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

By: Meselech Amsalu

Advisor: Habatmu Berhanu(PhD)

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

Addis Ababa

Feb, 2019

Declaration

I,Meselech Amsalu Worku hereby declare 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 degree of Master of Science in Accounting and Finance at Addis Ababa University is my original work and it has never been presented in any university. All sources and materials used for this thesis have been duly acknowledged.

Name: Meselech Amsalu Worku

Signature:_____

Certification

Addis Ababa University

This is to certify that the thesis prepared by Meselech Amsalu entitled **"**effects of financial risk on the financial performance of Ethiopian Commercial banks" submitted in partial fulfillment of the requirements for the degree of Master of Science in Accounting and Finance compiles with the regulations of Addis Ababa University and meets the accepted standards with respect to originality and quality.

Approved by:

Internal Examiner_____ Signature _____Date_____

External Examiner_____Signature_____ Date_____

Advisor

Habtamu Berhanu (PhD) _____Signature _____Date_____

Acknowledgment

My deepest and heartfelt thank goes to the Almighty God and his mother St. Marry, who follow me in all aspect of my life.

First, I would like express my deepest gratitude to my advisor, Habtamu Berhanu ***(PhD)***, for his support, encouragement, invaluable comments, advice and guidance at various stages of my study. Thank you very much!!!

I would also like to extend my deepest gratitude for of Addis Ababa University for spending its valuable time during the model specification stage of the study as well the assistance during the analysis stage of the study.

I am grateful to the staff of the Commercial Bank of Ethiopia for their support in directing me in the right direction during the data gathering process.

I would also like to convey my sincere thanks to my parents, whose unconditional love and silent prayers encouraged and protect me throughout my life.

Last but not least I thank the late Asmare Emire(PhD) for his valuable advice and encouragement to join this program.

List of Acronyms/Abbreviations

AIB---------- Awash International Bank

BOA---------- Bank of Abyssinia

CBE----------Commercial bank of Ethiopia

CR ---------- Credit Risk

DB---------- Dashen Bank

EBCs ---------- Ethiopian Commercial banks

ERR ---------- Foreign Exchange Rate Risk

Inf. RR---------- Inflation rate risk and

IRR---------- Interest rate risk

LR---------- Liquidity Risk,

MoFED---------- Ministry of Finance and Economic Development

NBE----------National Bank of Ethiopia

NIB----------Nib International Bank

ROA---------- Return of Asset

SR---------- Solvency Risk

UB---------- United Bank

WB---------- Wogagen Bank

Abstract

This study aimed to identify effects of financial risk on the performance of Ethiopian Commercial banks over the period from 2000 to 2017. The study used secondary data that bank specific data were obtained from the audited financial statements of the sampled Ethiopian commercial banks head office. Additionally, and Macroeconomic data used from MoFED. Besides to this, balanced panel data were employed in the study. Thus, by employing purposive sampling method only seven commercial banks out of seventeen commercial banks operating in Ethiopia were included in this study. Besides to this, the study used ROA as a dependent variable and liquidity risk, solvency risk, credit risk, interest rate risk, inflation rate risk and foreign exchange rate risk as independent variables. At the end, the empirical results of random effects panel data model regression revealed that interest rate risk, inflation rate risk and foreign exchange rate risk have statistically significant impact and positive influence on ROA, while credit risk has statistically significant and negative influence on the financial performance (ROA) of the Ethiopian commercial banks. Therefore, the banks should adopt credit risk management practices and National bank of Ethiopia should implement sound policies and measures of interest rates in the economy and proper fiscal and monetary policies should be enforced to control the level of inflation in an economy.

Keywords:*Financial risk, performance, commercial banks, interest rate risk, inflation, foreign exchange risk and credit risk*

Table of Contents

CHAPTER ONE

1. INTRODUCTION

This chapter deals with introduction of the study which consists of background of the study, statement of the problem, the objectives of the study, hypothesis of the study, significance of the study, scope of the study, limitations of the study, and organization of the paper.

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, particularity the banking sector is mobilizing resources from those who have excess supply especially in the form of saving deposits and channeling 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 whichcompanies 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 development of any country depends on the existence of well-organized financial system. The aforementioned is possible because it is the financial system that could provide inputs for the production of goods and provision of service that in turn will affect the standard of living of nations. The financial system is a complex system that consists of financial institutions, financial markets and instruments. The main role of a financial system is to lubricate the gears facilitating the economic operations. The banking system plays a major role in transferring funds from the saving units to the investing units. If a financial system is efficient, it should show improvements in profitability, increasing the volume of funds flowing from saver to borrowers, and better-quality services for consumers (Levine et al., 2000).

The financial intermediation provided by the banking sector supports economic acceleration by converting deposits into productive investments (Levine et al., 2000). A bank is a financial institution that provides banking and other financial services to its customers. A bank is generally understood as an institution which provides fundamental banking services such as accepting deposits and providing loans. There are also nonbanking institutions that provide certain banking services without meeting the legal definition of a bank. All the banks safeguard the money and valuables and provide loans, credit, and payment services, such as checking accounts, money orders, and cashier's cheques. The banks also offer investment and insurance products. Banks as financial institutions particularly provide unique function in an economy by bridging saving and investment activities. In the course of the desire to operate profitably, the banking sector acts as an engine in enhancing modern trade and commerce for business firms and individual traders (Melaku, 2016). However, in Ethiopia the financial sector remains closed and is much less developed compared with sub-Saharan countries (Habtamu, 2013).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 Ethiopiaconcerning the determinants commercial banksperformance 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 includeinterest rate risk, credit risk and foreign exchange rate risk. Finally, Enyew (2013)Samuel (2015) didn't include interest rate and credit risks.

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) implythat inflation didn'thavesignificant effect on performance of commercial banks.Nevertheless, Sufian (2008) confirms that inflation had a significant and negative impact on performance of commercial banks. In the contrary, there are studies that found a positive and significant effect of inflation on commercial banks performance, such as the findingbyLelissa, 2014; Athanasoglou et al., 2008; Guru et al., 2002; Demirgüç-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 Ethiopian studies indicate various out comes while using the same variables to examine the determinants of performance of commercial banks.This reveals that there is no consistency in the banking literature on the determinants of bank performance.Also, none of the above Ethiopian banking performance studies include variable like interest rate risk.

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, due to the severity of financial risk problem and absence of empirical studies on Ethiopian Commercial banks pertaining to this topic incorporating crucial financial risk variables such as interest rate riskand others are motivated the researcher to examine the impact of financial risk on the performance of Ethiopian commercial banksfrom 2000 to 2017.Finally, this study not only fills the literature gap but also tries to answer the following question.What are the financial risk factors that affect the performance of Ethiopian Commercial banks?

1.3.Objective of the study

1.3.1. General objective

The overall objective of the study is to analyze effects of financial risks on the performance of Ethiopian Commercial banks (EBCs).

1.3.2. Specific Objectives

Besides, to the above main objective, the study has the following specific objectives.

- To explorethe influence of credit riskon the performance of Ethiopian Commercial banks.
- To find out the effect of liquidity riskon the performance of Ethiopian Commercial banks.
- To investigate the effects of solvency risk on the performance of Ethiopian Commercial banks.
- To analyze the impact of foreign exchange rate riskon the performance of Ethiopian Commercial banks.
- To examine the effects of interest rate risk on the performance of Ethiopian Commercial banks.
- To scrutinize the influenceofinflation rate risk on the performance of Ethiopian Commercial banks.

