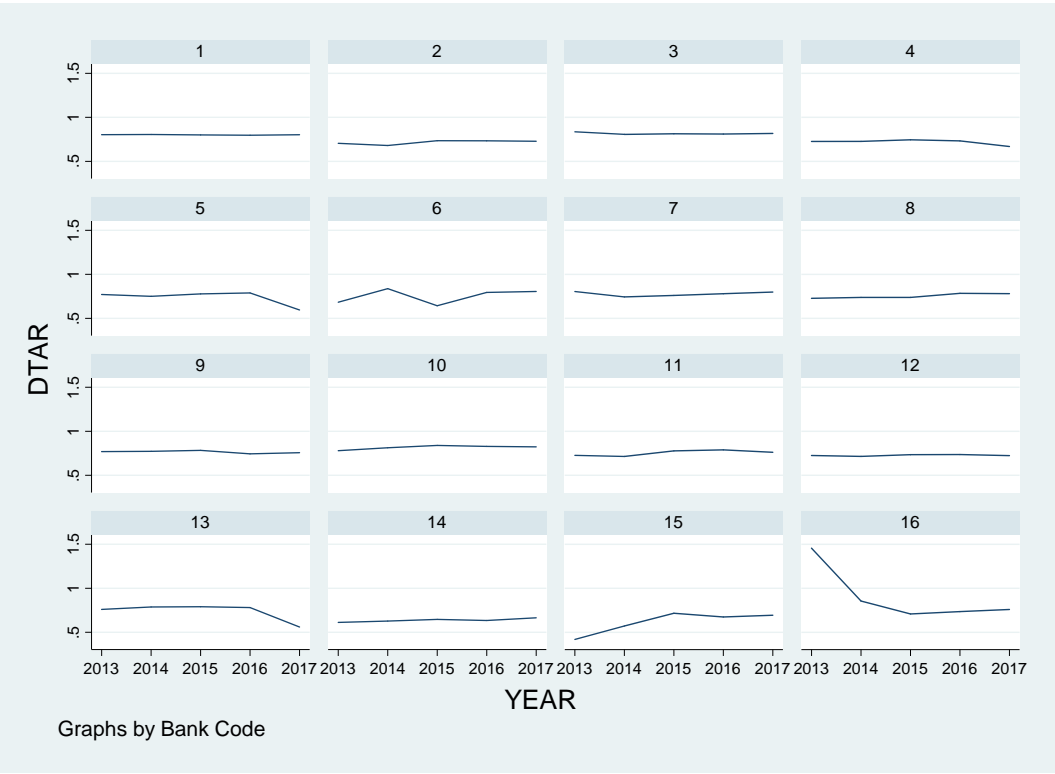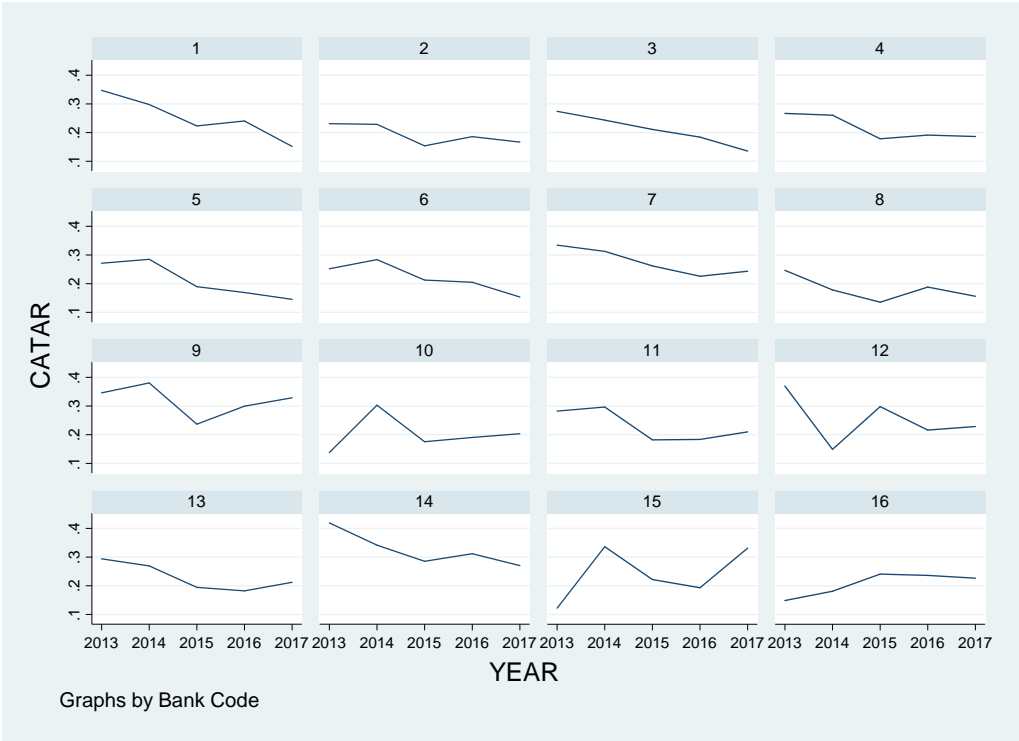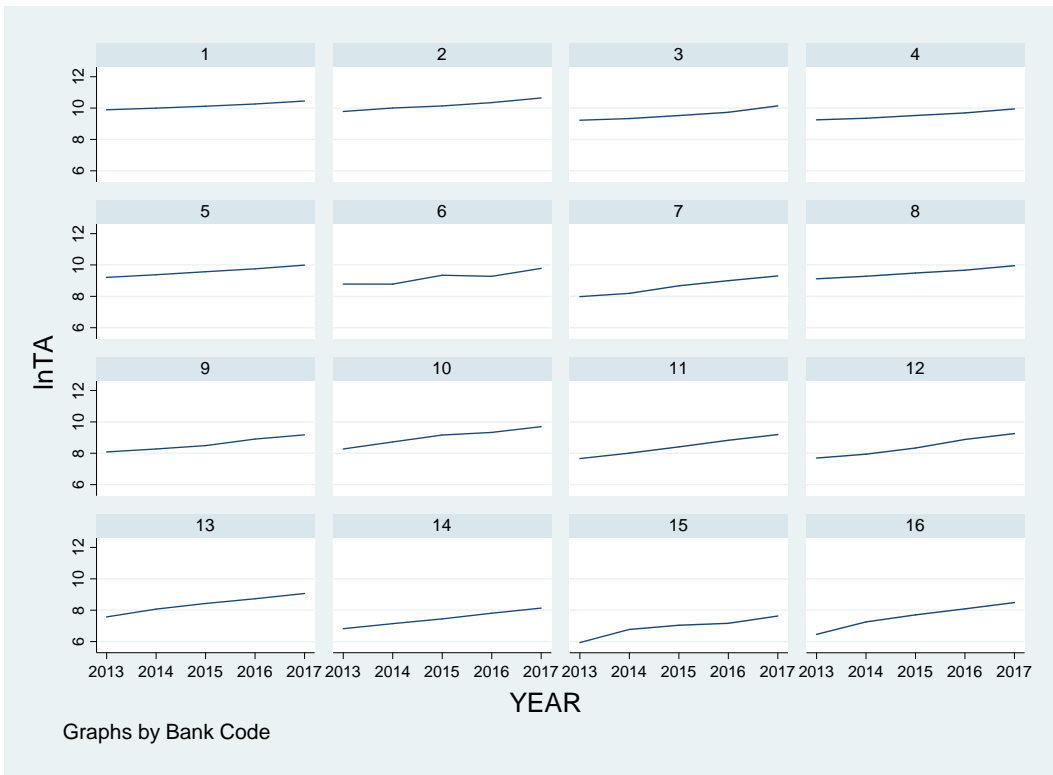
5.3   Recommendations

