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ADDIS ABABA UNIVERSITY
College of Business and Economics
Department of Accounting and Finance

**The Effect of Financial Risk on the Financial
Performance of Ethiopian Commercial Banks**

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**A Thesis Submitted to the Department of Accounting and Finance, College
of Business and Economics, Addis Ababa University in Partial Fulfilment
of the Requirements Degree of Master Science in Accounting and Finance**

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**Addis Ababa
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Declaration

I, Robel Abebe, hereby state that the thesis work entitled “The effect of financial risk on the financial performance of Ethiopian commercial banks” submitted by me for the award of the Master of Science degree in Accounting and Finance from the University of Addis Ababa is my original work and has never been offered at any university. All the sources and materials used for this thesis have been properly recognized.

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Certification
Addis Ababa University

This certifies that the thesis prepared by Robel Abebe entitled “The effect of financial risk on the financial performance of commercial banks in Ethiopia” presented in partial fulfilment of the requirements for the degree of Master of Science in Accounting and Finance complies with the regulation of Addis Ababa University and meets the accepted standards with respect to originality and quality.

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List of Acronyms

AB	Awash Bank
BOA	Bank of Abyssinia
BS	Bank size
CBE	Commercial bank of Ethiopia
CLRM	classical linear regression model
CR	Credit Risk
DB	Dashen Bank
EBCs	Ethiopian Commercial banks
ERR	Foreign Exchange Rate Risk
ETB	Ethiopian Birr
FEM	Fixed Effect Model
GDP	Gross domestic product
IRR	Interest rate risk
LLP	Loan Loss Provision
LR	Liquidity Risk
MoF	Ministry of Finance
NBE	National Bank of Ethiopia
NIAT	Net Income after Tax
NIB	Nib International Bank
REM	Random Effect Model
ROA	Return of Asset
SR	Solvency Risk
TA	Total Asset
HB	Hibret Bank
WB	Wegagen Bank

Abstract

This study aimed to identify effects of financial risk on the performance of Ethiopian Commercial banks over the period from 2000 to 2018. The study employed secondary data that bank detailed data were obtained from the audited financial statements of the selected Ethiopian commercial banks head office. In addition, Macroeconomic data were used from MOF. Moreover, balanced panel data were utilized in the research. Accordingly, by using purposive sampling technique only seven commercial banks out of the total of seventeen commercial banks functioning in Ethiopia were included here. Beside to this, the study used ROA as a dependent variable and liquidity risk, solvency risk, credit risk, interest rate risk, foreign exchange rate risk, GDP and bank size as independent variables. Finally, the empirical result of random effects panel data model regression revealed that liquidity risk, solvency risk, GDP and Bank size take positive effect on ROA and statistically insignificant with the exception of liquidity risk which takes positive impact on ROA as well as statistically significant impact, while credit risk has statistically significant and negative influence on the financial performance (ROA) of the Ethiopian commercial banks providing interest rate risk and foreign exchange rate risk statistically insignificant and negative influence on ROA. As a result, Ethiopian commercial banks should evaluate the borrowers' historical and projected cash flows and adequate collateral margins in order to improve financial performance, need to come with credit policies and devise strategies that not only limit the banks' exposition to credit risk but also establish a proper credit risk management strategy, should have optimal level of liquidity which enables to meet their contractual commitments and should device rigorous policies and measures with appropriate fiscal and monetary policies must be applied to control risks in an economy.

Keywords: Financial risk, performance, commercial banks, interest rate risk, liquidity risk, Foreign exchange risk, GDP, Bank size and credit risk

1. INTRODUCTION

This chapter deals with introduction of the study, Statement of the problem, the objectives of the study, hypothesis of the study, significance of the Study, scope of the study and limitations of the study.

1.1. Background of the study

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. Managing risk is one of the basic tasks to be done, once it has been identified and known. The risk and return are directly related to each other, which means that increasing one will subsequently increase the other and vice versa. And, effective risk management leads to more balanced trade-off between risk and reward, to realize a better position in the future (Fatemi and Fooladi, 2006).

Financial institutions play significant role for economic development of nations in general and of developing countries like Ethiopia in particular, where the financial system as a whole is bank dependent due to poor development or even absence of the stock market. Banks are one of the deposit taking financial institutions that play pivotal role for financial stability and are also engines for economic development of a given nation (Al KarimandAlam, 2013). One of the principal objectives of the financial institutions, particularly the banking sector is mobilizing resources from those who have excess supply especially in the form of saving deposits and channelling these funds to those who are with financial constraints, at the same time with productive investment opportunities.

According to Zawadi (2013), a healthy financial system of banks is the guarantee not only for depositors but also for all stakeholders who directly or indirectly are affected with banks' operation such as: shareholders, employees, investors, depositors, government and the whole economy at large. As a means to boost the confidence of these stakeholders, efforts have been exerted to assess the determinants of financial performance of financial institutions in general and the banking sector in particular by various researchers.

Risk management is a process of identifying loss exposures faced by an organization and selecting the most appropriate techniques for treating such exposures (Rejda, 2003). There

are many techniques available for companies to manage risks. These include: loss financing, risk avoidance and loss prevention and control (Arif et al., 2015).

Managing risks is an important factor which companies must attend to if they are to achieve financial performance. Companies apply various techniques to manage risks. The companies also guide clients on how to minimize and prevent losses (UIC, 2000). However, these techniques have not been rightly applied.

Risk is inherent in every business, but organizations that embed the right risk management strategies into business planning and performance management are more likely to achieve their strategic and operational objectives (Adrian, 2014).

During the last ten years financial institutions and investors experienced increased volatility in the major and financial commodity markets, with many financial crises. The technological revolution resulted in changes in the operation of markets, increased access to information, changes in the types of services available to investors and major changes in the production and distribution of financial services (Crouhy et al., 2006). Therefore, financial institutions and modern businesses concerned with their ability to manage risks and see the need for sound programs of risk management as an essential part of corporate responsibility (Adrian, 2014).

According to Jacques et al. (1997) financial risk encompasses the risk of cash insolvency. However, this notion will be expanded to include the risk of being unable to meet prior claims with the cash generated by the firm, which is determined by the dispersion of net cash flows and the level of fixed obligations, as well as the firm's pool of liquid resources.

Barges (1963) defines financial risk to be the added variability of the net cash flows of the owners of equity that results from the fixed financial obligation associated with debt financing and cash leasing. Financial risk is an umbrella term for multiple categories of risk associated with financial transactions. It can further be explained as the possibility where the investors lose money if they are investing in the bank whose cash flows are inadequate to meet the matured obligations (Arif et al., 2015). Thus, the major concern of this study will to examine the effect of financial risk on performance of Commercial banks in Ethiopia.

1.2. Statement of the problem

The economic improvement of any nation hinges on the presence of an effective financial system. What is stated above is likely because it is the financial system that could provide inputs for the production of goods and the provision of services which, in turn, will affect the standard of living of nations. The financial system is a complex system residing of financial institutions, markets and financial instruments. The main role of a financial system is to grease machinery facilitating economic operations. The banking system has an important role to play in transferring funds from savings units to investment units. If a financial system is effective, it should show enhancements in profitability, growing the volume of funds that range from economic to borrowers, and sound services for clients (Levine et al., 2000).

Financial intermediation delivered by the banking sector favours economic stepping up by converting deposits into productive investments (Levine et al., 2000). A bank is a financial institution that delivers banking services and other financial services to its customers. Overall, a bank is assumed as an institution providing basic banking services, such as accepting deposits and lending credits. There are also non-bank institutions that provide certain banking services without fulfilling the lawful definition of a bank. All banks safeguard money and valuables and provide credit, credit and payment services, such as checking accounts, money orders and cashier's checks. Banks also offer investment and insurance products. Banks as financial institutions, especially, deliver a exclusive role in an economy through the suppression of savings and investment activities. Obviously, the banking sector turns as a dynamic force to advance contemporary trade and trade for specific companies and traders (Melaku, 2016). On the other hand, in Ethiopia the financial sector is quiet locked and is far less developed equated to sub-Saharan countries Habtamu, (2013). At the present time, the study of the performance of commercial banks turns into very essential for their profitable continued existence. The survival of commercial banks in this dynamic economic context depends very much on their good performance based on scientific research. Hence, its good fortune and fruitful functioning capture the interest of different scholars and experts.

Numerous researchers studied the determinants of bank performance in a number of countries throughout the world. Such as Nassreddine et al. (2013) for Tunisian banks, Okoth, V & Gemechu, B, (2013) for Kenyan banks, Ezra (2013) for SSA banks, Tan & Floros (2012) for China of banks Sarita. et al, (2012) for banks in Indonesia, Dietrich & Wanzenried, (2009) for banks in Switzerland, Sufian F., (2011) for Korean banks, Sufian & Shah (2009) for

Bangladesh banks and others conducted studies on the bank's economic performance. Even if all these and other researchers conducted a study on this area, the determinants of financial performance have been debated for many years and have not yet been resolved in the corporate finance literature. Studies show, there are No universally accepted findings on what determines the financial performance of the banking sector, as countries vary among themselves in their economic systems, financial systems, political systems and operational environments. As for our country, several studies have been carried out in Ethiopia on the performance of determining commercial banks such as Habtamu N., (2012); Tigist of 2014); Amdemikael (2012); Belayneh (2011); Rao and Tekeste 2012); Tesfaye (2013); Enyew (2013); Damena (2011); Birhanu (2012); Samuel (2015) and Dawit (2016) fact on the determinant of profitability in banks. However, Damena (2011), Rao & Tekeste (2012), Birhanu (2012) and Amdemikael (2012) did not include credit risk, solvency risk, interest rate risk and exchange rate risk. In addition, Belayneh (2011) did not include solvency risk, liquidity risk and exchange rate risk. In addition, Tesfaye (2013) and Dawit (2016) did not include interest rate risk, credit risk and exchange rate risk. Finally, Enyew (2013) Samuel (2015) did not include interest rate and credit risks.

Rao & Tekeste (2012); Tesfaye (2013), Enyew (2013) and Samuel (2015) provide that liquidity has had a significant negative impact while Dawit (2016) and Amdemikael (2012) imply that liquidity has had an insignificant impact on the performance of Ethiopian commercial banks. On the contrary, the finding of Sanl and Heng (2013) means that liquidity has had a positive impact on the performance of commercial banks. Meselech (2019) noted that interest rate risk and the risk of exchange rates have statistically significant effects and a positive influence on financial performance, although credit risk has a significant and negative statistical influence on the financial performance of the Ethiopian commercial bank.

As described above, not only previous empirical results in different hemispheres of the world, but also previous Ethiopian studies indicate different results while using the same variables to examine the determinants of commercial banks' performance. This displays that there is no agreement in the banking documentation on the contributing factor of the bank's performance. In addition, none of the above Ethiopian banking performance studies includes GDP and bank size simultaneously. In addition, the previous Ethiopian studies listed above have been carried out on the determinant of the profitability of the Ethiopian commercial bank. However, not all of these researches focused primarily on the effect of financial risk on

the performance of Ethiopian commercial banks, with the exception of Meselech (2019). As a result, due to the seriousness of the problem of financial risk and the lack of empirical studies on Ethiopian commercial banks related to this subject, critical integration of financial risk variables such as interest rate risk, bank size, GDP and others are motivated by the researcher to examine the impact of financial risk on the performance of Ethiopian commercial banks from 2005 to 2018. Finally, this study not only fills the gap in the literature, but also attempts to answer the following question. What financial risk factors impact the performance of Ethiopian commercial banks?

1.3. Objectives of the study

1.3.1. General objective

The overall objective of the research is to analyse impact of financial risks on the performance of Ethiopian Commercial banks (EBCs).

1.3.2. Specific Objectives

In addition, under the main objective above, the study has the following specific objectives:

1. To explore the influence of credit risk on the performance of Ethiopian Commercial banks.
2. To find out of liquidity risk on the performance of Ethiopian commercial banks.
3. To examine the effect of risk of solvency on the performance of Ethiopian commercial banks.
4. To analyse the effects of foreign exchange rate risk on the performance of Ethiopian commercial banks.
5. To examine the consequences of interest rate risk on the performance of Ethiopian Commercial banks.

1.4. Research hypothesis

In several quantitative studies, authors used research questions. Nevertheless, a similarly right statement of studies makes use of hypotheses. These hypotheses are forecasts approximately the finishing effects, and that they are probably written as alternative hypotheses pointing out precise effects to be likely. They additionally can be said with inside the null form, representing no predicted variance or no affiliation among individuals on a dependent variable (Creswell2009). Therefore, so that you can acquire the objective of the study, the

subsequent hypotheses have put concerning the impact of financial risk at the overall performance of Ethiopian commercial banks primarily based totally on distinct empirical studies and theoretical reviewed made.

H1: Liquidity risk has a positive and significant impact on the performance of Ethiopian Commercial banks

H2: Credit risk has a negative and significant impact on the performance of Ethiopian Commercial banks

H3: Interest rate risk has a positive and significant impact on the performance of Ethiopian Commercial banks

H4: Solvency risk has a positive and significant impact on the performance of Ethiopian Commercial banks

1.5. Scope of the Study

The study delineates the impact of financial risk on commercial bank performance in Ethiopia and performs the exploration consuming a secondary data source. The research takes into account the performance of commercial banks over the past fourteen years from 2005 to 2018. Therefore, the study included banks registered by the NBE and operating in the Ethiopian banking sector and covering data of at least fourteen years for the period 2005 to 2018. Thus, a public bank (CBE) and six private commercial banks AB, BOA, DB, NIB, HB and WB were included in this study.

1.6. Limitations of the study

Due to confidentiality policy of the banks, the study was limited to the financial data of the banks that were officially disclosed and, furthermore, in this study the proxies used for most of the variables were expressed in terms of ratios, however, the ratio does not perfectly reveal the amount of its components and in addition, there are a number of reasons in terms of measurement for individual variables, those that were selected in the model may have some bias, since they cannot fully represent the precise measurement for the tested variable. This is due to availability of data and the nature of the ratio analysis.

1.7. Significance of the Study

Many parties will benefit from the findings that emerged from the study results and these are the following organs that will be benefited; Management: Management may be interested in identifying indicators of success and failure in order to take the necessary actions to improve the bank's performance and make the right decisions. Government: The government might be

interested in knowing which banks are operating successfully or which did not take the necessary action. To avoid a bankruptcy crisis in those banks which are failed. Investors: Investors could be fascinated with this type of study to protect their investment and guide it towards the best investment. Clients: Clients may be involved in knowing the banks' ability to pay their obligations based on banks' success indicators. The key findings of this study will be beneficial to Ethiopian financial institutions, particularly the banking industry. This study provides a good perspective for policymakers, and after studying this research, they will be able to develop an understanding of general risk management practices. It also provides insight into how risk management practices influence the financial performance of Ethiopian commercial banks. This study will be of great benefit to the manager, especially when framing risk management strategies. Academic: In addition, the study will be of great use to academia by adding information to the existing body of literature. Academics could have the chance to know the severity of the financial risk problem in Ethiopia's commercial banks, which helps students to become familiar with it and find a solution in their teaching and learning process. Additionally, this research will have an important role to play in shedding light on how to better understand which variables impact the performance of Ethiopia's commercial banks. In addition, this study will be of primary importance in providing a better ground for bank leaders, commercial experts, innovative wits and legislators. Furthermore, the research will also provide a point of knowledge as a springboard for future studies in this area for future researchers.

1.8. Organization of the study

The study conducts in to 5 chapters. Chapter one is an introduction element which background of the study, statement of the problem, objectives of the study, scope, significance and limitation of the study can be presented. Chapter 2 is an overview of literature wherein theories, empirical proof and conceptual framework have been identified. Chapter 3 contained studies method wherein research design, research approach, population, sampling method, sample size, sources of data, instruments, data analysis technique, model specification, description and operationalization of the study variables will be covered. Chapter four dealt with data analysis and Presentation. And the final chapter presents about conclusion and recommendation.

CHAPTER TWO

2. LITERATURE REVIEW

This section presents theoretic and empirical review on the effect of financial risk on Ethiopian commercial banks' performance. For that reason, the first part presented theoretical literature round different financial risks in commercial banks and also described risk management theory. Beside these, it presents the association among financial risks and banks' performance. The second part discoursed about several empirical studies. The gaps in prevailing literature described in the third part and the conceptual framework depicted in the fourth part

2.1. Theoretical literature review

2.1.1. Meaning of risk

According to Ralph (2000) Risk is defined as the existence of uncertainty about future outcomes. Risk is a vital issue in economic life since people and businesses make immutable investments in product research and development, plants and equipment, inventory and human capital, devoid of knowing whether future cash flows from these investments will be adequate to pay compensation both debtors and equity holders. If such real investments do not produce their essential returns, then financial entitlements on these returns will decrease in value

2.2. Meaning of financial risk

According to Holton (2004), financial risk is frequently described as sudden returns inconsistency or volatility, inclusive of credit risks, liquidity risks and market risks. In line with this, Kithinji (2010) additionally indicated that financial risk management practices are the activities and approaches utilized by executives to guard a commercial enterprise from credit risks, liquidity risks and market risks. Financial risk management practices are divided into 3 huge categories: credit risk practices, liquidity risk management practices and market risks.