1.4.Research hypothesis

In many quantitative studies, writers used research questions. However, a more formal statement of research employs hypotheses. These hypotheses are predictions about the outcome of the

results, and they may be written as alternative hypotheses specifying the exact results to be expected (more or less, higher or lower of something). They also may be stated in the null form, indicating no expected difference or no relationship between groups on a dependent variable (Creswell 2009).

Therefore, in order to achieve the objective of the study, the following hypotheses were developed regarding the effect of financial risk on the performance of Ethiopian commercial banksbased on different empirical research and theoretical reviewed made.

H1: liquidity risk has a negative and significant impact onthe performance of Ethiopian commercial banks

H2: solvency risk has a positive and significant impact onthe performance of Ethiopian commercial banks

H_3: credit risk has a negative and significant impact onthe performance of Ethiopian commercial banks

H_4: interest rate risk has a positive and significant impact onthe performance of Ethiopian commercial banks

H_5: inflation rate risk has a negative and significant impact onthe performance of Ethiopian commercial banks.

H_6: foreign exchange rate risk has a positive and significant impact onthe performance of Ethiopian commercial banks

1.5.Scope of the Study

The study was delimited on the effect of financial risk on performance of commercial banks in Ethiopia and made the analysis using secondary source of data. The study takes in to account the performance of commercial banks for the last 18 years that is from 2000 to 2017. As a result, the study included banks that started operation before 2000, which include one government owned commercial bank and six private commercial banks in Ethiopia.

1.6.Significant of the Study

Many parties will be benefited from the findings that emerged from the results of the study and these are the following organ that will be benefited; **Management:** Administration could be interested in identifying indicators of success and failure to take the necessary actions to improve the performance of the bank and choose the right decisions. **Government:** Government might be concerned in knowing which banks operate successfully or failed to take the necessary measures

so as to avoid crises of the bankruptcy in these banks. **Investors:** Investors could be fascinated in such studies in order to protect their investment and directing it to the best investment. **Customers:** Customers may possibly involve in knowing the ability of the banks to pay their obligations based on the indicators of success of the banks.

The key findings of this study will be beneficial to the financial institutions of Ethiopia particularly for the banking industry. This study provides a good insight for the policy makers and after studying this study, they will be able to develop understanding regarding general risk management practices. Moreover, they will be also enabling to know, how the risk management practices influence the financial performance of Ethiopian commercial banks. This study will be of great beneficial for the manager especially at the time of framing risk management strategies.

Academician: in addition, the study will be of great useful for academia by adding information in existing body of literature. Academicians could have a chance to know the severity of financial risk problem on Ethiopian commercial banks which support students to be familiar with it and find out a solution on their teaching and learning process. Moreover, this research will have significant role to play in shading light on how to better understand what variables that have an impact on Ethiopia commercial banks performance. Additionally, this study will have a paramount importance in providing a better ground for bank managers, business professionals, business initiatives and policy makers. Moreover, the research will also contribute an insight point as a stepping stone for further study in this area to future researchers.

1.7.Structure of the study

The study organizes in to five chapters. Chapter one is an introduction part which background of the study, statement of the problem, objectives of the study, scope, significance and limitation of the study were presented. Chapter two is review of literature in which theories, empirical evidence and conceptual frame work were identified. Chapter three contained research methodology where research design, research approach, population, sampling method, sample size, sources of data, instruments, data analysis technique, model specification, description and operationalizations of the study variableswere covered. Chapter 4 dealt with data analysis and presentation. And the final chapter presents about conclusion and recommendation.

CHAPTER TWO

2. LITERATURE REVIEW

This section presents theoretical and empirical review on the effect of financial risk on Ethiopian commercial banks' performance. Accordingly, the first part presented theoretical literature about different financial risks in commercial banksand also explained risk management theory. Next to these, it presents the relationship between financial risks and banks' performance. The second part discussed about various empirical studies. The gaps in existing literature described in the third part and the conceptual framework depicted in the fourth part

1.8.Theoretical literature review

1.8.1. Meaning of risk

According to Ralph (2000) riskdefinedas the existence of uncertainty about future outcomes. Risk is a key factor in economic life because people and firms make irrevocable investments in research and product development, plant and equipment, inventory, and human capital, without knowing whether the future cash flows from these investments will be sufficient to compensate both debt and equity holders. If such real investments do not generate their required returns, then the financial claims on these returns will decline in value.

1.8.2. Meaning of financial risk

According to Holton (2004) financial risk is often defined as the unexpected variability or volatility of returns and thus includes credit risks, liquidity risks and market risks. In line with this, Kithinji (2010) also stated that financial risk management practices are those activities and procedures that are employed by managers in an effort of safeguarding an organization from credit risks, liquidity risks and market risks. Financial risk management practices fall into three major categories; credit risk practices, liquidity risk management practice and market risks.

1.1.1. Credit risk

As stated by Anthony et al. (1997) it is the risk that a borrower will not perform in accordance with its obligations. Credit risk may arise from either an inability or unwillingness on the part of the borrower to perform in the pre-committed contracted manner. In addition, Gerald et al. (2001) mentioned that credit risk basically means the risks that counterparty cannot meet its liabilities. Even if counterparty does manage to meet its liabilities, the value of a given item may

decline if its rating is downgraded. Consequently, the commercial banks will be subject to credit risk whenever changes in the economic policy framework entail adverse changes in the creditworthiness of invested assets. Mortgages as well are subject to credit risk, which must be adequately assessed by means of internal ratings. When managing credit risk, commercial banks must primarily look to avoid concentration risk (e.g. concentration of investments in a particular investment category, low degree of portfolio diversification) and strive to achieve as much diversification in their investments as possible.

Coyle (2000) defines credit risk as losses from the refusal or inability of credit customers to pay what is owed in full and on time. It arises mainly from direct lending and certain off-balance sheet products such as guarantees, letters of credits, foreign exchange, forward contracts and derivatives and also from the bank's holding of assets in the form of debt securities. It may take the form of delivery or settlement risk. It is critical to bank survival or failure because banks traditionally earn their huge profits from interest on their risk exposures. The management of credit risk is a critical component of a comprehensive approach to risk management and is essential to the long-term success of a commercial bank.

Credit risk is a financial exposure resulting from a bank's dependence on another (counterparty) to perform an obligation as agreed (National Bank of Ethiopia, 2010).Credit risk, as defined by the Basel Committee on Banking Supervision (2001), is also the possibility of losing the outstanding loan partially or totally, due to credit events (default risk). It can also be defined as agreed terms. Credit risk is also variously referred to as default risk, performance risk or counterparty risk (Brown and Moles, 2012).

A bank exists not only to accept deposits but also to grant credit facilities, therefore inevitably exposed to credit risk (Elena Carletti, 2006). Credit risk is by far the most significant risk faced by Banks and the success of their business depends on accurate measurement and efficient management of this risk to a greater extent than any other risks (Gieseche, 2004). (Coyle, 2000) defines credit risk as losses from the refusal or inability of credit customers to pay what is owed in full and on time. Credit risk is the exposure faced by Banks when a borrower (customer) defaults in honoring debt obligations on due date or at maturity. This risk interchangeably called 'counterparty risk' is capable of putting the Bank in distress if not adequately managed. Credit risk management maximizes Bank's risk adjusted rate of return by maintaining credit risk exposure within acceptable limit in order to provide framework for understanding the impact of credit risk management on Banks' profitability (Kargi, 2011).