The purpose of this study was to explain the effect of credit risk and liquidity risk on financial performance of Ethiopian private banks. The study involved all the sixteen Ethiopian private banks operated in the study's period span 2013 to 2017 and tried to find out the relationship between the dependent variable and independent variables. In order to meet its objectives, the study raised a number of research questions and hypotheses related to the study variables. On the basis of the findings of this study the research has drawn the following recommendations:

➢ The analyses indicated that credit risk has a negative and significant effect on the financial performance of commercial banks in Ethiopia. Therefore, managers of the private banks should consider the impacts of this significant variable in determining their performance so as to maximize their profit. It is also recommended that, commercial banks should pay attention to enhance their capacity in credit analysis and loan administration to have a better asset quality as well as their loan volume. The regulatory authority should pay more attention to banks' soundness and strength than making repetitive policies and procedures.

➢ Regarding liquidity risk, the regression result suggests that liquidity risk has a positive and significant effect on the financial performance of commercial banks in Ethiopia. As the result, commercial banks should further improve their liquidity position and optimal profitability balance in order to maximize their earning subject to manageable liquidity risk.

➢ In view of National bank of Ethiopia, to minimize banks' credit risk and liquidity risk, the NBE should review the existing risk management guidelines and issue them to all banks and banks should be required to produce risk management programs acceptable to the NBE by giving due attention to credit, operational and liquidity risks.