2.2.1. Credit risk

As Anthony et al. indicated (1997) it is risky that a borrower does not comply with his obligations. The credit risk may arise either from an inability or unwillingness on the part of the borrower to perform in the pre-established contractual manner. In addition, Gerard et al.

(2001) indicated that credit risk essentially means risks that the counterparty cannot meet its commitments. Even if the counterparty manages to pay its obligations, the worth of a specified thing might decline if its rating is reduced. Therefore, commercial banks will be issue to credit risk every time changes to the economic policy framework result in changes that are unfavourable to the solvency of the financed properties. Bank loan are also subject to credit risk, which must be correctly assessed by internal ratings. When handling credit risk, commercial banks need predominantly pursue to elude the risk of deliberation (e.g. Concentration of investments in a particular investment type, low degree of portfolio diversification) and strives to diversify their investments as far as possible.

Coyle (2000) defines credit risk as losses due to credit customers' refusal or inability to pay what is owed in full and on time. It comes largely from direct loans and certain off-balance sheet products such as guarantees, letters of credit, currencies, futures markets and derivatives as well as assets held by the bank in the form of debt securities. It may take the form of a risk of delivery or settlement. Furthermore, it is vital for the bank's existence or failure because banks mostly earn their enormous profits from interest on their risks. Credit risk management is an indispensable element of an all-inclusive method to risk management and is essential to the continuing accomplishment of a commercial bank.

Credit risk is a financial risk resulting from the dependency of one bank to another (counterparty) to satisfy a responsibility as agreed (National Bank of Ethiopia, 2010). The credit risk, as defined by the Basel banking supervision committee (2001), is also the likelihood of dropping the current loan partially or totally, due to credit events (default risk). It can also be demarcated as agreed terms. Credit risk is also known as default risk, performance risk or counterparty risk (Brown ET Moles, 2012).

A bank exists not only to receive deposits but also to grant credit facilities, so unavoidably exposed to credit risk (Elena Carletti, 2006). Credit risk is, undoubtedly, the most significant risk faced by banks and the achievement of their business hinge on a precise measure and efficient management of this risk to a larger level than any other risk (Gieseche, 2004).

(Coyle, 2000) defines credit risk as losses due to credit customers' refusal or inability to pay what is due in full and on time. Credit risk is the risk faced by banks when a borrower (client) fails to meet debt obligations on the due date or due date. This interchangeably called “counterparty risk” risk is able to put the bank in distress if it is not properly managed.

Credit risk Management maximizes the bank's adjusted risk return rate by keeping credit risk exposure within an tolerable limit to provide a framework for understanding the Impact of risk management bank profitability credit (Kargi, 2011).

The main source of credit risk contains, limited institutional capability, inadequate credit policies, volatile interest rates, mismanagement, inappropriate laws, low levels of capital and liquidity, direct loans, massive bank licenses, poor credit rating, Laxity in credit assessment, bad lending practices, government interference and inappropriate central bank control (Kithinji, 2010). Credit risk is essential since the lack of a few large clients can result in large losses, which can lead to insolvency (Bessis, 2002).

According to NBE (2010) risk management guideline credit risk is the risk of financial loss, despite the realization of collateral security or property, due to the failure of a debtor to meet its obligations to the bank. The credit risk area includes the default risks associated with a bank bond portfolio (investment credit) and other fixed-income investments, counterparty risk in derivatives markets and risk of default on insured loans or debts and commercial debtors. The main risk resulting from a weakening of the credit portfolio is the depreciation of capital or liquidity. For most banks, extending credit through investment and lending activities Banks are an important part of their business. Therefore, the quality of an institution's credit portfolio contributes to the risk of borne by policyholders (liquidity) and shareholders (capital impairment).

2.2.1.1. Credit Risk Management

Hence, NBE (2010) stated that credit risk management is a main part of safe and sound business management. Noble credit risk management is to form a credit: by detecting present or possible credit risks to which the business is exposed, on or off the balance sheet, In running its investment and credit doings and in developing and implementing comprehensive and sensible credit policies to successfully cope and control these risks; developing and implementing effective credit concessions, documentation and collection procedures; developing and implementing procedures for effectively monitoring and controlling the nature, characteristics and quality of the credit portfolio; And developing processes for managing problem accounts.

2.2.2. Liquidity risk

Liargovas et al. (2008) elucidated the liquidity risk as a degree that debt obligations that are payable over the subsequent twelve months can be funded from cash or assets that will be changed into money. It is usually measured by current assets to current liabilities (Current ratio). It shows the capacity to convert an asset into cash speedily and reflects the Company's

capability to accomplish working capital when kept a normal level. A company may use liquid assets to finance its deeds contrariwise, amplified liquidity could allow a company to cope with unexpected events and meet its obligations during periods of low earnings.

As indicated by Gerald et al. (2001) the liquidity risk is the risk of not being capable to encounter disbursement liabilities when due. The liquidity of an investment is defined by the speed and that extent it can be converted into liquid. The capacity to convert this investment into liquid, however, is dependent on a number of reasons that impact the scope of liquidity risk. furthermore, to the over-all conditions of the market that necessitate the dissolution of an investment under hostile conditions, an unforeseen request for liquidity can be triggered by a credit rate of downgrade, negative advertising (justified or not) or reports of problems of other companies in the same or similar commercial sectors (Gerald et al., 2001).

Maintaining high liquidity can reduce management discipline for both subcontracting and investment operations. In addition, according to the agency's cost theory, high liquidity of assets could increase the agency's costs to owners because managers could benefit from the benefits of liquid assets. In addition, liquid assets involve a high risk of reinvestment, since the product of liquid assets would be reinvested after a relatively short period. Undoubtedly, the risk of reinvestment would put pressure on the performance of a company. In this case, it is therefore likely that commercial banks with less liquid assets outweigh those with more liquid assets. Nevertheless, the costs of the organization and the risk of reinvestment can be effectively minimized if measures are taken on proper Adams et al. (2000). Anthony et al. (1997) described the liquidity risk of a funding crisis.

As indicated by National Bank of Ethiopia (2010) operating liquidity risk management guide line or cash management covers daily cash requirements under conditions normally expected or likely impression. Strategic liquidity takes into account longer-term liquidity needs and recognizes the possibility of various unexpected and potentially unfavourable business conditions. Strategic liquidity is a key consideration in asset/liability management because of its potential effect on the ultimate profitability of the company. Liquidity is the availability of funds, or insurance that funds will be available, to honour all cash out commitments (both on and off-balance sheet) as they fall due. These commitments are generally met by cash flows, supplemented by assets easily converted into cash or by the company's ability to borrow. the

risk of liquidity increases if the cash flows of the principal and interest related to assets, liabilities and off-balance sheet items are incompatible National Bank of Ethiopia(2010).

2.2.2.1. Liquidity risk management

The following items are liquidity risk management practices that are satisfied by the NBE (2010) risk management guideline; Liquidity management is a fundamental component in the safe and sound management of companies. Strong liquidity management involves prudent asset and liability management (on and off balance sheet) to ensure that cash inflows are appropriately related to the size of cash outflows Liquidity planning assesses potential future liquidity needs, taking into account various possible economic, market, political, regulatory and other external and internal changes Planning for liquidity needs involves identifying known, expected and potential cash outflows and weighing alternative business management strategies to ensure the company has adequate cash inflows to meet these needs

2.2.3. Market Risk

Market risk is a company's exposure to the effects of changes in the value of market for those elements of the company's investment portfolio, both on and off the balance sheet, price changes may occur due to a number of factors, such as those related only to specific investments or the investment portfolio in addition, the effect of the price change is a function of the size of the investment position and the degree of price movement between the purchase date and the date of subsequent revaluation or sale, as the case may be NBE (2010)Investment portfolio management program

As explained by NBE (2010), investment portfolio management is a fundamental component of the safe and solid management of a company. Sound investment portfolio management involves prudently managing the risk / reward ratio and controlling investment portfolio risks on a variety of dimensions such as quality, portfolio concentration / diversification, maturity, marketability, type and the need to maintain adequate liquidity.

2.2.4. Foreign Exchange Risk

Foreign Exchange risk arises when a bank holds assets or liabilities in foreign currencies and impacts the earnings and capital of bank due to the fluctuations in the exchange rates (Sabri, 2011). Exchange rate can move in either upward or downward direction at any time. This uncertain movement poses a threat to the earnings and capital of commercial banks.

Direct exchange risk can be either transactional or translational. Transaction risk, as the name means that foreign currency transactions and translation risks are an accounting risk resulting from the translation of assets held in foreign currencies. The risk of exchange rates indirectly is basically emanated from economic an exposure which is reflected by the demand for bank loan and the performing bank lending.

According to Sabri (2011) the exchange risk of a commercial bank comes from its very trade and non-trade services. The commercial bank is exposed to the foreign exchange risk only up to the extent to which it has not hedged or covered its position. In some of the trade activities mentioned above (the first two activities) the first activities, commercial banks play a role on behalf of the customer and the exchange risk is transferred to the customer as the bank assumes the role of agency. The bank's third activity involves hedging and there is No risk in this as well as the bank has covered its risk by default of the exchange rate with other financial institutions using different financial instruments. Fourth one involves the risk that may result in profit or loss due to unexpected results.

Exchange rates tell us how many units of a currency can be bought or sold for one unit of another currency. Spot type is the exchange price of transactions for immediate delivery. The exchange rate applies to agreements that is now agreed but where the real currency change is not due to take place to some future date. The exchange of currencies on the future date shall be at the rate agreed in the present. Bessis (2010) defines the risk of change as an incurring in losses due to changes in exchange rates. Such a loss of earnings may occur due to an incompatibility between the value of the assets and that of the capital and the liabilities expressed in foreign currencies or an incompatibility between foreign receivables and foreign payables expressed in national currency.

The exchange rate risk occurs due to transaction risk or economic risk. The Transaction risk arises from the effects of changes in nominal exchange rates that affect the contractual cash

flows of a foreign currency company. It concerns contracts already concluded but which have not yet been settled. Thus, a company is subject to a transaction risk whenever it imports goods from or exported to another country that are subsequently paid, or when a company borrows or invests in a foreign currency or uses derivatives denominated in a foreign currency (Collier 2009). Exchange risk occurs when a bank holds foreign currency assets or liabilities and affects the bank's earnings and capital due to exchange rate changes. No one can predict what the exchange rate will be in the next period. This uncertain movement poses a threat to the bank's earnings and capital, if such a move is in an undesired and unforeseen direction.

Non-hedged position in a given currency gives rise to the risk of foreign currencies and such a Position is said to be an open position in that particular currency. If a bank has sold more currencies than what it has bought, it is said that it is Net short in this currency, and the alternative is Net Long position when sold less than bought. These two risk positions since the foreign currency may fall in value relative to the local or domestic currency and becomes a reason for a loss Important for the bank if it is in a net long position or foreign currencies can increase in value and lead to losses if the bank is naked in that currency. Net Currency exposure which is the sum of these two positions gives information on the exchange risk that was assumed by the bank at that time. This figure represents the unhedged position of the bank in all foreign currencies. A negative figure shows the net short Position while the positive figure shows the net open Position (Sounder and Cornet, 2007).

2.2.4.1. Causes of exchange rate volatility

There is a variety of factors contributing to the fluctuation of an exchange rate. These comprise the opens of an economy, domestic and foreign money supplies, the exchange rate administration, interest rates, and the freedom of the national bank and production levels, returns, price rises, and unpredictable circumstance. The grade of weight of for each of these issues differs and hinge on the economic situation of a specific nation (Stancik, 2006). The study also explained how these factors contributed to the change in exchange rates, as summarized by below.

Inflation-changes in market inflation cause changes in exchange rates. A country with an ever lower inflation rate of a has a rising currency value while a country with a high inflation rate of generally sees a depreciation in its currency and is generally accompanied by higher

rates interest. Interest rate-changes in the interest rate affect the value of the currency and the exchange rate. The in rate increases ensure that a country's currency is valued because higher interest rates give high rates to aux lenders, thus attracting more capital abroad, this causes exchange rate growth.

Balance of payment-a country with deficit in balance of payment due to spending more of its currency on importing products than it is earning through sale of exports causes depreciation. Balance of payments fluctuate exchange rate of its domestic currency.

Government debt- A country with government debt is less likely to acquire foreign capital, leading to inflation. Foreign investors will sell their bonds in the open market if the market predicts government debt within a certain country. As a result, a decrease in the value of its exchange rate will follow.

Political stability- A country's political state and economic performance can affect its currency strength. A country with less risk for political turmoil is more attractive to foreign investors, as a result, drawing investment away from other countries with more political and economic instability. Increase in foreign capital, in turn, leads to an appreciation in the value of its domestic currency. A country with sound financial and trade policy does not give any room for uncertainty in value of its currency. But, a country prone to political confusions may see depreciation in exchange rates.

Recession-When a country experiences a recession, its interest rates are likely to fall, decreasing its chances to acquire foreign capital. As a result, its currency weakens in comparison to that of other countries, therefore lowering the exchange rate.

Speculation -If a country's currency value is expected to rise, investors will demand more of that currency in order to make a profit in the near future. As a result, the value of the currency will rise due to the increase in demand. With this increase in currency value results a rise in the exchange rate as well.

Economists believe that macroeconomic fundamentals determine exchange rates in the long run. The value of a country's currency is thought to react positively, for example, to such fundamentals as an increase in the growth rate of the economy, an increase in its trade balance, a fall in its inflation rate, or an increase in its real i.e. inflation Adjusted interest rate Jeffrey (2008).

2.2.4.2 Exchange rate and bank performance

According to Popper (1996) exchange rate fluctuations affect banks both directly and indirectly. The direct effect comes from banks' holdings of assets (or liabilities) with net payment streams denominated in a foreign currency. Foreign exchange rate fluctuations alter the domestic currency values of such assets. This explicit source of foreign exchange risk is the easiest to identify, and it is the most easily hedged.

He further explained that a bank without foreign assets or liabilities can also be indirectly exposed to currency risk because the exchange rate can affect the profitability of its domestic banking operations. For example, consider the value of a bank's loan to an exporter. An appreciation of the home currency might make it more difficult for the exporter to compete against foreign firms. If the appreciation thereby diminishes the exporter's profitability, it may also diminish the probability of timely loan repayment and, correspondingly, the profitability of the bank. As the exchange rate is linked to foreign competition, to the demand for loans, or to other aspects of banking conditions; it will affect even "domestic" banks

Similarly, Mbutor (2010) mentioned that due to information asymmetries, depreciation of the exchange rate could cause a decrease in credits in two different ways. First, if that depreciation worsens the borrower's balance sheet, then the default risk will be large and the banks will move away from lending. On the other hand, if banks are exposed to short-term liabilities in foreign currencies, then such liabilities will be extended depending on the extent of the depreciation of the local currency and any other associated cost, thus mitigating its potential to create credits.

2.2.4.3. Commercial banks Foreign Exchange Risk Management

Banks can manage their foreign currency risk in different ways. One of the techniques that can be used to reduce foreign currency risk is hedging. In this way, a bank eliminates or minimizes its risk. Hedging can be done in different ways:

Foreign currency risk of assets and liabilities: It is a hedging technique used by commercial banks to match their assets and liabilities in foreign currencies to ensure a profitable spread by trading in foreign currency. There are several types of foreign currency derivatives: a. Foreign Currency Futures B. Foreign currency swaps c. Foreign currency options d. Foreign currency futures contracts

Hedging through Diversification of Foreign Asset-Liability Portfolio: It is a hedging technique by which commercial Banks try to mitigate the foreign currency risk on its individual currency by holding multicurrency Asset-Liability Positions. Holding assets and liabilities in various foreign currencies does not reduce the risk of the portfolio of assets and liabilities of a bank alone but also significantly lower the cost of capital. The main reason for this is the differential inflation and interest rates in different countries. Almost all commercial banks hold such type of multicurrency asset-liability portfolios Sabri (2011).

2.2.5. Solvency risk

As defined by AARDLB (2010), solvency is defined as having sufficient value in the form of assets in your company to cover all of the company's liabilities. Based on the accounting equation that $\text{assets} = \text{liabilities} + \text{equity}$, this definition means that a company has When the capital stock of a company becomes negative, it is said to be insolvent. Bankruptcy is almost the corner of an insolvent business if it doesn't generate enough cash flow income to meet its debt requirements in a timely manner.

2.2.6 Interest rate risk

Lending Interest Rate: The real interest rate is expected to have a positive relationship with profitability in the essence of lend-long and borrow-short argument (Vong and Hoi Si Chan, 2008). That means banks may increase lending rates sooner by more percentage points than their deposit rates. On the other hand, the rise in real interest rates may increase the real debt burden on borrowers and this may lower asset quality, thereby interest rate may have a negative impact on profitability.