The main source of credit risk includes, limited institutional capacity, inappropriate credit policies, volatile interest rates, poor management, inappropriate laws, low capital and liquidity levels, direct lending, massive licensing of Banks, poor loan underwriting, laxity in credit assessment, poor lending practices, government interference and inadequate supervision bythe central Bank (Kithinji, 2010).Credit risk is critical since the default of a small number ofimportant customerscan cause large losses, which can lead to insolvency (Bessis, 2002).

As per NBE (2010) risk management guide line credit risk is the risk of financial loss, despite realization of collateral security or property, resulting from the failure of a debtor to honor its obligations to the bank. The area of credit risk includes default risks related to a bank's portfolio of bonds (credit through investment) and other fixed income investments, counter party risk on derivative contracts and the risk of default on loans or insured debts and trade debtors. The major risk that arises from a weakening of the credit portfolio is the impairment of capital or liquidity. For most banks, extending credit through investment and lending activities banks an important portion of their business. Therefore, the quality of an institution's credit portfolio contributes to the risks borne by policyholders (liquidity) and shareholders (capital impairment).

1.8.2.1. Credit Risk Management

Accordingly, NBE (2010) referred that managing credit risk is a fundamental component in the safe and sound management of companies. Sound credit risk management involves establishing a credit:

- Identifying existing or potential credit risks to which the company is exposed, on or off-balance sheet, in conducting its investment and lending activities and developing and implementing sound and prudent credit policies to effectively manage and control these risks;
- Developing and implementing effective credit granting, documentation and collection procedures;
- Developing and implementing procedures to effectively monitor and control the nature, characteristics, and quality of the credit portfolio; and developing processes for managing problem accounts.

1.8.2.2. Liquidity risk

Liargovas et al. (2008) explained liquidity risk as degree to which debt obligations coming due in the next 12 months can be paid from cash or assets that will be turned into cash. It is usually measured by the current assets to current liabilities (current ratio). It shows the ability to convert an asset to cash quickly and reflects the ability of the firm to manage working capital when kept

at normal levels. A firm can use liquid assets to finance its activities and investments when external finance is not available or it is too costly. On the other hand, higher liquidity would allow a firm to deal with unexpected contingencies and to cope with its obligations during periods of low earnings.

As indicated by Gerald et al. (2001) liquidity risk is the risk of not being able to meet payment liabilities when due. The liquidity of an investment is defined by how quickly and to what extent it can be converted into cash. The ability to convert the investment into cash is, however, dependent on several factors which influence the scope of the liquidity risk.

In addition to general market conditions which necessitate the dissolution of an investment under unfavorable conditions, an unexpected demand for liquidity may be triggered by a credit rating downgrade, negative publicity (whether justified or not) or reports of problems of other companies in the same or similar lines of business (Gerald et al., 2001).

Maintaining high liquidity can reduce management's discipline as regards both underwriting and investment operations. Moreover, according to the theory of agency costs, high liquidity of assets could increase agency costs for owners because managers might take advantage of the benefits of liquid assets. In addition, liquid assets imply high reinvestment risk since the proceeds from liquid assets would have to be reinvested after a relatively short period of time. Undoubtedly, reinvestment risk would put a strain on the performance of a company. In this case, it is, therefore, likely that commercial banks with less liquid assets outperform those with more liquid assets. Nevertheless, agency costs and reinvestment risk can be effectively minimized if proper actions are taken (Adams et al., 2000). Anthony et al. (1997) described liquidity risk as the risk of a funding crisis.

As mentioned by NBE (2010) risk management guide line operating liquidity or cash management covers the day-to-day cash requirements under normally expected or likely business conditions. Strategic liquidity considers liquidity needs on a longer-term basis and recognizes the possibility of various unexpected and potentially adverse business conditions.

Strategic liquidity is a key consideration of asset/liability management because of its potential effect on the ultimate viability of the company. Liquidity is the availability of funds, or assurance that funds will be available, to honor all cash outflow commitments (both on and off-balance sheet) as they fall due. These commitments are generally met through cash inflows, supplemented by assets readily convertible to cash or through the company's capacity to borrow.

The risk of illiquidity increases if principal and interest cash flows related to assets, liabilities and off-balance sheet items are mismatched (NBE, 2010).

1.8.2.3. Liquidity risk management

The following points are liquidity risk management practices that are sated by NBE (2010) risk management guideline;

- Managing liquidity is a fundamental component in the safe and sound management of companies.
- Sound liquidity management involves prudently managing assets and liabilities (on and off- balance sheet) to ensure that cash inflows have an appropriate relationship to the size of approaching cash outflows.
- Liquidity planning assesses potential future liquidity needs, taking into account various possible changes in economic, market, political, regulatory, and other external or internal conditions.
- Planning for liquidity needs involves identifying known, expected and potential cash outflows and weighing alternative business management strategies to ensure that adequate cash inflows will be available to the company to meet these needs

1.8.2.4. Market Risk

Market risk is the exposure of a company to the effect of price changes on the market value of those elements of the company's portfolio of investments, both on- and off-balance sheet, Price changes may occur because of a number of factors, such as those solely related to specific investment or to the portfolio of investments in general. In addition, the effect of the price change is a function of the size of the investments position, and the degree of price movement between the purchase date and the date of subsequent re-evaluation or sale, as the case may be (NBE, 2010).

Investments Portfolio Management Program

As explained by NBE (2010), managing the investment portfolio is a fundamental component in the safe and sound management of a company, Sound investment portfolio management involves prudently managing the risk/reward relationship and controlling investment portfolio risks across a variety of dimensions, such as quality, portfolio concentration/diversification, maturity, volatility, marketability, type of and the need to maintain adequate liquidity, Although the particulars of investment portfolio management will differ among companies depending upon the nature and complexity of their investments activities, a comprehensive investment portfolio management program requires:

- Establishing and implementing sound and prudent policies to effectively manage the investments portfolio, investments activities and position risk;
- Developing and implementing effective investments portfolio management processes governing investments investment decision-making and authority; and
- Developing and implementing comprehensive procedures to effectively monitor and control the nature, characteristics, and quality of the investment portfolio and the extent of position risk assumed.

1.8.2.5. 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.

The direct foreign exchange risk can be either Transactional or it can be Translational. Transactional risk, as the name implies is because of transactions in foreign currencies and translational risks is an accounting risk arising because of the translation of the assets held in foreign currency. The indirect exchange rate risk is basicallyemanated from economic exposure which reflected through demand for bank loan and the bank loan performance.

According to Sabri (2011)foreign exchange risk of a commercial bank comes from its very trade and non-trade services. Foreign Exchange Trading Activities (Saunders & Cornett, 2003 cited in Sabri(2011)include:

- The purchase and sale of foreign currencies to allow customers to partakein and complete international commercial trade transactions.
- The purchase and sale of foreign currencies to allow customers (or thefinancial institution itself) to take positions in foreign real and financial investments.
- The Purchase and sale of foreign currencies for hedging purposes to offsetcustomer (or financial institution itself) exposure in any given currency.
- To purchase and sale of foreign currencies for speculative purposes based on forecasting or expecting future movements in Foreign Exchange rates.

The commercial bank is exposed to foreign exchange risk only up to the extent to which it has not hedged or covered its position. In some of the above-mentioned trade activities (the first two activities), commercial banks play a role on behalf of customer and the foreign exchange risk is transferred to the customer as the bank takes agency role. Third activity of bank involves hedging and there is no risk in this as well as the bank has hedged its risk by pre-determining the

exchange rate with other financial institutions using different financial instruments. The fourth one involves the risk which may result in the gain or loss due to unexpected outcome.