➢ Finally, the study recommends that a further study should be done on the impact of credit risk and liquidity risk on profitability of Ethiopian private banks by including additional factors.

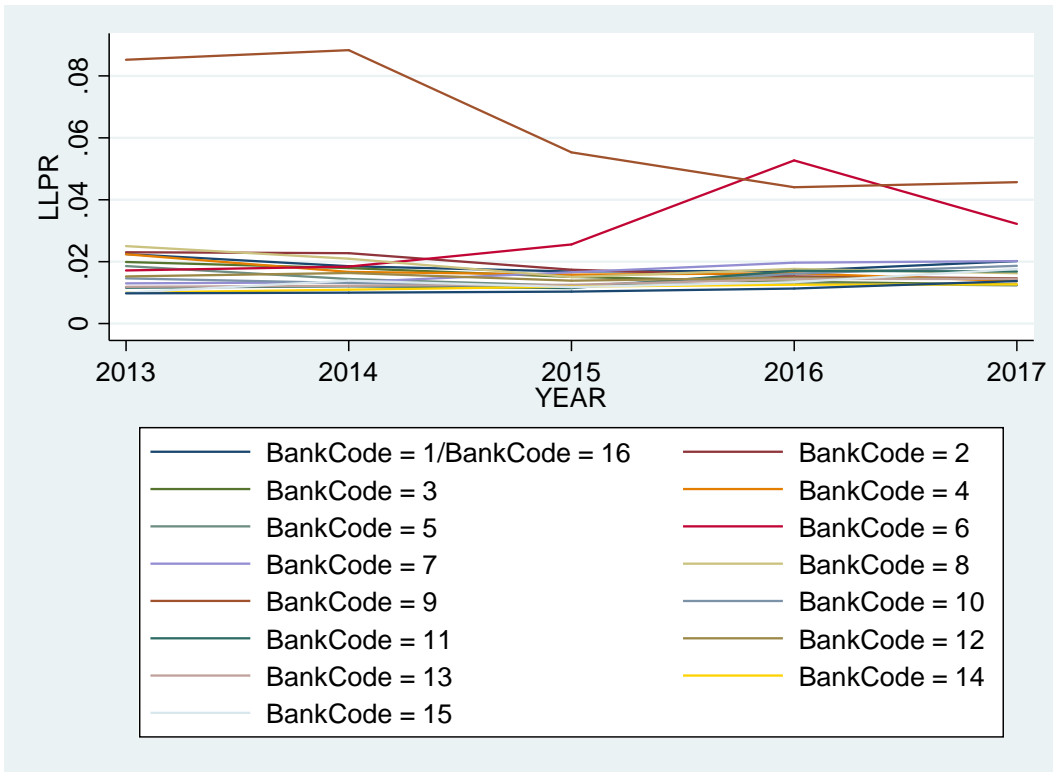**Annex I: Trend plot of variables across banks (2013-2017)**