According to Ogunleye (2001), an increase or decrease in interest rates by adjusting revenues affects the profits of banks. Empirical evidence from Molyneux and Thornton (1992) shows that a high interest rate is significantly associated with higher bank profitability, i.e. a significant positive relationship. In contrast, Naceur (2003) highpoints an inverse association among interest rates and bank performance. This ambiguity is a realistic reasoning for extra empirical investigation.

Alper and Anbar (2011) examined limited to banks area and the economy at large determining factor for performance of commercial banks in Turkey dated 2002-2010. The research practices mutually return on investment (ROA) and return on equity (ROE) by way of a substitution for bank performance. Using balanced panel data and a fixed effects model, the outcome displays that merely actual interest proportion is similarly related to profitability in terms of macroeconomic variables. In other words, an incremental easing of real interest

rates, which is influenced by an increase in inflation rates, would lead to an increase in the profitability of commercial banks in Turkey. Bern (2010) examined that countries with higher inflation observe a devaluation of their currency in relation to the currencies of their trading partners. This is also often accompanied by higher interest rates that result in a positive relationship between inflation and bank performance.

2.2.7. Growth rate of Economy

The GDP which is the growth rate of the economy is amid the utmost usually used macroeconomic indicators, as it is a degree of whole economic activity inside an economy. Growth domestic product per capita is anticipated to have a constructive influence on bank performance, based on well-documented literature on the association between economic growth and financial sector performance

2.2.8. Bank size

The studies carried out on the determinants of bank profitability took the variable bank size, considered as an important determinant of banking performance Kosmidou (2008). If the relative size of a firm expands its market power and profits increase, this is the market power (PM) hypothesis, also known as the structure, conduct, and performance (SCP) hypothesis Athanasoglou et al. (2005).

The various studies on bank size produced mixed empirical results. Some studies found economies of scale for big banks Athanasoglou, (2006) for Southeaster European banks and Kosmidou, (2008) for Greek banks and others concluded that the economies of scale for big banks are possibly possible bureaucratic bottlenecks and inefficiencies in administration or economies of scale small banks Athanasoglou et al., (2005) for Greek banks, Aburime, (2008) for Nigerian banks and Ngo, (2006) for Australian banks. How extensive researchers pointed out the expected sign of bank size is Ambiguous. Therefore, it can be assumed that the size-profitability relationship is not linear. The researcher uses the natural logarithm of total wealth as a proxy for bank size, while the square of the natural logarithm of total wealth is included to account for any unrecorded linearity in the size-profit relationship.

According to Belayneh (2011), researches has been done on the determinants of Profitability of commercial banks carried out during the period 2001-2010 concluded that the size of all Ethiopian commercial banks, as measured by the logarithm of total assets, has increased over the past 10 years. In the case of Ethiopian commercial banks, this means that larger banks

generate the higher profit than smaller banks in the Ethiopian banking sector because they take advantage of economies of scale. In the literature, banks' asset and / or deposit base has been adopted as a proxy for their size; on occasions, their asset and / or deposit market shares have also been used; however, the second set of measures is derived from the first. Aburime's (2008) research on the Nigerian banking industry in the area of banking performance and the supervision adopted by the data envelopment analysis approach established that the profitability of larger banks is significantly higher than that of smaller banks.

2.2.8. Off-Balance Sheet Risks

As part of In their operations, banks are involved in the origination of financial contracts that may result in the acquisition of assets and liabilities at a future date, under certain conditions Generally accepted accounting principles do not consider these contracts themselves as assets or liabilities and therefore do not recognize Balance sheet items are diverse in nature and purpose and may include letters of credit (L / C), unused loan commitments, guarantees, acceptances and performance bonds .

Off-balance sheet business for banks means exposure to various risks the bank must have a basic understanding of the risks associated with off-balance-sheet business which, in principle, are no different from on-balance sheet business and should in fact be considered as an integral part of the bank's overall risk profile. The main risks associated with off-balance-sheet businesses are summarized below: Off-balance-sheet activities can reduce or increase exposure to exchange rate fluctuations. When managing foreign exchange risk, banks must constantly monitor their foreign currency positions, whether they arise from off-balance sheet or on-balance sheet businesses. Also, some individual transactions can be made to increase net interest rate exposures. In such cases, this can lead to an increase in the interest rate, as well as the credit risk. Measurement and control of interest rate risk requires banks to conduct sensitivity analysis so that management can estimate the effect of a given change in Liquidity can be the threat that a bank may not be capable of getting the essential funds to encounter its obligations as they become due, that is, deposits to maturity, transfers under approved facilities. Obtaining funds from the market at competitive rates that can send the wrong signals that the bank is facing serious interest rate problems. Credit risk is the risk that one or more counterparties will default on their obligations on and off the balance sheet Guarantees, letters of credit not covered in cash. To explain the relationship between the profitability of banks and the financial risks discussed above, it is first necessary to discuss the profitability

of banks and its measurement, then in the next section the theoretical explanation related to the profitability of banks and their Measurement.

2.3 The profitability of banks and its measurement

Commercial banks make a profit by making more money than they pay for expenses and taxes. The best essential amount of a bank's incomes originates from the payments it charges aimed at its services and interest you earn on your assets .Your main expense is interest. Loans dominate asset holdings in most banks and generate most of operating income Loans are the dominant asset in most bank portfolios, comprising 50 to 70 percent of total assets (Claudiu and Daniela (2009).

Key assets of a bank remain its credits to people, companies and other organizations and the securities it owns, whereas the highest liabilities are its money put by customer and the money it borrows, either from other banks or by sales of commercial paper on the money market. Return on Assets (ROA) and Return on Equity (ROE) are the ratios commonly used to measure the profitability of a business. Businesses use assets to generate income. Loans and securities are assets of a bank and are used to provide most of the income of a bank; However, to make loans and buy securities, a bank must have money, which comes primarily from the bank's owners in the form of bank capital, from depositors, and from money it borrows from other banks or through the sale of securities. Banks purchases assets mainly through moneys attained from its liabilities. Conversely, not all assets can be used to create revenue, for the reason that banks need to have cash to satisfy client cash-out requests. ROA is determined by the amount of commissions you earn for your services and your income net interest. The measurement of banking performance has developed over time. In the beginning, many banks used a purely accounting approach focused on measuring net income, for example, calculating ROA. However, this approach does not consider the risks related to the referred assets, for example, the underlying risks of transactions, and also with the growth of off-balance-sheet activities, so the risk of the underlying assets becomes increasingly more important banks note that capital has become the scarce resource. Therefore, banks focus on ROE to measure net profit to equity in order to find the most profitable business and make the investment Gerhard. S (2002) cited in Ara et al. (2008) .

The margin index Net Interest Rate (NIM) is also used to measure bank profitability in the baking literature Studies exploring the factors influencing bank profitability use one or a

combination of these indices alternatively as measures of bank profitability in their analysis. The ratios (net profit over total assets, net profit over equity and NIM) instead of the real value of profits are used to measure bank profitability because the ratios are not conditioned by variations in the general price level. Rates are invariant over time; the real value of earnings can be affected by changes in inflation rates over time. That is, the ratios are invariant in time because both the numerator and the denominator in period t would be measured in monetary terms based on the price levels of period t (Guru et al. (1999)).

2.4 The Relationship between Risks Financials and Profitability

Risks are generally defined by the hostile influence on revenue of numerous diverse sources of improbability. Similarly, common to claim that the anticipated return on an asset ought to be positively associated to its risk. That is, people will hold a risky asset only if its expected return offsets. Both the capital asset valuation model (CAPM) developed in the early 1960s such as arbitrage pricing theory (APT) imply a positive relationship between expected return and risk. Even the APT views risk more generally than just the standardized or beta covariance of a security with the market portfolio. The relevant risk of an individual stock, which is called its beta coefficient, is defined in the CAPM as the amount of risk that the stock contributes to the market portfolio and the CAPM establishes that the expected returns of the shares should be related only to beta, which represents market risk or systematic risk; Standard asset pricing models also imply that arbitrage must ensure that riskier assets are rewarded with higher returns.

The basic concepts of the CAPM were developed specifically for common stocks and the fundamental assumptions for positive risk-return. The trade-off is that investors are risk averse and therefore investors demand compensation for taking the risk. Any investor can lend and borrow an unlimited amount at the risk-free interest rate. There are no taxes or costs of transaction, and that all investors have access to the same information at the same time. However, in reality, every investor has a credit limit, and actual financial products are subject to both taxes and transaction costs, and taking them into account will alter the CAPM's offset assumption of higher risk for higher return.

An alternative to the CAPM, called arbitrage price theory (APT), has been developed more recently. The differences between the two models are derived from the APT's treatment of the interrelationship between security returns. The APT assumes that the returns on securities are

generated by the correlation between a pair of securities occurs when these two securities are affected by the same factor or factors. On the contrary, although the CAPM allows the correlation between values, it does not specify the underlying factors causing the correlation (Wang et al., 2012).

CAPM is widely used by analysts, investors and corporations; however, despite the intuitive appeal of the CAPM, several studies have raised concerns on its validity. In particular, a study by Fama and the French doubt on the CAPM. Fama and French (1992) found two variables that are consistently related to stock returns: (1) company size and (2) market / book ratio. Adjusted for other factors, they found that smaller companies had relatively high returns and that the returns on stocks with low market / book ratios are relatively high. At the same time, and in contrast to the CAPM, they found no connection between the beta of a share and its return (Jaffe 2003).

The main source of income or core sources of profit of the banks were the lending to their customers. This means that risk is an intrinsic component of banking and that incomes are, in part, the incentive for effective risk holding. In contrast, undue, ill managed risk can lead to distress then failure of banks. The main reason for adopting risk management practices is to avoid the likely failure in the future. In real terms, however, risk management is clearly not free. In fact, it is expensive both in terms of resources and institutional costs, but the cost of delaying or avoiding proper risk management can lead to some adverse outcomes, such as the failure of a bank and possibly the failure of a banking system Meyer (2000).

2.5. Review of Empirical studies

The study has reviewed various empirical studies that are related with the effect of financial risk on commercial banks' performance by incorporating various empirical studies conducted in developed countries, emerging market countries and African countries.

The effect of financial risk on the financial performance of commercial banks Enyew (2013) conducted research on the financial risks and profitability of commercial banks in Ethiopia. The study included only eight commercial banks for twelve consecutive years (2000 to 2011). The study used data from secondary sources that were collected from NBE on the banks' audited financial statements, selected as independent variables credit risk, liquidity risk, interest rate risk, and exchange rate risk, and as controllable variables the Size, the Bank Capitalization, the GDP Growth Rate and the Inflation Growth Rate; In addition to this, he

applied return on assets (ROA) for profitability measurement which was taken as dependable. He used panel data to perform quantitative analysis and also tested the basic assumptions model. The study found that credit risk was the main factor negatively affecting the profitability of Ethiopian commercial banks. Along with this, liquidity risk was also the main factor negatively affecting the profitability of Ethiopian commercial banks. The bank's profitability would be adversely affected by interest rate risk. However, this negative relationship was not found statistically significant even at a significance level of 10% (p -value = 0.8964). There is a negligible negative relationship between exchange rate risk and profitability. In line with this, bank capitalization was the main factor that can determine the change in profitability in Ethiopian commercial banks Profitability will rises by way of the size of banks increases, reinforcing the circumstance that greater banks enjoy upper profits than the lesser banks in the country. Gross domestic product development showed a progressive and statistically significant relationship with profit. There is an inverse relationship between inflation and the income of Ethiopian banks. Conversely, this negative relationship was not statistically significant; therefore, the results recommended that inflation was not an important factor determining the profitability of Ethiopian banks.

Alexiou and Sofoklis (2009) conducted another similar study on Greek banks to examine the effects of macroeconomic and specific determinants of each bank of the profitability of banking in Greece, supposing the dual comprehensive circles of variables (Return on asset and return on equity) curbs profitability a bank is a gathering of the definite division as an entire, along with the big economic situation in which the division operates. Using the method of panel analysis of six selected Greece banks via an empirical structure method including the old-style Structure-Behaviour-Performance proposition. The result proposes by far bank area determining issue meaningfully affected the bank's profitability; on the other hand, here is a comparatively fragile association amongst scope and profitability, and a vague image on the overall economy reasons were measured.

Sufian and Chong (2008) looks for factor that influence profitable environment of the Philippine experience return on asset as a regressed variable for fifteen years so that observed signal proposes limited to the area of banking determining factor take a statistically significant influence profitability of banking sector. Amongst, size, credit risk and overheads negative influence on income, whereas to those which are not financial income and capitalization have a positive influence on income. Regarding macroeconomic influences, the

results display that, excluding for inflation, with a negative influence on bank income, GDP, currency fund advance and the capital of market has not significantly influence profit.

Ana et al. (2011) conduct research on the topic Determinants of Bank Profitability in Croatia with twofold objectives; to provide a synthesis of relevant empirical researches on the determinants of commercial banks' profitability and to establish empirical verification of profitability determinants of Croatian banks using dynamic panel analysis under the study period 2003 to 2008 on 28 commercial banks. Return on assets (ROA) is used as a proxy indicator to measure profitability in the analysis. The result of the study reveals that higher loan growth and equity financing, stable base of deponents, prudent credit risk and market risk management as well as the growth of fee-based activities are comparative advantages of banks in Croatia in achieving extraordinary levels of return on assets. On the other hand, the average interest income and the average interest expense proved to be statistically insignificant.

Ayanda et al. (2013) search for the determinant of Nigerian Banks' Profitability in the case of First Bank of Nigeria Plc by applying the econometric analysis of Co-integration and Error Correction Technique using annual time series data from 1980 to 2010. The empirical result shows that bank size and cost efficiency did not significantly determine bank profitability in Nigeria. However, credit risk and capital adequacy had significantly negative effect on banks profitability both in the long-run and in the short run. Liquidity Risk which is, in the study, measured by Total Loans to-Total Assets ratio and Total Loans-to-Total Bank Deposits ratio have significant negative and positive relationships with profitability respectively only in the short run. On the other hand, among macroeconomic variables used in the study only money supply growth had a positively link with Nigerian bank profitability both in the long run and in the short run. However, no evidence was found for inflation rate and growth rate of real GDP determination of profitability.

Rao & Tekeste (2012), conducted the research on the topic "Determinants of Profitability of Commercial Banks in a Developing Country: Evidence from Ethiopia" employing unbalanced panel data of Ethiopian commercial banks under the period 1999/00 to 2008/09. In the study return on average asset stands for bank profitability indicators, seven internal and three external factors were regressed against ROA of the banks. The finding of the study shows that the most important determinants of banks' profitability in Ethiopia are all the internal factors used in the study: equity to asset ratio, non-interest income to total income and bank size have positive and significant impact on the profitability, the loan loss reserve to

total loans is found to have negative impact on profitability though it is statistically insignificant, liquidity and operational efficiency are also negatively affect the profitability of the banks. But the external factors (concentration, inflation and GDP) are found to be statistically insignificant. The study is different from the above one since it utilized a time period of 2003-2012.

The paper conducted by Ameer and Mhiri (2013), to identify the explanatory factors of banks' Performance on ten Tunisian commercial banks from 1998 to 2011 incorporate bank-specific, industry-specific and macroeconomic factors. The empirical result of the GMM estimator technique shows a high degree of persistence of bank performance. Thus, the findings suggest that the bank capitalization and the best managerial efficiency have a positive and significant effect on the Tunisian bank performance. However, concentration and bank size have negative a negative and a significant effect on performance. On the other hand, the macroeconomic variables do not have a significant effect on bank performance, except inflation which seems to affect negatively bank's net interest margin. Moreover, private owned banks seem to be more profitable than state owned ones.

Damena (2011) in his study examined the determinants of Ethiopian commercial banks profitability. The study applied the balanced panel data of seven Ethiopian commercial banks that covers the period 2001- 2010. The paper used Ordinary Least Square (OLS) technique to investigate the impact of some internal as well as external variables on major profitability indicator i.e., ROA. The estimation results showed that all bank-specific determinants, with the exception of saving deposit, significantly affect commercial banks profitability in Ethiopia. Market concentration was also a significant determining factor of profitability. Finally, with regard to macroeconomic variables, only economic growth exhibits a significant relationship with banks profitability.

Belayneh (2011) examined the determinants of Ethiopian commercial banks profitability. The study applied the balanced panel data of seven Ethiopian commercial banks that covers the period 2001- 2010. The paper used Ordinary Least Square (OLS) technique to investigate the impact of some internal as well as external variables on major profitability indicator i.e., ROA, the estimation results of his study show that all bank-specific determinants, with the exception of saving deposit, significantly affect commercial banks profitability in Ethiopia. Market concentration is also a significant determining factor of profitability. Finally, with

regard to macroeconomic variables, only economic growth exhibits a significant relationship with banks' profitability.