3. Causes of exchange rate volatility

There is a variety of factors contributing to the fluctuation of an exchange rate. These include the openness of an economy, the domestic and foreign money supplies, the exchange rate regime, interest rates, central bank independence, and levels of output, income, inflation, and unpredictable circumstances. The degree of the impact of each of these factors varies and depends on a particular country's economic condition (Stancik, 2006). The study further explained how these factors contribute to exchange rate fluctuation as summarized below.

Inflation -Changes in market inflation cause changes in currency exchange rates. A country with a consistently lower inflation rate exhibits a rising currency value while a country with higher inflation typically sees depreciation in its currency and is usually accompanied by higher interest rates. Interest rate-Changes in interest rate affect currency value and exchange rate. Increases in interest rates cause a country's currency to appreciate because higher interest rates provide higher rates to lenders, thereby attracting more foreign capital, which causes a rise in exchange rates.

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 Adjustedinterest rate(Jeffrey, 2008).

II. 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 owing to information asymmetries, depreciation inexchange rate might cause lending to decline in twodifferent ways. First, if such depreciation worsens borrowers' balance sheets, then the default risk will be been large and banks would shy away from making loans. On the other hand, if banks are exposed to short termliabilities in foreign currencies, then such liabilities will be amplified to the tune of the extent of depreciation of thelocal currency and any other associated costs, thus, dampening their potential to create credit.

Also, using a bank's loan to an exporter as an example, Chamberlain et al. (1997) demonstrate that banks that perfectly hedge their accounting exposure could still be exposed to significant foreign exchange risk if exchange rate movements significantly affect cash flows, competitiveness, and credit risk of banks' customers (i.e. indirect or economic exposures). This indicates that the sources of foreign exchange risk of banks are far more than just their holdings of net foreign assets.

Wong et al (2008) indicated that the direct effect of individual banks exchange rate exposure can be discerned largely from their accounting data, while the indirect exposure, which arises from impacts of exchange rate fluctuations on the economy in general and banks' customers in particular, is more subtle.

Foreign exchange risk also may be linked to other types of market risk, such as interest rate risk. Interest rates and exchange rates often move simultaneously. So, a bank's interest rate position indirectly affects its overall foreign exchange exposure. The foreign exchange rate sensitivity of a bank with an open interest rate position typically will differ from that of a bank with no interest rate exposure, even if the two banks have the same actual holdings of assets denominated in foreign currencies. Therefore, the vulnerability of the bank as a whole to foreign exchange fluctuations depends on more than just its holdings of foreign exchange (Popper 1996).

Generally, Foreign exchange rate movements could be an important source of risk for banking institutions. In the worst case, large foreign exchange losses may lead to bank failures. In the literature, a large number of empirical works have been carried out to examine the foreign exchange exposure of banks. However, most of these studies mainly focused on banking markets which are well developed market, by comparison, studies focusing on less developed banking markets are relatively scant.

III. Commercial banks Foreign Exchange Risk Management

Banks can manage their foreign currency risk in different ways. One of the techniques by which foreign exchange risk can be mitigated is hedging. It is way by using which a bank eliminates or minimizes its risk exposure. Hedging can be done using different ways:

- Foreign Currency Assets & Liabilities Matches: It is a hedging technique by which commercial banks matches its assets and liabilities in foreign currencies to ensure a profitable spread by dealing in foreign currency.
- Hedging using Derivatives: A commercial bank uses foreign currency derivatives to hedge foreign exchange risk. There are different kinds of foreign currency derivatives, these are:

a. Foreign Currency Futures

b. Foreign Currency Swap

c. Foreign Currency Options

d. Foreign Currency Forward 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).

1.8.2.6. Solvency risk

As defined by AARDLB (2010) solvency is defined as having enough value in the form of assets in your business to cover all of the liabilities of the business. Based on the accounting equation that assets = liabilities + equity, this definition means that a business has positive equity. When a businesses' equity becomes negative it is said to be insolvent. Bankruptcy is just around the corner for an insolvent business if it does not generate enough cash flow income to meet its debt requirements in a timely manner.

Solvency is the ability of a company to meet its long-term fixed expenses and to accomplish long term expansion and growth. A solvency ratio of greater than twenty percent is considered financially healthy.

1.8.2.7. 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) indicated that when interest rates rise or fall, it exerts an impact on banks' profits through adjustment to revenues. Empirical evidence from Molyneux and Thornton (1992)indicate that high interest rate is significantly associated with higherbank profitability, i.e. a significant positive relationship. Contrarywise,Naceur (2003) highlights a negative relationship

between interest rates and bank profitability. This contradiction is a reasonable justification for further empirical analyses.

Alper and Anbar (2011) investigated bank specific and macroeconomic determinants of commercial bank profitability in Turkey over the period of 2002-2010. The study uses both return on asset (ROA) and return on equity (ROE) as proxy for bank profitability. By employing balanced set of panel data and fixed effect model, the result shows that only real interest rate is positively related with profitability in regards to macroeconomic variables. In other words, an increase in real interest rate which is influenced by increase in inflation rates would lead to an increase in commercial banks' profitability in Turkey. Bergen (2010) studied that countries with higher inflation observes that there is depreciation in their currency in relation to the currencies of their trading partners. This is also usually accompanied by higher interest rates resulting into a positive relationship between inflation and performance of banks.

1.8.2.8. Inflation rate risk

The inflation rate means the rate of changes in the price of any commodity. Economic theory can predict either positive, negative or zero effect of the trend of inflation on performance depending on the specific assumptions of the model. Given the absence of a theoretical consensus, the anticipated relationship between inflation and bank performance remains an empirical issue largely (Umar, Maijama and Adamu 2014). The effect of inflation on commercial bank profitability is an issue on which conclusion cannot be drawn hastily. Empirical investigations into the relationship between the variables have been inconclusive as the findings have been mixed. While some investigations observe positive relationship between the variables, others observe negative relationship, and yet others observe no significant relationship (Scottl&Ovuefeyen, 2014). Similarly, the previous studies have also arrived at divergent results on the relationship between inflation rate and banks profitability.Inflation has an inverse relationship to profitability because an increase in inflation means lowering the profitability of banks due to higher prices (Saeed 2014), and also performed the regression and correlation analyses on 73 UK commercial banks and found that GDP and inflation rate have negative impact on the profitability of banks in the United Kingdom. Ongoreand Kusa (2013) and Athanasoglou et al (2005) stated that the relationship between inflation level and bank profitability is remained to be debatable. The relationship between the inflation and the bank profitability depends on whether the inflation is anticipated or unanticipated.

The extent to which inflation affects bank profitability depends on whether future movements in inflation are fully anticipated, which, in turn, depends on the ability of firms to accurately forecast future movements in the relevant control variables. An inflation rate that is fully anticipated raises profits as banks can appropriately adjust interest rates in order to increase revenues, while an unexpected change could raise costs due to imperfect interest rate adjustment (Flamini et al, 2009). A widely used proxy for the effect of the macroeconomic environment on bank profitability is inflation (Athanasoglou, Delis, &Staikouras, 2008). Revell (1979); cited in Athanasoglou, Delis, &Staikouras, (2008), introduces the issue, noting that the effect of inflation depends on whether banks' wages and other operating expenses increase at a faster rate than inflation. The question is how mature an economy is so that future inflation can be accurately forecast and thus banks can accordingly manage their operating costs. As such, the relationship between the inflation rate and profitability is ambiguous and depends on whether or not inflation is anticipated.