Graphs by Bank Code

Graphs by Bank Code

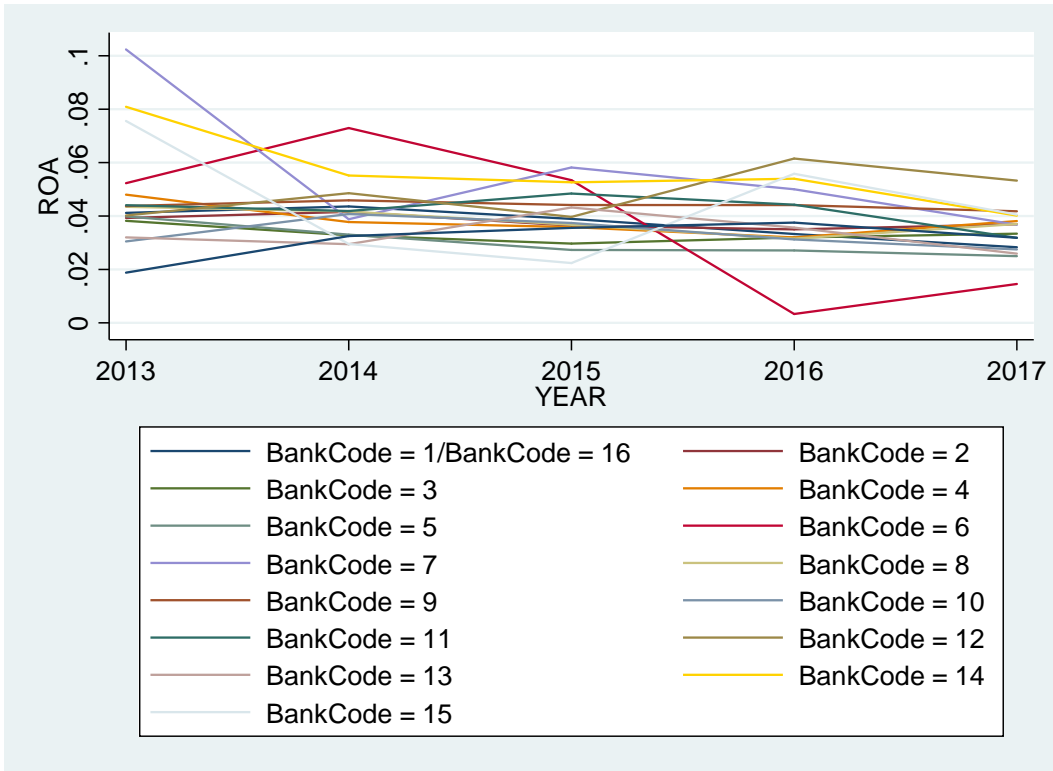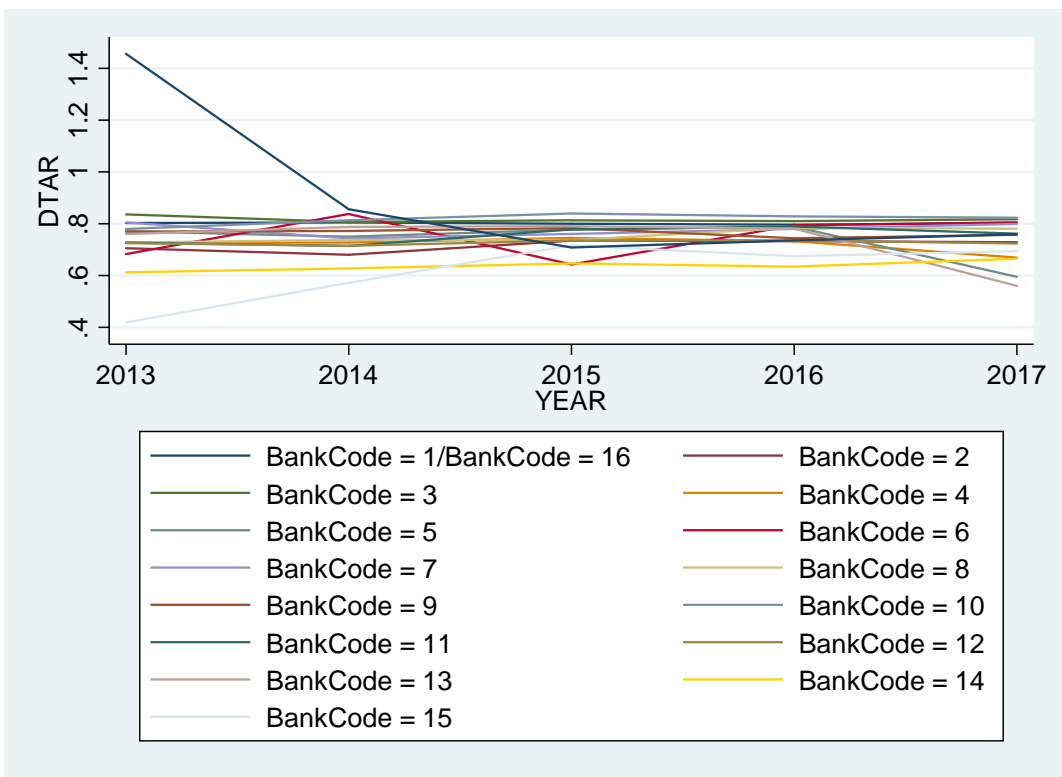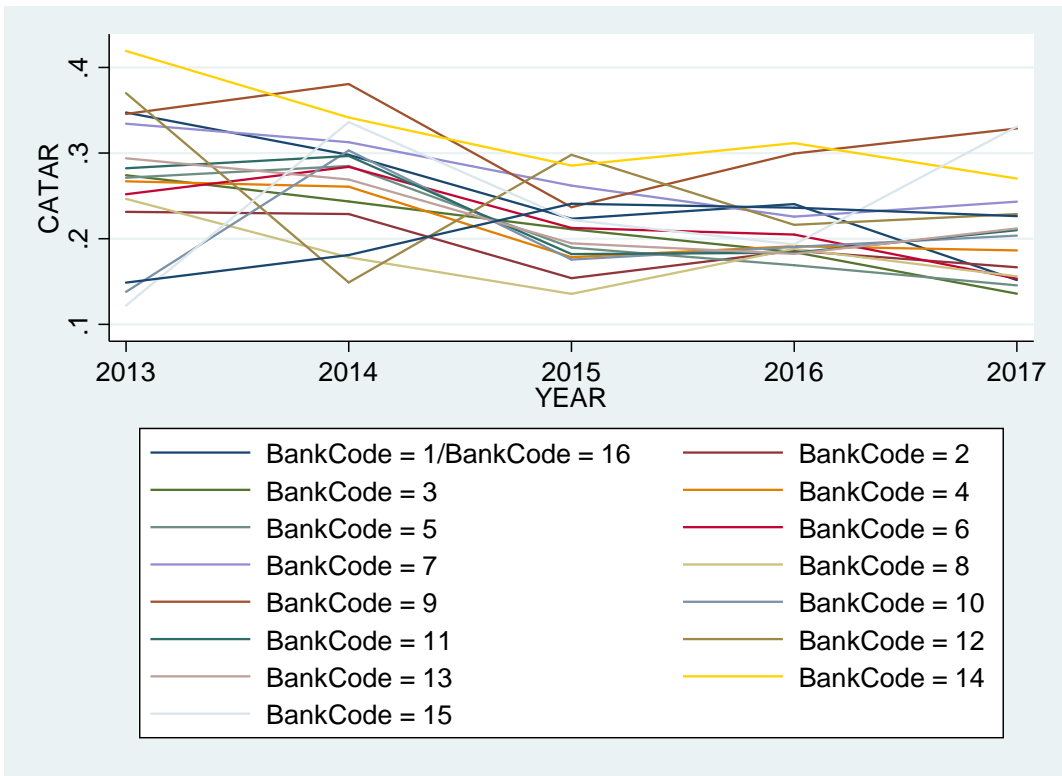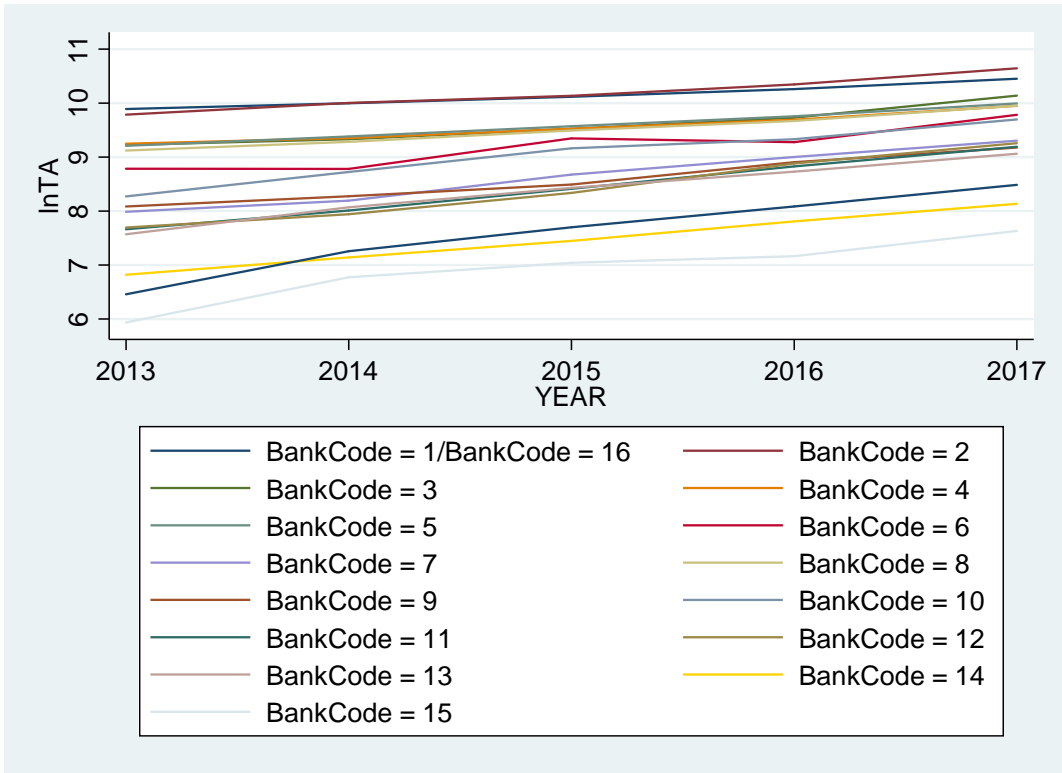Graphs by Bank Code

Graphs by Bank Code

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Graphs by Bank Code

Annex II: Overlay trend of variables for each bank (2013-2017)

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