The study of Alper and Anbar (2011) focuses on the bank specific and macroeconomic determinants of Profitability in Commercial Bank of Turkey under the period 2002 to 2010. It uses ROA and ROE as dependent variables to examine the determinant of banks profitability. The finding the research reveals that asset size and non-interest income have a positive and significant effect on bank profitability. However, sizes of credit portfolio and loans under follow up have a negative and significant impact on bank profitability. With regard to macroeconomic variables, only the real interest rate affects the performance of banks positively. These results suggest that banks can improve their profitability through increasing bank size and non-interest income, decreasing credit/asset ratio. In addition, higher real interest rate can lead to higher bank profitability.

The study made by Amdemikael (2012) examined the determinants of Ethiopian commercial banks profitability. The study applied the balanced panel data of eight Ethiopian commercial banks that covers the period 2001- 2011. The study adopts a mixed methods research approach by combining documentary analysis and in-depth interviews to investigate the impact of some internal as well as external variables on major profitability indicator i.e., ROA. The findings of the study show that capital strength, income diversification, bank size and gross domestic product have statistically significant and positive relationship with bank's profitability. On the other hand, variables like operational efficiency and asset quality have a negative and statistically significant relationship with bank's profitability. However, the relationship for liquidity risk, concentration and inflation is found to be statistically insignificant.

Birhanu (2012) examined the determinants of Ethiopian commercial banks profitability. The study applied the balanced panel data of eight Ethiopian commercial banks that covers the period 2001- 2011. The paper used Ordinary Least Square (OLS) technique to investigate the impact of some internal as well as external variables on profitability indicator i.e., ROAA, NIM the finding shows, all bank-specific determinants, with the exception of bank size, expense management and credit risk, affect bank profitability significantly and positively in the anticipated way. However, bank size, expense management and credit risk affect the commercial banks profitability significantly and negatively. In addition to this, no evidence is found in support of the presence of market concentration. Finally, from macro-economic determinants GDP has positive and significant effect on both asset return and interest margin

of the bank. But interest rate policy has significant and positive effect only on interest margin.

Habtamu (2012) examined the determinants of Ethiopian private commercial banks profitability. The study applied the balanced panel data of seven Ethiopian commercial banks that covers the period 2002- 2011. The paper used Ordinary Least Square (OLS) technique to investigate the impact of some internal as well as external variables on profitability indicator i.e., ROA, ROE & NIM, the finding shows the empirical results shows that bank specific factors; capital adequacy, managerial efficiency, bank size and macro-economic factors; level of GDP, and regulation have a strong influence on the profitability of private commercial banks in Ethiopia.

Azam and Siddiqui (2012) applied multiple regression technique to analyze the internal and the external determinants of Pakistan banking industry. The study, on the purpose of comparing the profitability of domestic and foreign banks and analyzing their determinants under the period 2004 to 2010 (on quarterly basis), find that foreign banks are more profitable than all domestic banks, and they have also different profitability determinants. Empirical results show that foreign banks are less affected by the macroeconomic factors of the host country than domestic banks and they have a higher profitability margin in Pakistan. They conclude that local controlled commercial banks in Pakistan are more profitable than foreign controlled ones as far as the volume of the profit is concerned which is reflected in their earnings per share but the foreign controlled commercial banks in Pakistan, as a whole are more capital efficient as compared to the local controlled commercial banks subject to few exceptions.

Ongore and Gemechu (2013), used linear multiple regression model and Generalized Least Square on panel data to estimate the determinants of financial performance of commercial banks in Kenya. Their finding reveals that specific factors such as capital adequacy, asset quality and management efficiency significantly affect the performance of Kenyan commercial banks, except for liquidity variable. The relationship between bank performance and capital adequacy and management efficiency was found to be positive and for asset quality the relationship was negative. But the overall effect of macroeconomic variables was inconclusive and the role of ownership identity on the financial performance of commercial banks was insignificant. Even if it is found that GDP has negative correlation with performance indicators, the relationship is insignificant.

Tesfaye (2013) carried out to empirically explore the bank specific, industry specific and macroeconomic determinants of Ethiopian commercial banks' performance by using unbalanced 10 years (2003-2012) annual audited financial statements of 16 banks and macroeconomic data. It covers 100% of the population (commercial banks in Ethiopia) which are operating full years in the study period. The study used three indicators of profitability as dependent variables: Return on Asset (ROA), Return on Equity (ROE) and Net Interest Margin (NIM) and ten explanatory variables: Bank Size, Capital adequacy, Operational efficiency, Liquidity risk, Income Diversification, and Loan to Deposit Ratio from bank specific factors, Bank Concentration and Size Bank System from industry specific factors and Real GDP Growth rate and Annual Inflation Rate from macroeconomic factors. Fixed effect was used for the ROA model, and Random effect for ROE and NIM models based on Hausman test. The empirical result revealed that all bank specific factors except Loan to Deposit Ratio are statistically significant in determining profitability of Ethiopian commercial banks. Among them Cost

Income Ratio and Liquidity negatively affect bank performance. There are also significant associations between Concentration and Size Bank System with profitability. However, no evidence is found about the relation between macroeconomic factors and performance of banks. In general, the overall empirical findings provide evidence that the profitability of Ethiopian commercial banks are mainly dominated by bank-specific factors which are on the hands of the management of the banks. So, the study suggests to the banks' managers and policy makers to give high concern on the internal factors of profitability and set direction to manage the most dominant factors of performance.

Samuel (2015) conducted a study on determinants of Ethiopian Commercial Banks profitability from year 2002 to 2013. Banks are the most crucial financial intermediaries in the economy and economy that have profitable banking industry are better able to withstand negative shock and contribute to the stability of the whole economy. The study used mixed research approach and secondary financial data are analyzed by using multiple linear regressions models for the bank profitability measure, Return on Asset (ROA). Fixed effect regression model was applied to investigate the impact of bank size, capital adequacy, liquidity risk, operating efficiency, management efficiency, employee efficiency, funding cost, banking sector development, real GDP, inflation rate and foreign exchange rate on Return on Asset (ROA) and also primary data was used to support the result of the documentary analyses. The findings of the study show that bank size, capital adequacy and

gross domestic product have statistically significant and positive relationship with bank's profitability. On the other hand, variables like liquidity risk, operational efficiency, funding cost and banking sector development have a negative and statistically significant relationship with banks' profitability. However, the relationship for Management efficiency, employee efficiency, Inflation and foreign exchange rate is found to be statistically insignificant. The study suggests that focusing and reengineering the banks alongside the key internal drivers could enhance the profitability as well as the performance of the commercial banks in Ethiopia.

Dawit (2016) conducted a study on the determinants of financial performance of commercial banks in Ethiopia by using panel data of seven sample commercial banks out of eighteen commercial banks operated in Ethiopia over the period 2000-2014. Since the data is secondary in nature, the quantitative approach to research was used. Besides, the random effect model was used. Under this study, both internal and external factors were included. The internal factors used in this study include capital adequacy, Asset quality, earning ability, liquidity management and Bank size whereas, the external factor is foreign exchange rate. Moreover, ROA, ROE and NIM were used to measure the financial performance. This study runs a redundant fixed effects test using Hausman specification test. Hence based on the result random effect model was adopted. Based on the regression result; asset quality, earning ability and bank size have a significant influence on the financial performance of Ethiopian commercial banks measured by return on asset, return on equity and net interest margin. Thus, management bodies of commercial bank should strive to strengthen the identified significant factors.

2.6. Conclusion and knowledge gap

Nowadays, examining the performance of commercial banks become very crucial for their profitable survival. The survival of commercial Banks in this dynamic economic environment is very dependent upon their good performance that based on scientific investigation. So, its wellbeing and successful operation captures the interest of different researchers and other professionals.

Thus, a number of studies have examined the determinants of banks' performance in many countries around the world. For instance Nassreddine et al. , (2013) for Tunisian banks, Okoth,V&Gemechu,B, (2013) for Kenyan banks, Ezra, (2013) for SSA banks, Tan & Floros, (2012) for China banks, Sarita, et al. (2012) for Indonesian banks, Dietrich & Wanzenried, (2009) for Switzerland banks, Sufian F., (2011) for Korean banks, Sufian & Shah, (2009) for

Bangladesh banks and others undertook studies on financial performance of bank. Even though, all these and other researchers conducted study on this area, the determinants of financial performance have been debated for many years and still unsolved issues in the corporate finance literature. Studies show, there are no universally accepted findings on what determines financial performance of the banking sector, because countries vary each other in their economic systems, financial systems, political systems and operating environments. When come to our country, various studies have been done in Ethiopia concerning the determinants commercial banks performance such as Habtamu N., (2012); Tigist A.,(2014); Amdemikael, (2012); Belayneh, (2011); Rao & Tekeste, (2012); Tesfaye, (2013); Enyew, (2013); Damena,(2011); Birhanu, (2012); Samuel, (2015) and Dawit, (2016) conducted on determinant of profitability in Ethiopian commercial banks. However, Damena (2011), Rao & Tekeste (2012), Birhanu (2012) and Amdemikael (2012) didn't include credit risk, solvency risk, interest rate risk and foreign exchange rate risk. Also, Belayneh (2011) didn't include solvency risk, liquidity risk and foreign exchange rate risk. In addition, Tesfaye (2013) and Dawit (2016) didn't include interest rate risk, credit risk and foreign exchange rate risk. Furthermore, Samuel (2015) didn't include interest rate and credit risks. Finally, Enyew (2013) didn't include solvency risk. Besides to this, Rao & Tekeste (2012); Tesfaye (2013), Enyew (2013) and Samuel (2015) imply that liquidity had a significant negative impact whereas Dawit (2016) and Amdemikael (2012) imply that liquidity had insignificant impact on performance of the Ethiopian commercial banks. In contrary, the finding of Sanl and Heng (2013) imply that liquidity had a positive significant impact on the performance of commercial banks. The findings of Habtamu (2012), Tigist (2014), Amdemikael (2012), Belayneh (2011), Rao & Tekeste (2012) Tesfaye (2013), Enyew (2013), Damena (2011), Birhanu (2012), Samuel (2015) and Dawit (2016) imply that inflation didn't have significant effect on performance commercial banks. Nevertheless, Sufian (2008) confirms that inflation had a significant and negative impact on performance commercial banks. In the contrary, there are studies that found a positive and significant effect of inflation on commercial banks performance, such as the finding by Lelissa, (2014); Athanasoglou et al., (2005, 2008); Guru et al., (2002); Demirguc-Kunt& Huizinga, (2001); Flamini et al., (2009); Garcia-Herrero et al., (2009); Gul et al., (2011); Sufian, (2011); Trujillo Ponce, (2013); Vong& Chan, (2006) and Frederick, (2015).

As described in the above, not only the previous empirical results in different hemisphere of the world but also the previous Ethiopia studies indicate various out comes while using the

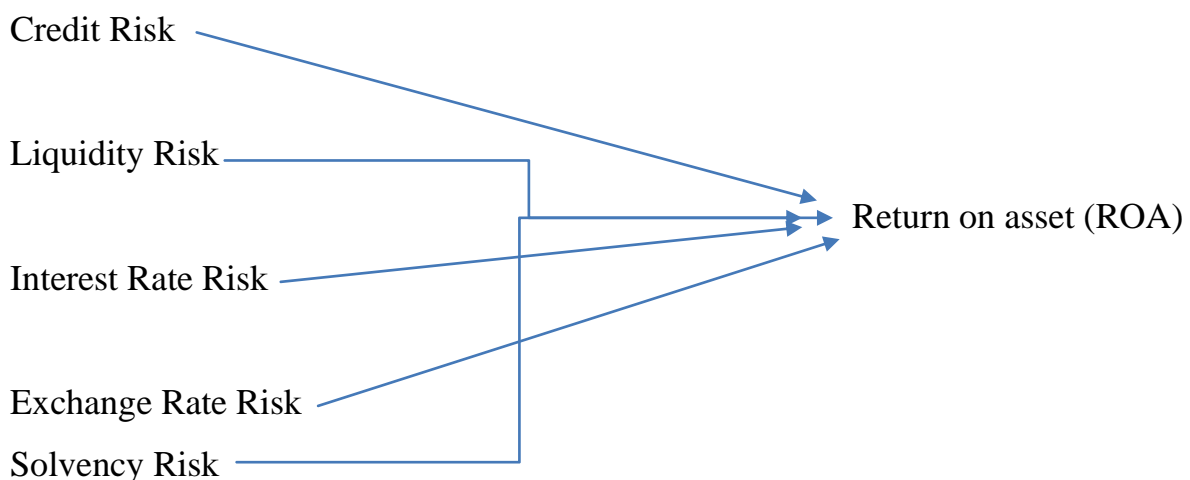
same variables to examine the determinants of performance of commercial banks. In addition, the above listed previous Ethiopia studies conducted on determinant of profitability in Ethiopian commercial banks. However, these all researches didn't mainly concentrate on the effect of financial risk on the performance of commercial banks of Ethiopia. Therefore, this study tries to fill the above literature gap with the basic intention to identify the effect of financial risk on the performance of Ethiopian commercial banks from 2005 to 2018. In addition, a lot of literatures are developed to examine the determinants of banks performance but those studies show different and even contradictory results. This reveals that there is no consistency in the banking literature on the determinants of bank performance.

Generally, the present study differs from the earlier studies in many ways and enriches the existing literature in the following ways: Firstly, it has included variables other than the variables included by other scholars in Ethiopia context for measuring bank performance. Secondly, the study presents the performance of banks from 2005 to 2018.

2.7. Conceptual Framework

Conceptual framework is a scheme of concept (variables) which a researcher operationalizes in order to achieve the predefined objectives of the study. Meaning conceptual frame work shows the linkage between independent variables to the dependent variable. From the theoretical and empirical literature reviews, the following conceptual framework of the study is developed by the researcher.

Figure2.1 The conceptual framework or model of the study



CHAPTER THREE

3. RESEARCH DESIGN AND METHODOLOGY

This chapter deals with the research methodology used to carry out this study. In its first part there is a design of the research, then it later presents on the approach of research, population, sample and sampling method, data form, sources and instruments, data analysis and model specification. Final part presents on the Description and the operationalization of variables.

3.1. Research Design

Cooper et al. (2003) explained that explanatory studies, unlike descriptive studies, drive away from state observation and description and try to elucidate the reasons for the phenomenon. The design of explanatory research was used in this research for the reason that the research classifies the cause and effect of financial risk and the performance of commercial banks, which is proper to attain the objective of the study.

3.2. Research approach

A research by directing an investigation, here are diverse ways to address the problem. According to Creswell (2009), there are three research methods: quantitative, qualitative and mixed. The subsequent discussions concisely describe the basic characteristics of these research practices. Quantitative research is a method to test objective theories by investigating the association between variables Creswell (2009). In contrast, the qualitative research methodology is a means to investigate and understand the meaning that individuals or groups attribute to a social or human problem by way of the intention of developing a theory or pattern inductively Creswell (2009). Finally, the mixed method is a method in which researchers underline the problem of research and practise all available methods to realise the problem Creswell (2003). Thus, depending on the previous deliberations of the three research methods and considering the problem of research and the objective, the quantitative research method was used. Therefore, to gain a well understanding and a richer understanding of the impact of financial risk on the performance of commercial banks, the quantitative research method was used.

3.4. Population of the Study

According to Kothari (2006), the population of a study is simply the whole set of individuals or articles that are described in the study as the study area and that the researcher is trying to observe their characteristics or behaviours. The population is of all articles that fit the study

area and it should be noted that this is the area that the researcher selects a suitable sample for subject to the study? The target population of the research will be all commercial banks registered under national bank of Ethiopia. At present, there are seventeen commercial banks in Ethiopia that are one of the governments and 16 privately owned commercial banks.

Table 3.1 Banks Lists in Ethiopia

S.N	Name of bank	Year of establishment	Ownership
1	Commercial Bank of Ethiopia (CBE)	1963	public
2	Awash International Bank S.C (AIB)	1994	private
3	Dashen Bank S.C (DB)	1995	private
4	Bank of Abyssinia S.C (BoA)	1996	private
5	Wegagen Bank S.C (WB)	1997	private
6	United Bank S.C (UB)	1998	private
7	Nib International Bank S.C (NIB)	1999	private
8	Cooperative Bank of Oromia S.C (CBO)	2005	private
9	Lion International Bank S.C (LIB)	2006	private
10	Oromia International Bank S.C (OIB)	2008	private
11	Zemen Bank S.C (ZB)	2009	private
12	Bunna International Bank S.C (BIB)	2009	private
13	Berhan International Bank S.C (BBI)	2010	private
14	Abay Bank S.C. (AB)	2010	private
15	Addis international Bank SC. (AdIB)	2011	private
16	Debub Global Bank S.C. (DGB)	2012	private
17	Enat Bank S.C. (EB)	2013	private

Source: NBE annual report, 2018

3.5. Sample and Sampling Techniques

The entire population of commercial banks is seventeen, but in order to study the researcher used sample of seven commercial sample banks out of 17 commercial banks that operated in Ethiopia. As a result, the research covered a period of fourteen years (14 years since 2005-2018) where recent data will be obtained and the researcher used a sampling method of purposive to take out the sample from the population and meet the predefined objective of the study. The matrix of the framework is 7by14 which includes 98 observations.