There are studies that found a positive and significant effect of inflation on commercial banks profitability, such as the findingbyLelissa, 2014; Athanasoglou et al., 2008; Guru et al., 2002; Demirgüç-Kunt&Huizinga, 2001; Flamini et al., 2009; Garcia-Herrero et al., 2009; Gul et al., 2011; Sufian, 2011; Trujillo Ponce, 2013; Vong& Chan, 2006; Frederick, 2015, among others.

1.8.3. Risk Management Theory

Risk management is the identification, assessment, and prioritization of risks followed by coordinated and economical application of resources to minimize, monitor, and control the probability and/or impact of unfortunate events or to maximize the realization of opportunities. Effective risk management can bring far reaching benefits to all organizations, whether large or small, public or private sector. These benefits include, superior financial performance, better basis for strategy setting, improved service delivery, greater competitive advantage, less time spent firefighting and fewer unwelcome surprises, increased likelihood of change initiative being achieved, closer internal focus on doing the right things properly, more efficient use of resources, reduced waste and fraud, and better value for money, improved innovation and better management of contingent and maintenance activities (Wenk, 2005).

1.8.3.1. The Financial Economic Theory

Financial economics approach to corporate risk management builds on the Modigliani Miller paradigm and has so far been the most prolific in terms of both theoretical model extensions and

empirical research (Klimczak, 2007). This theory stipulates that hedging leads to lower volatility of cash flow and therefore lower volatility of firm value. The theory argues that the ultimate result of hedging, if it indeed is beneficial to the firm, should be higher value – a hedging premium. Jin and Jorion (2006) criticize this theory by posting that —although risk management does lead to lower variability of corporate value which is the main prerequisite for all other effects, there seems to be little proof of this being linked with benefits specified by the theory.

1.8.3.2. New Institutional Economists Theory

The new institutional economist's shift their focus is to governance processes and socioeconomic institutions that guide these processesWilliamson (1998). Klimczak (2007) notes that there are no empirical studies of new institutional economics approach to risk management that have been carried out so far but the theory offers an alternative explanation of corporate behavior Klimczak (2007) points out that the theory predicts that risk management practices may be determined by institutions or accepted practice within a market or industry. According to Williamson (1987) adds that the theory links security with specific assets purchase which implies that risk management can be important in contracts which bind two sides without allowing diversification, such as large financing contract or close cooperation within a supply chain.

1.8.3.3. Agency Theory

The agency theory explains a possible mismatch of interest between shareholders, management and debt holders due to asymmetries in earning distribution, which can result in the firm taking too much risk or not engaging in positive net value projects (Mayers and Smith, 1987). The Agency theory was first postulated by Jensen and Meckling in the 1976 article —Theory of the Firm: Managerial Behavior, Agency Costsand Ownership Structure and it helped establish agency theory as the dominant theoretical framework of the corporate governance literature and position shareholders as the main stakeholder (Lan and Heracleous, 2010). Smith and Stulz (1985) posit that agency issues have been shown to influence managerial attitudes toward risk taking and hedging in the field of corporate risk management.Consequently, agency theory implies that defined hedging policies can have important influence on firm value (Fite and Pfleiderer, 1995).

1.8.3.4. Stakeholder Theory

The stakeholder theory was initially developed by Freeman in 1898 as a managerial instrument and has since evolved into a theory of the firm with high explanatory potential (Klimczak, 2007).

According to Klimczak (2007) the stakeholder theory focuses explicitly on equilibrium of stakeholder interests as the main determinant of corporate policy and that it‘s most promising contribution to risk management is the extension of implicit contracts theory from employment to other contracts. Omasete (2014) posits that the stakeholder theory helps to address the importance of customer trust and financial distress costs to companies. Finally, the theory suggests that smaller firms are more prone to financial problems, which should increase their interest in risk management practices (Omasete, 2014).

1.8.3.5. Portfolio Theory

Since the 1980s, banks have successfully applied modern portfolio theory (MPT) to market risk. Many banks are now using earnings at risk (EAR) and value at risk (VAR) models to manage their interest rate and market risk exposures. Unfortunately, however, even though credit risk remains the largest risk facing most banks, the practice of MPT to credit risk has lagged (Margrabe, 2007). Under the portfolio theory, traditionally banks have taken an asset-by-asset approach to credit risk management. While each bank ‘s method varies, in general this approach involves periodically evaluating the credit quality of loans and other credit exposures, applying a credit risk rating, and aggregating the results of this analysis to identify a portfolio ‘s expected losses (Gakure, Ngugi, Ndwiga and Waithaka, 2012). According to Gakure et al (2012) the foundation of the asset-byasset approach is a sound loan review and internal credit risk rating system. In this approach a loan review and credit risk rating system enable management to identifychanges in individual credits, or portfolio trends in a timely manner (Gakure et al, 2012). Based on the results of its problem loan identification, loan review, and credit risk rating system management can make necessary modifications to portfolio strategies or increase the supervision of credits in a timely manner. While the asset-by-asset approach is a critical component to managing credit risk, it does not provide a complete view of portfolio credit risk, where the term risk refers to the possibility that actual losses exceed expected losses. Therefore, to gain greater insight into credit risk, banks increasingly look to complement the asset-by-asset approach with a quantitative portfolio review using a credit model. Banks increasingly attempt to address the inability of the asset-by-asset approach to measure unexpected losses sufficiently by pursuing a portfolio approach. According to Essendi (2013) the portfolio has a basic assumption that investors often want to maximize returns from their investments for a given level of risk and provides a framework for specifying and measuring investment risk and to develop relationships

between risk and expected returns. One weakness with the asset-by-asset approach is that it has difficulty identifying and measuring concentration. Concentration risk refers to additional portfolio risk resulting from increased exposure to a borrower, or to a group of correlated borrowers.

The traditional portfolio approach uses two methods, namely the expert method and the credit scoring models in the expert system, the credit decision is left in the hands of the branch lending officer. His expertise, judgment, and weighting of certain factors are the most important determinants in the decision to grant loans. The traditional approach to the assessment of credit proposition of borrowers is based on the heuristics or intuition of the loan officer. Heuristic decision-making is, however, not necessarily arbitrary or irrational because it is based on years of experience that enable individuals to identify solutionquickly without going through an analytical process (Rosli, 2000). The 5Cs of credit are always used by banks to assess the creditworthiness of the potential borrower. The 5Cs of credit refer to Character, Capacity, Conditions, Collateral and Capital (Dev, 2009).

Character assessment is performed to determine the willingness and desire of borrowers to repay debt. Capacity is described as the borrower‘s capacity to borrower and also his repayment capacity. Economic conditions will also affect the borrower‘s ability to repay the loan. A bank will normally ask for collateral as security against the loan. Capital requirement of the business indicates the financial net worth of the borrower. The loan officer can examine as many points as possible but must include these five Cs in addition to interest rate.