3.6. Data sources and instruments

To accomplish any research doings; Information need be collected from sources. As stated by Yuqi (2006), secondary data take its own benefits. Equated with primary data, secondary data deliver greater quality data, viability of longitudinal studies and data retention, which means that secondary data commonly provide a data source that is permanent and available in a form that can be checked relatively easily by others. As a result, to increase data reliability, the study used secondary data based on the audited financial statement of banks that are readily accessible on its website and archives, as well as macroeconomic data were collected from MoF, and other documents published and unpublished.

3.7. Data analysis technique

Technical data analytic to accomplish the predefined objective of the study, the study focused mainly on quantitative analyses and reinforced by qualitative analyses. Therefore, the researcher used the econometric model to identify and measure the impact of financial risk on the performance of Ethiopian commercial banks and used the linear multiple regression model. For effective data analysis, Stata14.2 Econometric software will be used in study.

According to Brooks regression (2008) refers to the description and evaluation of the association among a specified variable called the dependent variable and one or more other variables called independent variables. Therefore, to determine the relationship, the study used the return on assets (ROA) as a substitute for the bank's financial performance as a dependent variables and independent variable including liquidity risk, solvency risk, credit risk, interest rate risk and foreign exchange risk while using GDP and bank size as control variables. In addition to that, the researcher uses the panel regression model in particular, the random effect panel data regression model to examine the effect of financial risk on the performance of commercial banks.

As stated by Brooks (2008) panel data is favoured for situation often arises in financial modelling where we have data comprising both time series and cross-sectional elements. In addition, the researcher can address a broader range of issues and tackle more complex problems with panel data than would be possible with pure time-series or pure cross-sectional data alone. Accordingly, the study model focuses on panel data technique that comprises both cross sectional elements and time-series elements; the cross-sectional element is reflected by the different Ethiopian commercial banks and the time-series element is revealed by the period of study

(2005-2018). Therefore, the collected panel data is analyzed by using descriptive statistics, correlations and multiple linear regression analysis.

3.8. Specification of the model

Given that to Brooks (2008), it is relaxed condition to generalize the simple model to one with k regressors (independent variables). $Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \dots + \beta_k X_{ki} + \epsilon_i$, $i = (1, 2 \dots i)$.

So, where Y_i is the i^{th} observation of the dependent variable, X_{1i}, \dots, X_{ki} are the i^{th} observation of the independent variables, β_1, \dots, β_k are the regression coefficients, ϵ_i is the i^{th} observation of the stochastic error term.

Thus, to examine the impact of financial risk on Commercial banks' performance, the researchers as estimated a linear regression model in the subsequent formula.

$$ROA_{bt} = \beta_0 + \beta_1 LR_{bt} + \beta_2 CR_{bt} + \beta_3 SR_{bt} + \beta_4 IRR_{bt} + \beta_5 BS_{bt} + \beta_6 ERR_{bt} + \beta_7 GDP_{bt} + \epsilon_i$$

Where:

ROA= Return on asset;

CR= Credit risk

LR= Liquidity risk

SR= Solvency risk

IRR= Interest Rate Risk

ERR = Foreign Exchange Rate Risk

BS=Bank size (control variables)

GDP=Real gross domestic product (control variables)

ϵ =is the error part for bank b at time t supposed to take mean zero $E[\epsilon] = 0$ $\beta_0 =$

Constant $\beta = 1, 2, 3 \dots 7$ are parameters to be estimate; $b =$ commercial bank $b = 1 \dots 7$; and $t =$ the index of time periods and $t = 1 \dots 14$.

3.9. Variables description

As said by Creswell (2009), to clearly show readers which groups receive experimental treatment and what the measured results are, the variables must be stated in quantitative research. Accordingly, this section described the variables that will use as dependent and independent Variables in the study. Meanings and measurements of variables are termed as follows. Furthermore, the hypothesis is as well developed from earlier empirical evidence.

3.10 Dependent variable

3.10.1 Return on asset (ROA)

The study uses Asset Return to measure the financial performance of Ethiopian commercial banks. According to Daniel et al. (2013) it is noted that the return on the total assets (ROA) is calculated as net profit after tax by the total assets. This is probably the single most important ratio to compare the effectiveness and financial performance of commercial banks, as it indicates returns generated by the assets that banks have. Moreover, as showed by Ana-Maria et al. (2014), the return to total asset ratio is one of the best broadly used methods for quantifying financial performance. It was developed in 1919 by DuPont and stresses the business's capability to use its assets efficiently. As Mirie (2015) pointed out, financial performance is a measure of an organization's earnings, profits, and valuations as shown by the entity's increased share price. As Amal explained (2012) the return of assets determines a company's ability to use its assets and the return of own funds displays what return investors take for their investments. The benefits of financial measures are the ease of calculation and that meanings are agreed around the world. Accordingly, most of the preceding researches on insurance, asset return (ROA) are being used as a performance representative (Arif et al., (2015); Adrian, (2014); Yuvaraj et al., (2013) and Mirie, (2015). It therefore takes Asset Return (ROA) as a dependent variable to measure the performance of Ethiopian commercial banks.

3.11. Independent Variables

This subdivision refers to the independent variables that will use the econometric model to predict the dependent variable. To measure the impact of financial risk variables on the performance of commercial banks in Ethiopia, seven measures are used as independent variables derived from various studies. Variables for instance credit risk, liquidity risk, interest rate risk, solvency risk, GDP (control variable), bank size (control variable) and risk of exchange rate.

3.11. 1. Liquidity Risk

Liquidity risk is the likelihood that a bank does not have adequate cash and borrowing capacity to meet deposit withdrawals, loan demand and other cash requirements. This is also the inability to manage changes in funding. Basically, the liquidity risk also comes from the lack of recognition of changes in market conditions that affect the ability to quickly liquidate assets with minimal losses. Thus, liquidity risk can be a crucial measure for the bank's profitability. The current ratio is chosen to represent the liquidity risk of banks in this article.

The current ratio is the most popular measure of liquidity risk. It is the ratio that indicates the efficiency of a banking operating cycle to convert your assets into cash. The abler the bank is to pay its obligation.

Liquidity risk = current assets ÷ current liabilities

3.11. 2. Credit risk

Credit risk is the risk that the borrower will not be able to make the payment on the credit. The credit risk is calculated on the basis of the borrower's overall repayment capacity. There are many ways to calculate credit risk, such as unrealized credit and risk-weighted assets. However, the loan loss offer for total credits is used to assess credit risk in this investigation. It is compensation that is reserved for bad claims. The bank needs to increase the amount of credit for loss of credit when exposed to high-risk credit. This is because there is a high growth in unpaid appropriations. A higher credit loss ratio will reduce net income and earnings per share. The lower the ratio, the better it is for the banks.

Credit risk = Loss loan provision ÷ Total loans

3.11. 3. Solvency Risk

A general definition of bank solvency is the ability of the bank to pay its obligations when they come due without interrupting banks' activities. Thus, Solvency risk may be defined as the variations in the equity to absorb losses or the potential inability to meet the maturing obligations. Capital to assets ratio represents the bank's cushion against unanticipated losses and thus protects the interests of uninsured depositors.

3.11. 4. Interest Rate Risk

Interest rate risk is changes in asset value due to unexpected changes in the interest rate. The actual interest rate risk is used to assess the interest rate risk for this investigation. The reason is because real interest is a more accurate indicator than nominal interest rate and does not consider rate inflation. It reflects the actual cost of credit to the borrower and the actual return to the lender.

Real interest rate = average annual nominal interest Rate – Annual inflation

3.11. 5. Foreign Exchange Rate Risk

The exchange risk occurs when a bank has foreign currency assets or liabilities and imposes the bank's profits and capital due to exchange rate variations. No one can forecast what the exchange rate will be in the subsequent period, it can change upwards or downwards

irrespective of what the estimates and predictions be situated. This indeterminate movement poses a risk to the bank's profits and capital, if such a move is in the undesired and unanticipated way Evans.O (2014) songulKakilli (2013) Turkish banks the sector's profitability factors found a positive relationship between the exchange rate and profitability. This variable therefore has a significant and positive impact on profitability. The authorised exchange rate brings up to the exchange rate decided by the national authorities or the rate recognised on the exchange market authorised by law. It is calculated as a yearly average based on monthly averages of the local money units in relation to the united states dollar.

3.11. 6. Real GDP growth

This variable is one of the greatest measures to determine the total economic activity of a country. Fluctuations in GDP reveal variations in consumption, investment, public spending and net export; and so, variations in the GDP are expected to affect the supply and demand of credits and deposits. Gross domestic product growth is the yearly variation in the GDP.

3.11. 7. Bank Size (BS)

Total bank assets measure the bank size. In most literature, the total assets of banks are as a representative for the size of the bank. However, since the total assets collapsed the model dependent variable (ROA) it would be appropriate to take natural logarithm before including in the model to be compatible with other proportions. Among the factors identified, the size of the bank identified as significantly affecting banks' performance. The effect of bank size on unregulated performance in documentation because of this, the expected sign is ambiguous. An increase in size may result in a reduction or an increase in banks' financial performance due to the situation (Ani et. Al. 2012). As indicated by Kaaya & Pastory (2013), small banks generate less profit than large banks. However, a larger bank with economies of scale as well as the number of branches could be able to attract better depositors as previous studies; this research also uses the total asset log to measure the size of private commercial banks. The expected sign was positive and calculated as follows:

Bank size = natural logarithm of total asset

Bank size = LN (TA)

3.12. Operation of study variables

The next table shows independent variables, proxies and the predictable sign of the effect of independent variables on the performance of banks.

Table 3.2 Description of the variables and their expected relationship

Independent Variables	Proxies	Predicted Associations with ROA
Liquidity Risk	Current asset \div current liability	+
Credit Risk	LLP \div Total Loans	-
Interest rate risk	Nominal interest - inflation	+
Solvency Risk	capital \div <i>total asset</i>	+
Foreign exchange rate risk	ETB to US dollar	+

Chapter Four

4. Data Presentation, Analysis and Discussions of Results

This chapter deals with the analysis and presentation of the results of the study. The data were analyzed by using Stata version 14.2 software. The descriptive statistics and the correlation analysis were used. Followed by the diagnostic test, which is necessary to fulfil the assumption of the classical linear regression model. Then, econometric analysis and discussion of the main finding of the study were presented. Finally, the results of the regression analysis were discussed by supporting empirical evidence.

4.1. Descriptive statistics

This part discusses Descriptive statistics of dependent and independent variables used in the study for sample banks. The dependent variables used in the study were ROA despite the fact that the independent variables were credit risk, liquidity risk, interest rate risk, solvency risk, exchange rate risk, GDP(control variable) and bank size(control variable). Thus, the overall observation for each dependent and independent variable remained ninety-eight which is a data from the Group of seven commercial banks for fourteen years. The Table below shows the average, standard deviation, smallest and higher values for dependent and independent variables for sample banks during the year 2005 to 2018.

The ROA calculated as NIAT over TA takes an average rate of 298.32 percent. This indicates that the selected banks on average obtained a NIAT of 298.32 percent of total assets. Since ROA indicates the effectiveness of managing a company in the generation of NIAT from entire wealth of the organisations, the more ROA indicate that the business is more effective in consuming its resources. The supreme value of ROA existed 468.42 percent but the least value of ROA existed 38.02 percent. This means that the most profitable and less profitable banks among the Ethiopian commercial banks included in the sample were earned 4.68 birr and 38.02 cents of net income for a single birr invested in the company's assets, respectively.

For independent variables, the liquidity risk measured by current assets divided by current liabilities has an average value of 39.68 percent. The average value indicates that for each liability of a single birr, there were 39.68 cents current assets to meet the obligations. A minimum and maximum value of 5.91 and 80.18 percent, correspondingly. Moreover, to this, the standard liquidity risk deviation was 18.42 percent. The second independent variable used in the study was the credit risk measured by loan provisions divided by the total loans has an

average value of 3.16 percent with a highest and least value of 0 and 21.16 percent, correspondingly. This means there is a small amount of uncollectible balance. The third independent variable used in the study was the interest rate risk reflecting the actual cost of credits to the borrower and the actual return to the lender has an average value of 11.512 percent with a highest and lowest value of 14.25 and 9.75 percent, correspondingly. The 4th Independent variable used in the study was the solvency risk measured by the total equity divided by the total assets has an average value of 11.97 percent with a highest and lowest value of 19.21 and 2.06 percent, respectively. In addition, the standard solvency risk deviation was 3.65 percent. The 5th independent variable used in the study was the exchange rate risk calculated on an annual average based on the monthly averages more specifically of local currency units (Ethiopian Birr) to US dollar has an average value of 17.03 percent with the highest and lowest value of 28.05 and 8.68 percent, correspondingly. In addition, the standard deviation was 6.15 percent. This means that the exchange rate of Ethiopian birr to US dollar in Ethiopia during the study period, from 2005 to 2018 remains very unstable. The sixth independent variable used in the study was the GDP the average value of the GDP real growth rate was 10.04%, demonstrating the average real growth rate of the nation's economy in the earlier fourteen years. The highest growth in the economy was 11.8% and the lowest was 7%. Since the average of 2005 On, the country has recorded a two-digit growth rate with a low dispersion to the average during the period studied, with a standard deviation of 1.24%. The last but not the least independent variable used in the study is the size of the bank which has an average value of 9.45 with the standard deviation of 1.32. The highest and lowest values were 13.34 and 6.97, correspondingly. Gibson (2001) suggests that the influence of the size of a growing bank on profitability can be positive up to a certain boundary. Therefore, banks with large size have an advantage of absorbing some risks.

Table 4.1: Summary of variables descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	98	2.983282	.7397001	.3802533	4.684208
LIQUIDITYRISK	98	.396874	.1842885	.0591852	.8018894
CREDITRISK	98	.031638	.0328442	0	.2116995
INTERESTRISK	98	-3.257143	9.867683	-24.15	9.45
SOLVENCYRISK	98	.1197292	.0365335	.0206568	.1921772
FOREIGNEXCHANGE	98	17.03207	6.151343	8.681	28.0543
GDP	98	10.04071	1.243921	7.7	11.8
banksizelog	98	9.456968	1.329504	6.978214	13.34561

Source: Calculation of the researcher through stata14.2

Note: Liquidity Risk (LR), Credit Risk (CR) Interest Rate Risk (IRR), Solvency Risk (SR), Foreign Exchange Rate Risk (ERR), GDP and Bank size(BS)

4.2. Correlation analysis of the variables

Correlation coefficient values always range from +1 to -1. A correlation coefficient of +1 indicates that the existence of a perfect positive relationship among the two variables, whereas a correlation coefficient of -1 point toward a perfect negative relationship. A correlation coefficient of zero, contrariwise, shows the absence of a connection among two variables (Brooks, 2008). The next table displays the correlation matrix between dependent and independent variables.

Table 4.2: Variable correlation analysis

	ROA	LIQUIDITYRISK	CREDITRISK	INTERESTRATE	SOLVENCYRISK	FOREIGNEXCHANGE	GDP	banksizeLog
ROA	1.0000							
LIQUIDITYRISK	0.3372	1.0000						
CREDITRISK	-0.1174	0.6060	1.0000					
INTERESTRATE	-0.2287	-0.3760	-0.2461	1.0000				
SOLVENCYRISK	0.3593	0.1456	-0.2932	0.0196	1.0000			
FOREIGNEXCHANGE	-0.2680	-0.6207	-0.5803	0.4197	0.1010	1.0000		
GDP	0.2046	0.4565	0.4537	-0.0285	-0.0934	-0.7395	1.0000	
banksizeLog	-0.3401	-0.5225	-0.1716	0.2578	-0.4881	0.6417	-0.4969	1.0000

Source: Researcher’s computation through Stata 14.2

The correlation end result in table 4.2 displayed liquidity risk, solvency risk and GDP have a positive association in the ROA to measure the performance of Ethiopian commercial banks. This means that any decrease/increase in liquidity risk, solvency risk and GDP leads to a decrease/increase in the financial performance of commercial banks (ROA). However; Credit risk, interest rate risk, the exchange rate risk and the size of the bank have a negative correlation over the ROA to measure the performance of Ethiopian commercial banks. This indicates that any increase/decrease in solvency risk, interest rate risk and foreign exchange rate risk leads to a decrease/increase in the financial performance of commercial banks (ROA). The correlation coefficient estimates in the table above show 0.3372, 0.3593, and 0.2046 for liquidity risk, solvency risk and GDP, respectively. this means that liquidity risk, solvency risk and GDP are lower in positive correlation with ROA and credit risk, interest rate risk, the foreign exchange rate risk and the bank's size coefficient estimates are -0.1174, -0.2287, -0.2680 and 0.3401, respectively, which is less in negative correlation with the ROA of Ethiopian commercial banks. In addition, table 4.2 above provided a summary of the degree of correlation between the explanatory variables included in this study. According to Malhotra (2007), multicollinearity complications exist while the correlation coefficient among the explanatory variables must be larger than 0.75. However, Brooks (2008) stated that if the correlation coefficient together with the independent variables is 0.8 and more,

multicollinearity complications will exist. However, the correlation matrix in Table 4.2 above displayed the absence of a strong association among variables.

4.3. Tests of the regression model

Effective proposition testing and to create data accessible for reliable outcomes, it is essential to test the regression model hypothesis. So, the research underwent the best important regression diagnostic tests, which consist of normality, multicollinearity, heteroscedasticity and model specification tests consequently.

4.3.1. Selection of the model whether random or fixed effect models

Use fixed effects (FE) when you are only interested in analysing the effects of variables that vary over time. FE explores the relationship between forecasting and outcome variables within an entity (country, person, company, Etc. Each entity has its own individual characteristics that may or may not affect forecasting variables (for example, being a man or a woman could affect the opinion about certain issues; or the political system of a given country could have an effect on trade or GDP; or business practices of a company may affect its stock price). When we use FE, we assume that something within the person can have an impact or bias on the prediction or outcome variables and we need to control it. This is the reason for the correlation hypothesis between the entity's error term and predictor variables. FE removes the effect of these invariant time characteristics so that we can evaluate the net effect of predictors on the result variable. Another important assumption of the FE model is that these invariant characteristics of the s time are unique to the person and should not be correlated with other individual characteristics. Each entity is therefore different from the error term of the entity and the constant (which captures the individual characteristics) should not be correlated with the others. If the error terms are correlated, then FE is not suitable since inferences may not be correct and you must model this relationship (probably using random effects), this is the main reason for the Hausman test (presented later). The reason for the random effects model is that, dissimilar to the fixed effects model, disparity between entities is presumed to be random and unrelated to the predictor or independent variables included in the model: "... The crucial difference between fixed and random effects is whether the unobserved individual effect embodies elements that are correlated with regressors in the model, not if these effects are stochastic or not» [Green, 2008, p.183]

If you have reason to believe that differences between different entities have some influence on your dependent variable, you should use random effects. One advantage of the random effects is that you can include time invariant variables (i.e. Gender). In the fixed effects model, these variables are absorbed by the Intercept. the random effects model is: $Y_{it} = X_{it} + \alpha + ITU$ (error between entities) random effects support that the entity's error term is not interrelated with predictors that allow temporal invariant variables to play a role as explanatory variables. In random effects, you must specify the individual characteristics that may or may not affect the predictor variables. The problem with that is that some variables may not be available, resulting in a variable bias omitted in the model. RE makes it possible to generalize inferences beyond the sample used in the model.

According to Brooks (2008) commonly two types of panel estimators that can be used in financial Research: fixed effect models and random effect models. The select among the two methods is made by doing a Hausman test. To perform a Hausman test, the number of cross-sections should be more than the number of coefficients to be estimated. In this study, the number of cross-sections is greater than the number of coefficients to be estimated, so a Hausman test is possible. For example, to determine whether random or fixed effects are required, this study tests Hausman specifications as recommended by Brooks (2008) and others. The hypothesis aimed at the model choice test was expressed in this manner;

H₀: The random effects model is appropriate.

H₁: Fixed effects model is appropriate.

$\alpha = 0.05$ decision rule: discard **H₀** if the P value is less than the 0.05 significant levels. If not, do not discard H₀. As can be seen in table 4.3, the p value was 0.996. Therefore, the random effects model is appropriate since the p value is higher than the significant level 0.05.

Table 4.3 Hausman fixed random test

	— Coefficients —		(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
	(b) fixed	(B) random		
LIQUIDITYR~K	1.856948	1.775587	.0813613	.0610046
CREDITRISK	-13.72503	-12.78554	-.9394892	.7339456
INTERESTRA~K	-.0086779	-.0089667	.0002888	.
SOLVENCYRISK	4.288812	5.071952	-.7831402	1.220155
FOREGINEXC~K	.0055209	-.0365526	.0420735	.0315994
GDP	.0652339	.0836301	-.0183962	.0123714
banksizeLog	-.2359051	.095358	-.3312631	.2520567

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

$$\text{chi2}(7) = (b-B)'[(V_b-V_B)^{-1}](b-B)$$

$$= 0.46$$
 Prob>chi2 = 0.9996
 (V_b-V_B is not positive definite)

4.4. Tests for the Classical Linear Regression Model Assumptions

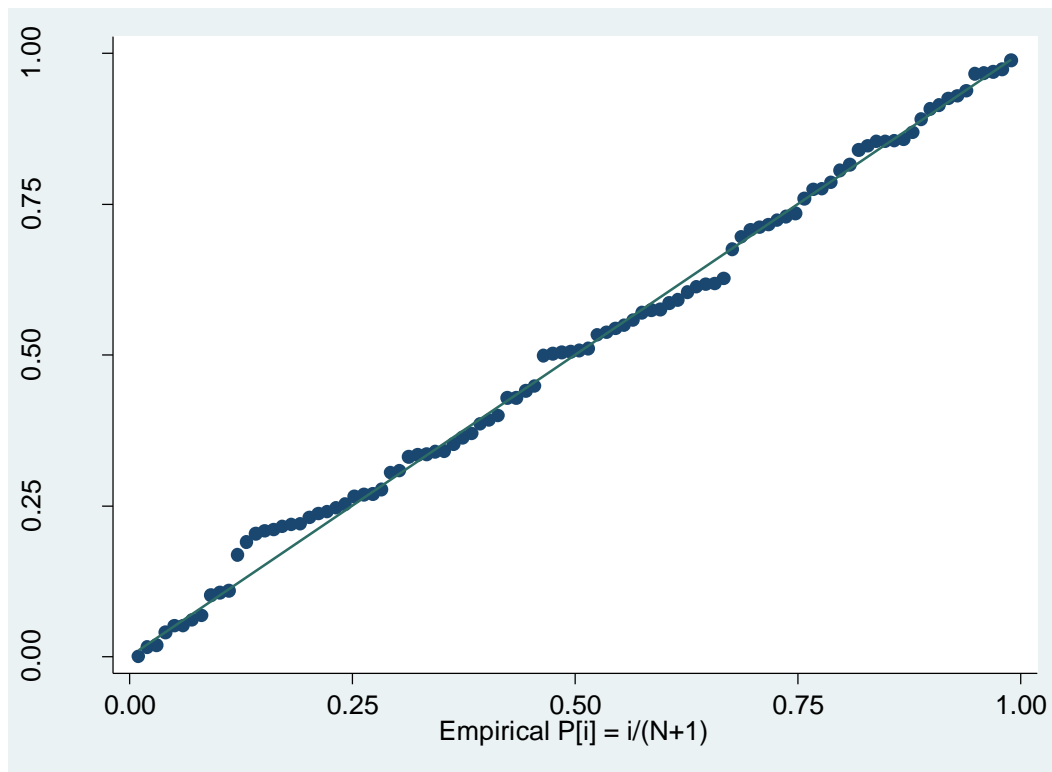
The regression outputs to be reliable and acceptable by users, the regression outputs shall pass the diagnostic tests of Classical Linear Regression Model (CLRM) assumptions. The assumptions of CLRM holds true, the OLS creates the best possible estimates and the model becomes BLUE otherwise the credibility of the model is in question.

Tests for the classical linear regression model (CLRM) assumptions to keep the validity and robustness of the data of the regressed outcome of the research, the basic linear regression model (CLRM) assumptions need be tested to detect any misspecification and correct them to enhance research quality (Brooks, 2008). Here are diverse CLRM assumptions which are essentially to be fulfilled and that are tested in this research, which are: linearity, autocorrelation, and error equal to zero mean test, multicollinearity, hetroscedacticity, model specification test and normality test.

4.4.1. Linearity

In this assumption, all terms in the model are either a constant or a parameter multiplied by an independent variable. In the diagram hereunder shows that the residuals are linearly distributed across the observations and linearity assumption has been fulfilled.

Figure 4.1 linearity graph



4.4.2. Autocorrelation

The autocorrelation assumption the classical model assumes that the disturbance term relating to any observation is not influenced by the disturbance term relating to any other observation. As stated by Brooks (2008), while the error term for any observation is related to the error term of other observation, it indicates that autocorrelation problem exists in the model however the estimated parameters can still remain unbiased and consistent but it is inefficient. The existence or nonexistence of autocorrelation problem was tested by using Breusch-Pagan LM test of independence. The null hypothesis states that there is no serial correlation.

H0: there is no serial correlation.

H1: there is serial correlation.

As shown in table 4.4 below, $\text{Prob} > \chi^2 = 0.3349$ is greater than 0.05. This shows that the null Hypothesis of the model, which says no serial correlation, cannot be rejected at 5% level of significance. The result shows us there is no Autocorrelation problem.

Table 4.4 Breusch-Pagan LM test of independence.

Correlation matrix of residuals:							
	__e1	__e2	__e3	__e4	__e5	__e6	__e7
__e1	1.0000						
__e2	-0.1874	1.0000					
__e3	0.6691	0.2221	1.0000				
__e4	-0.1054	0.3580	-0.1673	1.0000			
__e5	0.0423	-0.1114	0.2235	-0.2911	1.0000		
__e6	0.1463	0.0968	-0.0854	-0.1366	0.3846	1.0000	
__e7	0.0543	0.6336	0.3141	-0.0843	0.0765	0.2937	1.0000

Breusch-Pagan LM test of independence: $\chi^2(21) = 23.172$, Pr = 0.3349
Based on 14 complete observations over panel units

4.4.3. The errors have zero mean value

This section displays the test for the assumptions of the classic linear regression model (CLRM), namely, the error has a mean zero. Convey on Brooks (2008), the primary assumption required is that the mean value of errors is zero. Actually, if a constant term is included in the regression equation, this assumption will never be violated. Therefore, the regression model of this study has included a constant term, so that this assumption was not violated.

4.4.4. Test for heteroscedasticity assumption

As Brooks (2008) shows, this assumption have need of the variation of errors designate constant. If errors do not take a constant variation, it is supposed that the assumption of homoscedasticity has been violated. This violation is named as heteroscedasticity. If heteroscedasticity occurs, Estimators of the less ordinary square method are ineffective and hypothesis tests are no longer reliable or valid as they will underestimate variations and standard errors. There are numerous tests to distinguish the problem of heteroscedasticity, which are Park test, Glesjer test, Breusch-pagan-goldfrey test, White test and autoregressive conditional heteroscedasticity (ARC) try it. This trial was used to test the presence of heteroscedasticity throughout the range of explanatory variables.

H₀: the error variance is the homoscedasticity

H₁: the error variance is heteroscedasticity

In this study the heteroscedasticity test was performed using the Breusch Pagan/Cook Weisberg test through the post hettest estimation command. As can be seen in table 4.5 below, the p value was 0.0568. Therefore, the p value was not significant in rejecting the null hypothesis of constant variance. Therefore, the decision of the test displayed that no indication of heteroscedasticity and the null hypothesis is accepted. In other words, the study responds to the assumption.

Table 4.5 Breusch Pagan/Cook Weisberg test

```
. hettest

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

    chi2(1)    =    3.63
    Prob > chi2 = 0.0568
```

4.4.5. Test of multicollinearity

As indicated by Brooks (2008), an implicit assumption made when using the OLS estimation method is that the explanatory variables are not associated with each other. If there is no association among the explanatory variables, we would say orthogonal with each other. Though, a difficult happens while the explanatory variables are very associated with each other, and this problem is called multicollinearity. To test multicollinearity, variance inflation factor (VIF) has performed. VIF is done to check the multicollinearity level and leads to the multicollinearity tolerance level (Dinga et al., 2009), according to Gujarati (2004), A VIF statistic below ten implies the absence of severe multicollinearity problems. In addition, the statistic of tolerance near one means that there is little co linearity, whereas a value close to zero suggests that can be a threat. In table 4.6 below, the result shows the mean average of 3.01 which implied no need to doubt multicollinearity in the model.

Table 4.6 Test of multicollinearity

Variable	VIF	1/VIF
FOREGINEXC~K	5.73	0.174543
banksizeLog	3.79	0.264075
GDP	2.84	0.351612
LIQUIDITYR~K	2.47	0.404629
CREDITRISK	2.32	0.431375
SOLVENCYRISK	2.30	0.434951
INTERESTRA~K	1.60	0.623066
Mean VIF	3.01	

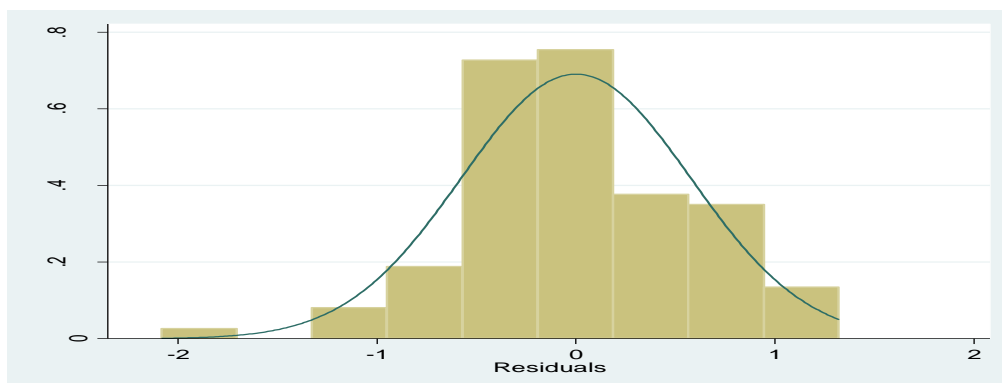
4.4.6. Test of normality (ut~N (0, σ²))

Examination of the normal distribution of study data is one of the essential requirements for linear regression analysis among study variables. Normality tests are used to decide whether a data set is fine modelled by a normal distribution or not, or to calculate the probability that an underlying random variable is normally distributed (Gujarati, 2009). This assumption requires that disturbances are normally distributed. Jarque-Bera normality Test which is the most used normality test has been performed for the model. Based on the results shown below, p values are insignificant for the model and the researcher did not reject the null hypothesis, which states that the residual value is normally distributed. Therefore, there is no problem of normality in the data used for this study. The normal test hypothesis is formulated as follows:

H₀: The Error term is normally distributed

H₁: The Error term is not normally distributed

Figure 4.1 Normality Test Result



Jarque-Bera normality test: chi2= 4.831

Prob>chi² 0.0893

Jarque-Bera test for Ho: normality:

4.4.7. Test for model specification

Final diagnostic test is model specification test said by Brooks (2008), a specification error happens while an appropriate independent variable, as well as an unnecessary variable, is omitted or the wrong function form is selected so that the regression model is wrongly predicted Which ensures that the right model is available Variables are included in the template and/or excluded to do this, the investigator used Ramsey's RESET test. The null hypothesis for this test is that the model does not contain any omitted variables and this is then accepted according to the result of statistics F as indicated below, the test showed that test F was 0.6653 Therefore, it is not important to reject the null hypothesis This indicates that the model does not contain any omitted variable.

Table 4.7 Ramsey's RESET test for Model specification

```
. ovtest

Ramsey RESET test using powers of the fitted values of ROA
Ho: model has no omitted variables
      F(3, 87) =      0.53
      Prob > F =      0.6653
```

4.5. Interpretations and Discussions of the random effects model (REM) regression results

Table 4.8: REM regression results for the impact of financial risk on the performance of ECBs (2005-2018)

Random-effects GLS regression		Number of obs	=	98		
Group variable: company		Number of groups	=	7		
R-sq:		Obs per group:				
within	= 0.3530	min	=	14		
between	= 0.4850	avg	=	14.0		
overall	= 0.3827	max	=	14		
corr(u_i, X) = 0 (assumed)		Wald chi2(7)	=	51.04		
		Prob > chi2	=	0.0000		
ROA	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
LIQUIDITYRISK	1.775587	.4926164	3.60	0.000	.8100761	2.741097
CREDITRISK	-12.78554	2.742833	-4.66	0.000	-18.1614	-7.409688
INTERESTRATERISK	-.0089667	.0072933	-1.23	0.219	-.0232612	.0053278
SOLVENCYRISK	5.071952	2.828743	1.79	0.073	-.4722829	10.61619
FOREGINEXCHANGERISK	-.0365526	.0250939	-1.46	0.145	-.0857358	.0126306
GDP	.0836301	.0771593	1.08	0.278	-.0675993	.2348594
banksizelog	.095358	.1250294	0.76	0.446	-.1496952	.3404112
_cons	.9277038	1.580934	0.59	0.557	-2.170869	4.026277
sigma_u	.25950539					
sigma_e	.55816312					
rho	.17773814	(fraction of variance due to u_i)				

4.5.1. Interpretation of results based on the random effects panel data model regression results

Probability (P> | z |) - This is the probability that the z-test statistic will be observed under the null hypothesis that the regression coefficient of a given predictor is zero, assuming the rest of the predictors are in the model in other words, the P-value indicates at what percentage or level of precession of each variable is insignificant, except for liquidity risk and credit risk. The overall R-squared value measures how well the regression model explains the actual variations in the dependent variable (Brooks, 2008) the overall R-squared statistics of the model were 38.27%. The overall R-square Worth 38.27% say the dependent variable of

Ethiopian commercial banks' return on asset is not well explained by the seven independent variables listed in the model since goodness of fit is below 50%. Therefore, these variables together are not good explanatory variables to identify the effect of financial risks on the performance of Ethiopian commercial banks.