In order to estimate default probability credit scoring models, use statistical and mathematical methods (Togtokh, 2012).Some writers note that the reason for this increased use of the scoring methods is that the methods are relatively cheap, bases on historical data and simple compared to modern approaches. For example, Mester (cited in Togtokh, 2012)revealed widespread useof credit scoring models showing that 97 percent of the banks use credit scoring to approve credit card application, whereas 70 percent of the banks use credit scoring in their small business lendi

1.9.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 financial performance of commercial banks Eneyew (2013) made a research on 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 employed secondary sources data which was gathered from NBE about audited financial statements of the banks. He selected credit risk, liquidity risk, interest rate risk and foreign exchange rate risk as independent variables and Size, Bank Capitalization, GDP Growth Rate and Inflation growth rate as controllable variables. In addition to this, he applied return on asset (ROA) for measurement of profitability which was taken as dependent variable. He used a panel data to make a quantitative analysis and also tested the basic model of assumptions. The study found that credit risk was the major factor that affects the profitability of Ethiopian commercial banks negatively. Next to this, liquidity risk was also the major factor that adversely affects profitability of Ethiopian commercial banks. Profitability of the bank would be adversely affected by Interest rate risk. However, this negative relationship was not found statistically significant even at 10 % significance level (p-value =0.8964). There is insignificant negative relationship between foreign exchange rate risk and profitability. In line with this, bank capitalization was the major factor that can determine the variation of profitability in Ethiopian commercial banks. Ethiopian banks profitability increases as the sizeof the banks increase, which strengths the fact that larger banks are enjoying higher profit than smaller banks of the country. GDP growth revealed a positive and statistically significant association with the profitability of Ethiopian commercial banks. There is inverse relationship among inflation and profitability of Ethiopian commercial banks. However, this negative association was not statistically significant; thus, the findings suggested that inflation was not a major factor that determine the profitability of Ethiopian banks.

Other similar study on Greek banks was conducted by Alexiou and Sofoklis (2009) to examine the effects of bank-specific and macroeconomic determinants of Greek bank profitability, by assuming that the two broad sets of variables (ROA and ROE) that control bank profitability are a function of the specific sector as a whole as well as the macroeconomic environment

Within which the sector operates. A panel data approach was applied to six Greek banks using an empirical framework that incorporates the traditional Structure-Conduct- Performance (SCP) hypothesis. The finding suggests that most of the bank-specific determinants were significantly affect bank profitability. However, there is relatively weak relationship between size and profitability, and ambiguous picture were considered on macroeconomic factors.

Sufian and Chong (2008), look for the factors that influence the profitability of Philippines banking sector by using ROA as a dependent variable during the period 1990–2005. The empirical evidences suggest that all the bank specific determinant variables have a statistically significantly impact on bank profitability. Among them size, credit risk, and overhead expensed are negatively affect the bank profitability, whereas non-interest income and capitalization have a positive impact on it. Concerning the macroeconomic factors, the findings show that except inflation which has a negative impact on bank profitability, GDP, the growth in money supply, and the level of stock market capitalization have not significantly explained the profitability of Philippines banks.

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.

Ayandaet. 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 Ameur 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, size 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.

Alkhatib, (2012), with the purpose to empirically examine the financial performance of five Palestinian commercial banks listed on Palestine securities exchange. In this paper, Financial

performance has been measured by using three indicators; Internal–based performance measured by Return on Assets, Market-based performance measured by Tobin's Q model (Price / Book value of Equity) and Economic–based performance measured by Economic Value add. The study employed the correlation and multiple regression analysis of annual time series data from 2005-2010 to capture the impact of bank size, credit risk, operational efficiency and asset management on financial performance measured by the three indicators, and to create a good-fit regression model to predict the future financial performance of these banks. The finding implies that operational efficiency and asset management individually have significant impact on ROA, when they used along with bank size and credit risk, they add significant effect on Tobin's Q and EVA.

San1 and Heng (2013), conducted the study aims to investigate the impact of bank-specific factors which include the liquidity, credit, capital, operating expenses and the size of commercial banks on their performance, which is measured by return on average assets (ROAA) and return on average equity (ROAE). The results imply that ratios employed in this study have different effects on the performance of banks in both China and Malaysia, except credit and capital ratios. Operating ratios influence performance of banks in China, but this influence is not true for Malaysian banks regardless of the measure of performance.

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 usedfor 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.

1.10. 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) confirm 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 findingbyLelissa, 2014; Athanasoglou et al., 2005, 2008; Guru et al., 2002; Demirgüç-Kunt& Huizinga, 1999, 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 2000 to 2017.

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 2000 to 2017.

1.11. Conceptual Frame Work

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.

Figure 2.1 the conceptual framework or model of the study

Credit Risk

Liquidity Risk

Inflation Rate Risk

Interest RateRisk

Exchange Rate Risk

Solvency Risk

CHAPTER THREE

4. RESEARCH DESIGN AND METHODOLOGY

This chapter deals with research methodology that used to carry out this study. The chapter is organizing in nine sub sections. In its first part there is a research design, then after it presents subsequently about research approach, population, sample and sampling technique, data type, sources and instruments, data analysis and model specification. The final part presents about the description and operationalization of the study variables.

1.12. Research Design

Cooper et al. (2003) discussed that explanatory studies unlike descriptive studies, go beyond observing and describing the condition and tries to explain the reasons of the phenomenon. Thus, explanatory research design was used in this research because the study identifies the cause and effect of financial risk and commercial banks' performance which is appropriate to achieve the objective of the study.

1.13. Research approach

When conducting a research, there are different ways of approaching the problem. According to Creswell (2009), there are three approaches of research; quantitative, qualitative and mixed. The following discussions briefly presents the basic features of these research approaches. Quantitative research is a means for testing objective theories by examining the relationship among variables (Creswell, 2009). On the other hand, qualitative research approach is a means for exploring and understanding the meaning individuals or groups ascribe to a social or human problem with intent of developing a theory or pattern inductively (Creswell, 2009). Finally, mixed methods approach is an approach in which the researchers emphasize the research problem and use all approaches available to understand the problem (Creswell, 2003).

Hence, based on the above discussions of the three research approaches and by considering the research problem and objective, the study was used quantitative research approach. Therefore, to have a better insight and gain a richer understanding about the effect of financial risk on commercial banks' performance, the quantitative research method was employed.

1.14. Population of the Study

According to Kothari (2006), the population of a study is simply the entire set of individuals or items that are described in the study as being the area of study and which the researcher is trying

to observe their characteristics or behavior. The population constitutes of all the items that fit the study area and it should be noted that this is the area the researcher selects an appropriate sample to subject to the study. The target population for the study will be all commercial banks registered by NBE. Currently, there are seventeen commercial banks in Ethiopian that are one government owned and sixteen privately owned commercial banks.

Table 3.1 Lists of public and private Commercial Banks 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,2017

1.15. Sample and Sampling Techniques

The total populations of commercial banks are seventeen but for the study purpose the researcher used sample of seven sample commercial banks out of seventeen commercial banks that operated in Ethiopia.

Therefore, the study covered a period of eighteen (18 years from 2000-2017 and the sample include Commercial Bank of Ethiopia, Awash International Bank S.C, Dashen Bank S.C, Bank of Abyssinia S.C, Wegagen Bank S.C, United Bank S. and Nib International Bank S.C.Hence, the researcher employed purposive sampling method to draw the sample from the population and meet the predefined objective of the study. The matrix for the frame is 7*18 that includes 126 observations.

1.16. Data sources and instruments

In order to carry out any research activity; information should be gathered from proper sources. According to (Yuqi, 2006), secondary data have its own advantages. Compared to primary data, secondary data gives higher quality data, the feasibility to conduct longitudinal studies and the permanence of data which means secondary data generally provide a source of data that is both permanent and available in a form that may be checked relatively easily by others. Therefore, to increases the dependability of the data, the study used secondary data which is based on the audited financial statement of the banks which are readily available on their website and archives as well as the macroeconomic data was collected from MoFEC, and other published and unpublished documents.

1.17. Data analysis technique

To achieve the predefined objective of the study, the study mainlyconcentratedon quantitative analysis and supported by qualitative analysis. Hence, the researcherused econometric model to identify and measure the effect of financial risk on performance of Ethiopian commercial banks and used Linear Multiple Regression Model. For the effective analysis of the data, Stata-13 econometric software was used in the study.