In regression, the p-value of zero attached to the test statistic reveals that the null hypothesis that all coefficients are jointly zero must be rejected. Therefore, it indicates that the independent variables in the model could describe variations in the dependent variable. The liquidity risk ratio (LR) is 1.775587 to the ROA, which indicates that the liquidity risk of the Ethiopian commercial banks had a positive impact on the ROA, but the relationship is significant with a significant value of 5%.

In addition to this, the solvency risk (CR) is 5.071952 on ROA which refers that the solvency risk had a positive but insignificant influence on the ROA at a significant 5% level. After this, the credit risk ratio (CR) is -12.78554 on ROA, which means that credit risk had a negative and significant impact on ROA at a significant value of 5%.

The coefficient for the interest rate risk (IRR) is -0.0089667 on ROA, which refers to the fact that interest rate risk had a negative and insignificant influence on ROA at a level of 5%. The exchange rate risk coefficient is -0.0365526 showing that the currency risk has a negative and insignificant impact on the ROA of 5%. GDP is positive and has insignificant impact on ROA of 5% finally; the coefficient for the size of the bank (BS) is 0.95358 on ROA, which states that the size of the bank had a positive and insignificant influence on ROA at a level of 5%. Std. Err: -These are the standard errors of each regression coefficient they are used both in the calculation of the test statistic z_i , and in the confidence interval of the regression coefficient, superscript k . Z_i - The test statistic $z_i + s$ the ratio of the Coef. to the Std. Err. of the respective predictor. The z value is used to test against a two-sided alternative hypothesis that the Coefficients is not equal to zero

4.5.2. Discussion of the random effects panel data model regression results

This section summarizes the expected relationship and the actual relationship of the seven independent variables specifically, liquidity risk (LR), credit risk (CR), interest rate risk (IRR), solvency risk (SR), Exchange Rate risk (EER), GDP and Bank Size (BS) with Return on Assets (ROA) of Ethiopian Commercial Banks during the 2005-2018 Study Period

4.5.2. 1. Liquidity Risk (LR)

The Regression Result of the Random Effects Panel Data Model in Table 4.8 revealed that liquidity risk has a positive but significant influence on the return on assets (ROA) of Ethiopian commercial banks during the study period (2005-2018). The relationship is statistically significant at the 5% significant level with a coefficient of (1.775587) when determining the ROA of the Ethiopian commercial banks. Holding other independent variables constant at their average value, when liquidity risk (LR) increased by one percent, the return on assets (ROA) of the selected Ethiopian commercial banks would increase by 177.5587% and statistically significant at 5% of the significance level. In other words, there is a significantly positive relationship between the liquidity risk (LR) and the return on investment (ROA) of the sampled Ethiopian commercial banks. So, the researcher accepts the null hypothesis that there is a positive association among LR and ROA. This means that there is sufficient mark to maintain that positive association among LR and ROA.

Similar to the hypothesis of this research, LR shows a positive relationship with the return on assets (ROA) of the Ethiopian commercial banks included in the sample. The result is inconsistent with the findings of (Yuqi, 2006) (Guru et al, (1999) and (Dawit, 2016). The liquidity risk of the sample of Ethiopian commercial banks included in this study has a significant relationship with the return on assets, as well as many previous studies, for example (Bourke, 1989), (Yuqi, 2006) and (Tobias & Themba, 2011) stated that liquidity is the main cause of bank failure. The likely cause for the negative association among LR and ROA could be the fact that the Ethiopian banking industry holds more cash than it disburses as loans and earns more interest income.

4.5.2.2 Credit Risk (CR)

The regression result of the Random Effects Panels data model of this study in Table 4.8 revealed that credit risk has a negative and significant influence on the ROA of Ethiopian commercial banks for the 2005-2018 study period. The relationship is significant at 5% significant level with a coefficient of (-12.78554) in determining the ROA of Ethiopian commercial banks. This means that if the credit risk (CR) increased by one percent, the return on investment (ROA) of the selected Ethiopian commercial banks would decrease by 1278.554% and statistically significant at 5% of the significance level. The effect is expected to be negative and this negative relationship between performance and credit risk implies that an increase in the credit risk figure leads to a deterioration in performance in terms of ROA. The

result of this study agrees with the results of (Makri et al , 2014), (Boudriga et al., 2009), (Klein, 2013), (Shingjerji, 2013), (Ahmad and Bashir, 2013) and (Hyun and Zhang, 2012) However; it contradicts the statement of (Louzis et al (2012) Therefore, Ethiopian commercial banks should develop their credit risk management capacity considering the practice of other developing countries that have better experience in the industry: the high level of provision for low-yielding assets, mainly loans and advances, is affecting the performance of banks. Therefore, in order to improve performance, a strong credit risk management system must be put in place that can efficiently identify bankable borrowers and a system in place that can monitor their performance after the loan is granted in addition, Ethiopia's regulatory framework should support banks and ensure they have strong policies and credit risk management in place. This can be achieved by strengthening the internal risk management system to assist in the identification, measurement and monitoring of credit risk, as well as to direct the supervisory approach towards credit risk.

4.5.2.3. Interest rate risk (IRR)

The regression result of the Random Effects Panels data model of this study in Table 4.8 revealed that interest rate risk has a negative and insignificant influence on the ROA of Ethiopian commercial banks for the 2005-2018 study periods. The relationship is insignificant at the 5% significant level with a coefficient of (-0.0089667) when determining the ROA of the Ethiopian commercial banks This means that if the interest rate increased by one percent, the return on asset (ROA) of the Ethiopian commercial banks would decrease by 0.90%, and statistically insignificant at 5% level of significance. The finding contradicts the finding of Alper and Anbar (2011). Empirical data from Molyneux and Thornton (1992) indicate that a high interest rate is significantly linked with greater bank profit that is a significant positive association in contrast; Naceur (2003) climaxes a negative association among interest rates and bank profitability.

4.5.2.4. Solvency Risk (SR)

The regression result of the Random Effects Panels data model of this study in Table 4.8 revealed that solvency risk had a positive but insignificant influence on the ROA of Ethiopian commercial banks for the 2005-2018 study periods. The relationship is insignificant at 5% significant level with a coefficient of (5.071952) to determine the ROA of Ethiopian commercial banks the finding of this study suggests that solvency risk has no influence on the performance of Ethiopian commercial banks, as the study was unable to obtain sufficient statistical significance. The finding of this is consistent with the finding of Dawit (2016)

4.5.2. 5.Foreign Exchange Rate Risk (ERR)

The regression result of the Random Effects Panels data model of this study in Table 4 .8 found that the exchange rate risk had a positive and significant impact on the ROA of the Ethiopian commercial banks for the study period 2005-2018 The relationship is insignificant at the 5% significant level with a coefficient of (-0.0365526) when determining the ROA of the Ethiopian commercial banks. This implies that the change in the exchange rate had a negative influence on the performance of Ethiopian commercial banks during the study period. It was found that an increase in the USD on ETB by one birr (devaluation of the Ethiopian birr) led to a decrease in the performance of the Ethiopian commercial banks (ROA) by 3.65526% or a decrease from USD to ETB by one birr (Ethiopian Birr appreciation) caused the yield of Ethiopian commercial banks (ROA) to increase by 3.65526%. The negative relationship between the exchange rate and the financial performance of Ethiopian commercial banks could reveal how inconsistent and unpredictable exchange rates might have assisted to the progression in bank performance This can be attributed to the fact that many imports are paid for by locals using the dollar and, with the birr weakening against the dollar, banks are making an arbitrage profit. The outcome of this research is similar with the findings of Babazadeh and Farrokhnejad, (2012); Osuagwu, (2014); He et al, (2014) and Carolyn (2016)

4.5.2.6 Gross Domestic Product (GDP)

The outcome of the regression displays that the GDP growing rate ensured a statistically insignificant influence on the ROA, the probability 0.278 do not assistance the researcher to discard the null hypothesis and to accept the alternative However, the sign of the coefficient for the real GDP growth rate was positive, similar to the expectation of the researcher 0.0836301 This indicates that the change in GDP to ROA is positive but insignificant. This finding contradicts Carling, Jacobson, Linde and Roszbach (2007), Bonfim (2009), IMF (2000), Jimenez and Saurina (2006), as they report that macroeconomic variables should be included in credit risk analysis since significant influence changes in credit risk at the aggregate level

4.5.2.7. Bank Size

The last bank-specific factor for this BS study results in table 4.8 above shows that there is a positive and statistically insignificant impact of bank size on ROA The result shows a positive coefficient of 0.095358 and a p-value of 0.446 This indicates that at a significance level of 5%, bank size is an insignificant factor in bank performance .This implies that for a

unit change in BS, keeping the other things constant resulted in 0.45 Unit changes on the ROA level in the same direction This result agrees with the finding of Akhavein et al. (1997); Bourke (1989); Molyneux and Thornton (1992); Bikker and Hu (2002); Goddard et al., (2004).

Table 4.9 Table of expected relationship and actual result

Independent Variables	Measurement formula	Predicted Associations with ROA	Actual result	Statistical Significance test	Hypothesis Position
Liquidity Risk	Current asset ÷ current liability	+	+	Significant at 5%	supported
Credit Risk	LLP ÷ Total Loans	-	-	Significant at 5%	supported
Interest rate risk	Nominal interest - inflation	+	-	insignificant	Reject
Solvency Risk	capital ÷ total asset	+	+	insignificant	Reject
Foreign exchange rate risk	ETB to US dollar	+	-	insignificant	Reject
Gross Domestic Product	Real annual GDP	+	+	insignificant	Reject
Bank size	Log of total asset	+	+	insignificant	Reject

CHAPTER FIVE

5. Summary, Conclusions and Recommendations

This chapter presents a summary of the main work, conclusions of key findings, the recommendations that forwarded by the researcher and direction for future research.

5.1. Summary

The over-all objective of this research is to examine the impact of financial risks on the performance of Ethiopian commercial banks (EBC). The research included data from seven banks for the year 2005-2017. To achieve the intended objective, the research used secondary sources. In addition, the research used a regression model with a random effect panel for seven study variables: liquidity risk, credit risk, interest rate risk, solvency risk, exchange rate risk, GDP and bank size. Regarding the raw data that was used to calculate liquidity risk, solvency risk, bank size and credit risk were collected from the audited financial statements (annual reports) of the head office of the Ethiopian commercial banks including In the sample and the raw data that was used to calculate the interest rate risk, GDP and exchange rate risk were found from the annual report of the Ministry of Finance and the NBE. The results of the study were calculated with STATA version 14.2. Data were analysed using descriptive statistics / multiple regression models, in doing so, the random effects panel regression model used to measure estimators and then the CLRM tests were done and all the data fit the assumptions; It was found that the data were homoskedasticity, free of autocorrelation, free of multicollinearity and normally distributed. Finally, the results of the random effect regression were presented and analysed; therefore, the findings of this study showed that credit risk and liquidity risk were statistically significant, while solvency risk, interest rate risk, exchange rate risk; GDP and bank size had insignificant effect on the performance of the sampled Ethiopian commercial banks. In addition to this, the findings of this study revealed that credit risks, interest rate risk and exchange rate risk have a negative coefficient. However, the remaining independent variables have a positive coefficient finally; the coefficient of the total R-sq. value is 38. 27% indicate that the dependent variable of the return on assets of the sampled Ethiopian commercial banks was not well explained by the seven independent variables listed in the model since it is below 50%.

5.2. Conclusions of Key Findings

According to the regression result of the panel data model with random effects, only credit risk and liquidity risk as a negative and positive relationship consecutively have a statistically significant effect on the ROA, while the other variables are not statistically significant, but have a negative / positive effect on financial performance measured by return on asset as of the banks. For that reason, the main financial risks that affect the performance of the sampled Ethiopian commercial banks are credit risk and liquidity risk, which have a statistically significant impact at 99% and 95% confidence levels. This conclusion indicates that any increase / decrease in liquidity risk, solvency risk, GDP, and bank size leads to an increase / decrease in financial performance of the sampled commercial banks (ROA). While credit risk has a significant impact on ROA with a negative relationship; meaning that any decrease / increase in the value of this variable leads to an increase / decrease in the financial performance of commercial banks (ROA) whereas liquidity risk is a positive and significant impact on ROA. However, interest rate risk, solvency risk, exchange rate risk, GDP and bank size do not have a significant effect on the performance (ROA) of the sample of Ethiopian commercial banks

5.3. Recommendations

Based on the research findings the following reachable recommendations were forwarded; Credit risk has a negative and significant effect on the return on asset of the banks. Thus, to overcome this problem the Ethiopian commercial banks should evaluate the borrowers' historical and projected cash flows and adequate collateral margins in order to improve financial performance. In addition, it is strongly recommended that the bank needs to maintain substantial amount of capital reserve to absorb credit risk in event of failure, the bank also needs to enhance lending criteria, portfolio grading and credit mitigation techniques to reduce chance of default. Besides to this, the Ethiopian commercial banks should put rigorous measure once conducting loan appraisal process and should adhere to all the lending requirements stipulated in order to enhance financial performance. Furthermore, the study strongly recommended that the banks need to come with credit policies and devise strategies that not only limit the banks' exposition to credit risk but also establish a proper credit risk management strategy by conducting sound credit evaluation before granting loans to customers. Therefore, this study recommends that the banks to closely monitor credit

advances and adopt other appropriate steps necessary to control or mitigate the risk Ethiopian commercial banks management should enhance the construction of employee teams through providing training and seminars to improve the business knowledge this will ensure effective risk identification and assessment is carried out before disbursement of credit to creditors mitigates the occurrence of credit risk and improves financial performance There is a necessity aimed at banks to take on credit risk administration put into practise Such performs consist of ensuring sufficient collaterals, creditworthiness of the borrower, limiting lending to various kinds of businesses (diversification of loans), loan securitization and ensuring clear assessment framework of lending facilities Finally, the regulatory framework of Ethiopian commercial banks should support and make sure banks to have strong policy and credit risk management practice This can be done through strengthening the internal risk management system to assist the identification, measurement and monitoring of credit risk as well as directing of the supervision focus towards credit risk.

Based on the findings and conclusion of the study, this study strongly recommends to the Ethiopian government and National Bank of Ethiopia regarding the issues related to foreign exchange rate should always be taken into account in efforts to improve banks' foreign exchange transactions and financial performance of the Ethiopian commercial banks Adequate measures and policies, strategies and measures should be formulated to check the level of foreign exchange This could be through deflation of local currency relative to foreign currencies or adoption of fixed exchange rate regimes On the other hand, should adopt appropriate risk management strategies like hedging and forwards as it regards fluctuation in exchange rates

Regulatory body like central bank of Ethiopia must device comprehensive strategies and procedures to retain interest rates in the banking sector economy as a result, central bank of Ethiopia ought to reinforce on its monetary policies to normalize the level of lending rate of interest in an economy

Based on the findings and conclusions of the study, this study strongly recommends to the National Bank of Ethiopia appropriate government expenditure, taxation, money supplies and interest rate policies which is in general called fiscal and monetary policies should be applied to regulate the level of general inflation.

Liquidity risk was one of the factors that can affect the ROA of Ethiopian banks positively since inability to appropriately administer liquidity can rapidly cause in substantial unexpected losses Therefore; Ethiopian banks should have optimal level of liquidity which enables banks to meet their contractual commitments

The size of large banks should be reduced to optimum levels-even if it is insignificant; the size of the bank seems to correlate positively with ROA The large capacity of banks to provide efficient banking services.

commercial banks must take into account inner and external economic variables in their design strategy The research considers that the real progress percentage of GDP, which measures Ethiopia's economic growth, has had a positive but insignificant impact happening towards performance of banks The results in this way indicate that banks react to the changing aspects of economic growing that will be taken as a sign of effective rivalry and efficacy in the banking area.

5. 4. Direction for further researcher (s) and Limitations of the study

This study only focused on the effects of financial risks on the performance of Ethiopian Commercial banks (EBCs) over the study period of 2005 to 2018. However, it is recommended for further study can be extended by including more variables which is statistically significant for ROA and also by including other new bank specific variables other than included in this study.

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Appendices

Appendix 1 summary of regression

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	98	2.983282	.7397001	.3802533	4.684208
LIQUIDITYR~K	98	.396874	.1842885	.0591852	.8018894
CREDITRISK	98	.031638	.0328442	0	.2116995
INTERESTRA~K	98	-3.257143	9.867683	-24.15	9.45
SOLVENCYRISK	98	.1197292	.0365335	.0206568	.1921772
FOREGINEXC~K	98	17.03207	6.151343	8.681	28.0543
GDP	98	10.04071	1.243921	7.7	11.8
banksizelog	98	9.456968	1.329504	6.978214	13.34561

Appendix 2 Correlation matrix

```
. corr ROA LIQUIDITYRISK CREDITRISK INTERESTRATERISK SOLVENCYRISK FOREGINEXCHANGERISK GDP banksize
> Log
(obs=98)
```

	ROA	LIQUID~K	CREDIT~K	INTERE~K	SOLVEN~K	FOREGI~K	GDP	banksi~g
ROA	1.0000							
LIQUIDITYR~K	0.3372	1.0000						
CREDITRISK	-0.1174	0.6060	1.0000					
INTERESTRA~K	-0.2287	-0.3760	-0.2461	1.0000				
SOLVENCYRISK	0.3593	0.1456	-0.2932	0.0196	1.0000			
FOREGINEXC~K	-0.2680	-0.6207	-0.5803	0.4197	0.1010	1.0000		
GDP	0.2046	0.4565	0.4537	-0.0285	-0.0934	-0.7395	1.0000	
banksizelog	-0.3401	-0.5225	-0.1716	0.2578	-0.4881	0.6417	-0.4969	1.0000

Appendix 3 OLS regression result

```
. reg ROA LIQUIDITYRISK CREDITRISK INTERESTRATERISK SOLVENCYRISK FOREGINEXCHANGERISK GDP banksizeL
> og /* ols*/
```

Source	SS	df	MS	Number of obs	=	98
Model	20.7091447	7	2.95844924	F(7, 90)	=	8.23
Residual	32.3650142	90	.359611269	Prob > F	=	0.0000
				R-squared	=	0.3902
				Adj R-squared	=	0.3428
Total	53.0741589	97	.547156277	Root MSE	=	.59968

ROA	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
LIQUIDITYRISK	1.685867	.5194024	3.25	0.002	.6539836 2.717751
CREDITRISK	-12.31032	2.822572	-4.36	0.000	-17.91785 -6.702789
INTERESTRATERISK	-.009123	.0078172	-1.17	0.246	-.0246531 .0064071
SOLVENCYRISK	7.190644	2.527078	2.85	0.005	2.170161 12.21113
FOREGINEXCHANGERISK	-.0488469	.0236925	-2.06	0.042	-.0959161 -.0017777
GDP	.0907597	.082548	1.10	0.274	-.0732362 .2547556
banksizelog	.1818612	.0891204	2.04	0.044	.0048078 .3589145
_cons	.0138504	1.443334	0.01	0.992	-2.853584 2.881285

Appendix 4 Fixed effect regression

```
. xtreg ROA LIQUIDITYRISK CREDITRISK INTERESTRATERISK SOLVENCYRISK FOREGINEXCHANGERISK GDP banksiz
> eLog, fe /* fixed effect*/
```

```
Fixed-effects (within) regression      Number of obs   =      98
Group variable: company                Number of groups =       7
```

```
R-sq:                                  Obs per group:
  within = 0.3637                        min =      14
  between = 0.3306                       avg =     14.0
  overall = 0.2816                       max =      14
```

```
corr(u_i, Xb) = -0.6272                  F(7,84)         =      6.86
                                          Prob > F        =     0.0000
```

ROA	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
LIQUIDITYRISK	1.856948	.4963794	3.74	0.000	.8698429 2.844053
CREDITRISK	-13.72503	2.839333	-4.83	0.000	-19.37136 -8.078707
INTERESTRATERISK	-.0086779	.0072853	-1.19	0.237	-.0231655 .0058097
SOLVENCYRISK	4.288812	3.080677	1.39	0.168	-1.837451 10.41508
FOREGINEXCHANGERISK	.0055209	.0403513	0.14	0.891	-.0747221 .0857639
GDP	.0652339	.0781448	0.83	0.406	-.0901655 .2206333
banksizelog	-.2359051	.2813626	-0.84	0.404	-.7954255 .3236154
_cons	3.620699	2.515329	1.44	0.154	-1.381309 8.622706
sigma_u	.48446598				
sigma_e	.55816312				
rho	.42966745	(fraction of variance due to u_i)			

```
F test that all u_i=0: F(6, 84) = 3.31      Prob > F = 0.0056
```

Appendix 5 random effect GLS regression

```
. xtreg ROA LIQUIDITYRISK CREDITRISK INTERESTRATERISK SOLVENCYRISK FOREGINEXCHANGERISK GDP banksiz
> eLog, re /* fixed effect*/
```

```
Random-effects GLS regression      Number of obs   =      98
Group variable: company            Number of groups =       7
```

```
R-sq:                                  Obs per group:
  within = 0.3530                        min =      14
  between = 0.4850                       avg =     14.0
  overall = 0.3827                       max =      14
```

```
corr(u_i, X) = 0 (assumed)             Wald chi2(7)    =     51.04
                                          Prob > chi2     =     0.0000
```

ROA	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
LIQUIDITYRISK	1.775587	.4926164	3.60	0.000	.8100761 2.741097
CREDITRISK	-12.78554	2.742833	-4.66	0.000	-18.1614 -7.409688
INTERESTRATERISK	-.0089667	.0072933	-1.23	0.219	-.0232612 .0053278
SOLVENCYRISK	5.071952	2.828743	1.79	0.073	-.4722829 10.61619
FOREGINEXCHANGERISK	-.0365526	.0250939	-1.46	0.145	-.0857358 .0126306
GDP	.0836301	.0771593	1.08	0.278	-.0675993 .2348594
banksizelog	.095358	.1250294	0.76	0.446	-.1496952 .3404112
_cons	.9277038	1.580934	0.59	0.557	-2.170869 4.026277
sigma_u	.25950539				
sigma_e	.55816312				
rho	.17773814	(fraction of variance due to u_i)			

Appendix 16 overall data of variables used in the study

year	ROA	LIQUIDITY RISK	CREDIT RISK	INTEREST RATE RISK	SOLVENCY RISK	FOREGIN EXCHANGE RISK	GDP%	bank size(mill)	bank size(Log)	bank
2005	1.90	0.45	0.06	-0.10	0.10	8.68	11.50	2226.00	7.71	AWASH
2006	3.01	0.36	0.05	-5.30	0.10	8.79	11.80	2954.00	7.99	AWASH
2007	4.22	0.36	0.04	-13.80	0.11	9.24	11.20	3830.00	8.25	AWASH
2008	3.30	0.48	0.05	-24.15	0.12	10.42	10.00	4820.22	8.48	AWASH
2009	2.54	0.64	0.05	9.45	0.12	12.89	10.57	6422.55	8.77	AWASH
2010	3.45	0.66	0.05	-6.22	0.12	16.12	11.40	7944.78	8.98	AWASH
2011	3.99	0.52	0.04	-22.22	0.13	17.25	8.70	10115.78	9.22	AWASH
2012	3.58	0.34	0.03	-1.62	0.13	18.19	9.90	11936.68	9.39	AWASH
2013	3.79	0.28	0.02	3.78	0.14	19.07	10.30	14858.82	9.61	AWASH
2014	3.54	0.34	0.02	4.18	0.13	20.10	10.40	20028.79	9.90	AWASH
2015	3.02	0.15	0.02	3.05	0.14	21.11	8.00	22735.20	10.03	AWASH
2016	2.84	0.25	0.02	5.35	0.13	22.41	10.10	29609.60	10.30	AWASH
2017	2.80	0.23	0.01	1.10	0.11	26.11	7.70	41974.86	10.64	AWASH
2018	3.07	0.27	0.01	0.90	0.09	28.05	9.00	55268.10	10.92	AWASH
2005	1.87	0.70	0.21	-0.10	0.04	8.68	11.50	33169.00	10.41	CBE
2006	2.32	0.75	0.18	-5.30	0.04	8.79	11.80	35849.00	10.49	CBE
2007	2.18	0.78	0.14	-13.80	0.10	9.24	11.20	43456.00	10.68	CBE
2008	2.90	0.47	0.06	-24.15	0.09	10.42	10.00	50416.11	10.83	CBE
2009	3.50	0.36	0.03	9.45	0.08	12.89	10.57	59411.45	10.99	CBE
2010	2.95	0.29	0.02	-6.22	0.07	16.12	11.40	74186.91	11.21	CBE
2011	3.04	0.36	0.02	-22.22	0.05	17.25	8.70	114264.93	11.65	CBE
2012	3.98	0.22	0.02	-1.62	0.05	18.19	9.90	158814.43	11.98	CBE
2013	3.43	0.23	0.03	3.78	0.05	19.07	10.30	197104.24	12.19	CBE
2014	3.06	0.16	0.03	4.18	0.04	20.10	10.40	240408.42	12.39	CBE

2015	1.88	0.06	0.01	3.05	0.02	21.11	8.00	625061.57	13.35	CBE
2016	1.64	0.11	0.00	5.35	0.04	22.41	10.10	383852.77	12.86	CBE
2017	2.00	0.15	0.00	1.10	0.09	26.11	7.70	490068.24	13.10	CBE
2018	1.01	0.12	0.04	0.90	0.08	28.05	9.00	573894.28	13.26	CBE
2005	2.33	0.36	0.03	-0.10	0.07	8.68	11.50	3420.00	8.14	DASHEN
2006	3.34	0.31	0.03	-5.30	0.08	8.79	11.80	4546.00	8.42	DASHEN
2007	3.53	0.34	0.02	-13.80	0.09	9.24	11.20	6041.00	8.71	DASHEN
2008	3.45	0.47	0.02	-24.15	0.09	10.42	10.00	7828.59	8.97	DASHEN
2009	2.85	0.59	0.02	9.45	0.09	12.89	10.57	9732.58	9.18	DASHEN
2010	2.93	0.52	0.02	-6.22	0.09	16.12	11.40	12353.38	9.42	DASHEN
2011	3.34	0.53	0.02	-22.22	0.10	17.25	8.70	14659.79	9.59	DASHEN
2012	4.05	0.41	0.02	-1.62	0.10	18.19	9.90	17520.04	9.77	DASHEN
2013	3.26	0.38	0.02	3.78	0.10	19.07	10.30	19747.17	9.89	DASHEN
2014	3.42	0.37	0.00	4.18	0.12	20.10	10.40	21962.20	10.00	DASHEN
2015	3.28	0.17	0.02	3.05	0.13	21.11	8.00	22536.00	10.02	DASHEN
2016	2.84	0.30	0.02	5.35	0.12	22.41	10.10	28576.43	10.26	DASHEN
2017	2.39	0.19	0.02	1.10	0.12	26.11	7.70	34624.60	10.45	DASHEN
2018	2.32	0.20	0.01	0.90	0.13	28.05	9.00	45425.38	10.72	DASHEN
2005	3.35	0.47	0.05	-0.10	0.12	8.68	11.50	2057.00	7.63	ABYSINIA
2006	3.48	0.36	0.03	-5.30	0.14	8.79	11.80	2834.00	7.95	ABYSINIA
2007	2.15	0.38	0.05	-13.80	0.12	9.24	11.20	3396.00	8.13	ABYSINIA
2008	0.38	0.41	0.09	-24.15	0.10	10.42	10.00	4269.94	8.36	ABYSINIA
2009	2.06	0.60	0.10	9.45	0.09	12.89	10.57	5476.62	8.61	ABYSINIA
2010	2.39	0.58	0.07	-6.22	0.09	16.12	11.40	6279.54	8.75	ABYSINIA
2011	2.67	0.48	0.03	-22.22	0.09	17.25	8.70	7277.96	8.89	ABYSINIA
2012	2.79	0.37	0.03	-1.62	0.11	18.19	9.90	8239.51	9.02	ABYSINIA
2013	2.36	0.23	0.02	3.78	0.11	19.07	10.30	10129.37	9.22	ABYSINIA
2014	4.18	0.30	0.00	4.18	0.14	20.10	10.40	11276.39	9.33	ABYSINIA

2015	2.38	0.52	0.00	3.05	0.14	21.11	8.00	13220.01	9.49	ABYSINIA
2016	2.40	0.23	0.00	5.35	0.13	22.41	10.10	16828.06	9.73	ABYSINIA
2017	2.71	0.17	0.00	1.10	0.11	26.11	7.70	25324.80	10.14	ABYSINIA
2018	1.96	0.17	0.01	0.90	0.13	28.05	9.00	31984.06	10.37	ABYSINIA
2005	3.55	0.56	0.04	-0.10	0.12	8.68	11.50	1073.00	6.98	UNITED
2006	3.29	0.49	0.03	-5.30	0.12	8.79	11.80	1599.00	7.38	UNITED
2007	3.38	0.49	0.03	-13.80	0.16	9.24	11.20	2182.50	7.69	UNITED
2008	3.35	0.57	0.03	-24.15	0.14	10.42	10.00	3249.96	8.09	UNITED
2009	2.37	0.69	0.03	9.45	0.11	12.89	10.57	4651.70	8.44	UNITED
2010	3.31	0.69	0.04	-6.22	0.11	16.12	11.40	5896.23	8.68	UNITED
2011	3.40	0.59	0.03	-22.22	0.12	17.25	8.70	7725.62	8.95	UNITED
2012	3.61	0.42	0.02	-1.62	0.13	18.19	9.90	8786.86	9.08	UNITED
2013	2.28	0.26	0.02	3.78	0.12	19.07	10.30	9977.67	9.21	UNITED
2014	1.81	0.38	0.01	4.18	0.13	20.10	10.40	11876.37	9.38	UNITED
2015	2.20	0.18	0.01	3.05	0.12	21.11	8.00	13749.01	9.53	UNITED
2016	2.19	0.22	0.01	5.35	0.12	22.41	10.10	17269.87	9.76	UNITED
2017	1.95	0.19	0.01	1.10	0.11	26.11	7.70	21902.92	9.99	UNITED
2018	2.30	0.20	0.01	0.90	0.11	28.05	9.00	28030.93	10.24	UNITED
2005	3.48	0.48	0.05	-0.10	0.11	8.68	11.50	1616.00	7.39	WEGAGEN
2006	3.66	0.37	0.05	-5.30	0.11	8.79	11.80	2259.00	7.72	WEGAGEN
2007	3.90	0.48	0.04	-13.80	0.12	9.24	11.20	3480.00	8.15	WEGAGEN
2008	3.65	0.61	0.06	-24.15	0.15	10.42	10.00	4124.89	8.32	WEGAGEN
2009	3.91	0.78	0.06	9.45	0.16	12.89	10.57	5118.31	8.54	WEGAGEN
2010	4.11	0.72	0.04	-6.22	0.18	16.12	11.40	5741.93	8.66	WEGAGEN
2011	4.68	0.70	0.05	-22.22	0.17	17.25	8.70	8061.05	8.99	WEGAGEN
2012	4.10	0.45	0.02	-1.62	0.19	18.19	9.90	8347.15	9.03	WEGAGEN
2013	3.66	0.34	0.02	3.78	0.18	19.07	10.30	10393.80	9.25	WEGAGEN
2014	2.82	0.21	0.02	4.18	0.19	20.10	10.40	11242.58	9.33	WEGAGEN

2015	2.87	0.21	0.00	3.05	0.18	21.11	8.00	13317.74	9.50	WEGAGEN
2016	2.55	0.28	0.00	5.35	0.17	22.41	10.10	16189.16	9.69	WEGAGEN
2017	2.87	0.28	0.00	1.10	0.16	26.11	7.70	20949.16	9.95	WEGAGEN
2018	3.28	0.20	0.02	0.90	0.14	28.05	9.00	27390.91	10.22	WEGAGEN
2005	3.09	0.46	0.04	-0.10	0.13	8.68	11.50	1732.00	7.46	NIB
2006	3.09	0.37	0.04	-5.30	0.14	8.79	11.80	2027.00	7.61	NIB
2007	3.28	0.46	0.03	-13.80	0.16	9.24	11.20	2607.00	7.87	NIB
2008	3.61	0.63	0.04	-24.15	0.16	10.42	10.00	3650.11	8.20	NIB
2009	3.63	0.77	0.05	9.45	0.15	12.89	10.57	4806.50	8.48	NIB
2010	3.73	0.80	0.04	-6.22	0.15	16.12	11.40	5970.51	8.69	NIB
2011	3.77	0.74	0.04	-22.22	0.16	17.25	8.70	7111.52	8.87	NIB
2012	3.72	0.54	0.03	-1.62	0.18	18.19	9.90	8275.70	9.02	NIB
2013	3.44	0.37	0.03	3.78	0.18	19.07	10.30	9144.54	9.12	NIB
2014	2.99	0.27	0.00	4.18	0.18	20.10	10.40	10747.28	9.28	NIB
2015	2.83	0.20	0.00	3.05	0.17	21.11	8.00	13111.63	9.48	NIB
2016	2.69	0.28	0.00	5.35	0.16	22.41	10.10	15830.38	9.67	NIB
2017	2.41	0.24	0.00	1.10	0.14	26.11	7.70	21019.71	9.95	NIB
2018	2.16	0.22	0.00	0.90	0.13	28.05	9.00	26688.92	10.19	NIB