According to Brooks (2008) regression is concerned with describing and evaluating the relationship between a given variable (usually called the dependent variable) and one or more other variables (usually known as the independent variables. Thus, for determining the relationship, the study used return on assets (ROA) as proxy for the bank's financial performance as a dependent variable and independent variables comprising of liquidity risk, solvency risk, credit risk,interest rate risk, inflation rate risk and foreign exchange rate risk. Besides to this, the researcher adopted panel data regression model particularly random effect panel data regression model to examine the effect of financial risk on commercial banks' performance.

As stated by Brooks (2008) panel data is favored for situation often arises in financial modeling 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 (2010-2017). Therefore, the collected panel data is analyzed by using descriptive statistics, correlations and multiple linear regression analysis.

1.18. Model specification

According to Brooks (2008), it is very easy to generalize the simple model to one with k regressors (independent variables). $Yi = \beta1 + \beta2x1i + \beta3x2i + \cdots + \beta kxki + \varepsilon i$, $i = (1, 2, \ldots, i)$. So, Where Yi is the ith observation of the dependent variable, X1i…, Xki are the ith observation of the independent variables, β0…, βk are the regression coefficients, εi is the ith observation of the stochastic error term.

Accordingly, to test the effect of financial risk on Commercial banks' performance, the researchers as estimated a linear regression model in the following form.

$ROAbt = \beta0 + \beta1LRbt + \beta2CRbt + \beta3SRbt + \beta4IRRbt + \beta5Inf.\ RRbt + \beta6ERR + \varepsilon$

Where:

ROA= Return on asset;

CR= Credit risk

LR= Liquidity risk

SR= Solvency risk

IRR= Interest Rate Risk

Inf. RR=Inflation Rate Risk

ERR = Foreign Exchange Rate Risk

Є =is the error component for bank bat time t assumed to have mean zero E [Є it] = 0 β0= Constant β= 1, 2, 3…6 are parameters to be estimate; b = commercial bank b= 1. . . 7; and t = the index of time periods and t = 1. . . 18.

1.19. Variables description

According to Creswell (2009), to make it is clear to readers what groups are receiving the experimental treatment and what outcomes are being measured, the variables need to be specified in quantitative researches. Thus, this section explained the variables that will use as dependent and independent (explanatory) variables in the study. The definitions and

measurementsof the variables are described as follows. In addition to this, hypothesis is also developed derived from previous empirical evidences.

Dependent variable

Return on Asset (ROA)

The study employs return on assets to measure financial performance of Ethiopian commercial banks. According to Daniel et al. (2013) mentioned that return on total assets (ROA) is calculated as net profit before tax by total assets. This is probably the most important single ratio in comparing the efficiency and financial performance of commercial banks as it indicates the returns generated from the assets that banksown. In addition, as stated by Ana-Maria et al. (2014), the return on total assets ratio represents one of the most used methods of quantifying financial performance. It was developed in 1919 by Dupont and it emphasizes the company's ability to efficiently use its assets. As indicated by Mirie (2015), financial performance is a measure of an organization's earnings, profits, appreciations in value as evidenced by the rise in the entity's share price. As explained by Amal (2012) return on assets determines an organization's ability to make use of its assets and return on equity reveals what return investors take for their investments. The advantages of financial measures are the easiness of calculation and that definitions are agreed worldwide. Accordingly, in most previous studies on insurance sector, return on asset (ROA) is being used as a proxy of performance (Arif et al., 2015; Adrian, 2014; Yuvaraj et al., 2013 and Mirie, 2015). Thus, the study has taken return on asset (ROA) as dependent variable to measure performance of Ethiopian commercial banks.

Independent Variables

This subsection described the independent variables that will use in the econometric model to estimate the dependent variable. To measure the effect of financial risk variables on commercial banks' performance in Ethiopia, seven measures are used as independent variables which are extracted from different studies. The variables namely; credit risk, liquidity risk, inflation rate risk, interest rate risk, capital risk, solvency riskandexchange rate risk.

5. Liquidity Risk

Liquidity risk is the probability a bank will not have sufficient cash and borrowing capacity to meet deposit withdrawals, loan demand and other cash needs. It is also the inability to manage changes in funding resources. Basically, liquidity risk also come from the failure to recognize changes in market conditions that affect the ability to liquidate assets quickly with the minimum losses. Thus, liquidity risk can say to be a crucial measure for bank's profitability. The current

ratio is chosen to represent the liquidity risk of the banks in this paper. Current ratio is the most popular measure of liquidity risk. It is the ratio which indicates the efficiency of a bank operating cycle to turn its assets into cash. The higher the ratio, the more capable the bank is of paying its obligations.

$$\text{Liquidity risk} = \frac{\text{Current Assets}}{\text{Current liabilities}}$$

6. Credit risk

Credit risk is the risk that borrower unable to make payment on loan. Credit risk is calculated based on the borrowers' overall capability to repay. There are many ways to calculate credit risk such as nonperforming loan, and risk weighted assets. However, loan loss provision to total loans is used to assess credit risk in this research. It is the allowance that set aside for bad loans. Bank need to increase the amount for loan loss provision when it is exposed to high risk loan. This is due to there is high growth of unpaid loans. Higher loan loss provision ratio will reduce the net income and earnings per share. The lower the ratio, the better it is for banks.

$$\text{Credit risk} = \frac{\text{Loss loan provision}}{\text{Total loans}}$$

7. Inflation Rate Risk

Inflation rate risk is defined as the percentage change in the prices of goods and services (as indicated by a price index) and is usually calculated in annual basis. Besides that, inflation rate can also determine how fast a currency can appreciates or depreciates its value. It is important to industries that offer fixed income securities such as fixed deposit offer by a bank because the returns on these securities may be vary along the changes of inflation rate. The data of inflation rate is obtained from the DataStream.

8. Interest Rate Risk

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

9. 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 equityto absorb losses or the potential inability to meet thematuring obligations. Capital to assets ratio represents thebank's cushion against unanticipated losses and thus protects the interests of uninsured depositors.

10. Foreign Exchange Rate 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. No one can predict what the exchange rate will be in the next period, it can move in either upward or downward direction regardless of what the estimates and predictions were. This uncertain movement poses a threat to the earnings and capital of bank, if such a movement is in undesired and unanticipated direction Evans. O (2014). SongulKakilli (2013) Turkish banking sector's profitability factors found positive relationship between exchange rate and profitability. Thus, this variable has significant and positive impact on profitability. Official exchange rate refers to the exchange rate determined by national authorities or to the rate determined in the legally sanctioned exchange market. It is calculated as an annual average based on monthly averages (local currency units relative to the U.S. dollar).

1.20. Operationalization of the study variables

The following table presents the summary of variables, their measurement and expected sign for the influence of the independent variables on the Ethiopian commercial banks' performance.

Table 3.3: Description of the variables and their expected relationship

	Variables	Measure	Notation	Expected sign
Dependent Variable	Return on Asset	NIBT/TA	ROA	
Independent Variables	Liquidity risk	Current Assets / Current liabilities	LR	__
	Solvency risk	Capital/Total Assets	SR	+
	Credit risk	LLP/Total loans	CR	__

	Interest Rate Risk	Real cost of borrowing	IRR	+
	Inflation Rate Risk	Annual general inflation rate	Inf. RR	__
	Exchange Rate Risk	ETB to US dollar	ERR	+

Chapter Four

11. Data Analysis and Presentation

This chapter deals with the analysis and presentation of the results of the study. The data were analyzed by using Stata version13 software. The descriptive statistics and the correlation analysis were discoursed. Followed by the diagnostic test, which is necessary to fulfill the assumption of the classical linear regression model.Then, econometric analysis anddiscussion of the main finding of the study were presented. Finally, the results of the regression analysis were discussed by supporting empirical evidence.

1.21. Descriptive statistics

This section presents the descriptive statistics of dependent and independent variables that were used in the study for the sample banks. The dependent variables used in the study were ROA despite the fact that the independent variables were credit risk, solvency risk, liquidity risk, interest rate risk, inflation risk and exchange rate risk. Thus, the totalobservation for each dependent and explanatoryvariable were 126 (panel data of 7 commercial banks for 18 years). The table 4.1 demonstrates the mean, standard deviation, minimum and maximum values for the dependent and independent variables for sample banks over the year 2000 to 2017.

The ROA measured by the NIBT divided by TA has a mean value of 3.3160 percent. This indicates that the sample banks on average earned a NIBT of 3.3160 percent of the total asset. Since ROA indicates the efficiency of the management of a company in generating NIBT from all the resources of the institutions, the higher ROA shows that the company is more efficient in using its resources. The maximum value of ROA was 5.68percentbut the minimum value of ROA was of 0.51percent. That means the most profitable and least profitable banks among the sampledEthiopian commercial bankswere earned 5.68 cents and 0.51 cents of net income for a single birr invested in the assets of the firm respectively.

Concerning the independent variables, liquidity risk that is measured by current assets divided by current liabilities has a mean value of 44.02percent. The average value indicates that for each one-birr current liability, there was44 cent current asset to meet obligation. A minimum and maximum value of 14.83 and 95.77 percent respectively. Besides to this, the standard deviation

of the liquidity risk was 14.9689 percent. The 2nd independent variable used in the study wassolvencyrisk which is measured by total equity divided by total assets has a mean value of 11.95 percent with a maximum and minimum value of 27.69 and 3.74 percent respectively. In addition, the standard deviation of the solvency risk was 4.565 percent.The 3rd independent variable used in the study was credit risk which is measured by loan provisionsdivided by the total loans has a mean value of 3.129 percent with a maximum and minimum value of 0.02 and 15.69 present respectively. It implies that there is small amount of uncollectable balance.The 4th independent variable used in the study was interest rate risk which reflects the real cost of borrowing to the borrower and the real return to the lenderhas a mean value of 11.512 percent with a maximum and minimum value of 14.25 and 9.75 present respectively. The 5th independent variable that used in the study was inflation rate risk has a mean value of 11.9048 with a minimum and maximum value of -10.57 and 36.4 percent respectively. The last but not the least independent variable used in the study was exchange rate risk that calculated as an annual average based on monthly averages more specifically the local currency units (Ethiopian Birr) to the U.S. dollarhas a mean value of13.46 percent with a maximum and minimum value of 27.22 and 8.14 percent respectively. In addition, thestandard deviation was 5.915 percent. This implies that the foreign exchange rate (Ethiopian birr to U, S dollar) in Ethiopiaduring the study period, from 2000 to 2017 remains highly unstable.

Table 4.1: Summary of descriptive statistics ofvariables

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	126	.0331602	.0111108	.0051	.0568
LR	126	.4402016	.164989	.1483	.9577
SR	126	.1195317	.0456508	.0374	.2769
CR	126	.0312937	.0419077	.0002	.1596
IRR	126	.1151167	.0115359	.0975	.1425
InfRR	126	.119048	.1108881	-.1057	.364
ERR	126	13.46216	5.915226	8.1426	27.2246

Source: Researcher**c**omputation through*stata13*

Note: Liquidity risk (LR), Solvency Risk (SR), Credit Risk (CR), Interest Rate Risk (IRR), Inflation Rate Risk (Inf.RR) and Foreign Exchange Rate Risk (ERR).

1.22. Correlation analysis of the variables

Correlation measures the degree of linear association between variables. Values of the correlation coefficient are always ranged between +1 and -1. A correlation coefficient of +1 indicates that

the existence of a perfect positive association between the two variables, while a correlation coefficient of -1 indicates perfect negative association. A correlation coefficient of zero, on the other hand, indicates the absence of relationship (association) between two variables (Brooks, 2008).The table below show the correlation matrix among dependent and independent variables.

Table 4.2: Correlation analysis of the variables

	ROA	LR	SR	CR	IRR	Inf.RR	ERR
ROA	1.0000						
LR	-0.1067	1.0000					
SR	0.1536	-0.0422	1.0000				
CR	-0.2232	0.0818	0.3817	1.0000			
IRR	0.2854	-0.1975	0.1406	0.0626	1.0000		
InfRR	0.4329	0.0854	-0.0148	0.0642	0.4344	1.0000	
ERR	0.2399	-0.4528	0.1320	-0.0163	0.6683	0.1472	1.000

Source: Researcher's computation through stata13

The correlation result in Table 4.2 showedliquidity risk and credit risk have negative correlation influence on ROA for the measurement of the performance of Ethiopian commercial banks.Which means any decrease/increaseincredit risk and liquidity riskleads to an increase/decrease on financial performance of Commercial banks (ROA).However;solvency risk, interest rate risk, inflation rate risk and foreign exchange rate risk have positive correlation influence on ROA for the measurement of the performance of Ethiopian commercial banks.This indicates that any increase/decrease in solvency risk, interest rate risk, inflation rate risk and foreign exchange rate risk leadstoan increase/decrease on financial performance of Commercial banks (ROA).The coefficient estimates of correlation in the above table shows-0.1067 and -0.2232 for credit risk and liquidity risk respectively. This implies thatcredit risk and liquidity risk are lower negatively correlated with ROA and solvency risk, interest rate risk, inflation rate risk and foreign exchange rate riskcoefficient estimates are 0.1536, 0.2854, 0.4329 and 0.2399 respectivelywhich is lower positively correlated with the ROA of Ethiopian commercial banks.Furthermore, the above table 4.2 revealed summery on the degree of correlation between the explanatory variables that have been included in this study. According to Malhotra (2007) stated that multicollinearity problems exists when the correlation coefficient among explanatory

variables should be greater than 0.75. However, Brooks (2008) mentioned that if the correlation coefficient along with the independent variables is 0.8 and above, multicollinearity problems will be existed. However, the correlation matrix in above table 4.2 has shown the absence of a strong relationship among the independent variables.

1.23. Regression model tests

For valid hypothesis testing and to make data available for reliable results, the test of assumption of regression model is required. Accordingly, the study has gone through the most critical regression diagnostic tests consisting of normality, multicollinearity, heteroskedasticityand model specification tests accordingly.

1.23.1. Model Selection (Random Effect versus Fixed Effect Models)

According to Brooks (2008) there are broadly two classes of panel estimator approaches that can be employed in financial research: fixed effects models and random effects models. The choice between both approaches is done by running a Hausman test. To conduct Hausman test the number of cross sections should be greater than the number of coefficients to be estimated. In this study the numbers of cross section are greater than the number of coefficients to be estimated so it is possible to conduct Hausman test. Thus, to determine whether the random effects or fixed effects are necessary this study runs the Hausman specification test as recommended by Brooks (2008) and others. The hypothesis for the model selection test was formulated as follow;

H0: Random effects model is appropriate.

H1: Fixed effects model is appropriate.

$\alpha = 0.05$ Decision Rule: Reject H0 if P value is less than significant level 0.05. Otherwise, do not reject H0. As can be seen in the Appendix C, the p-value was 0.1645. Thus, the random effects model is appropriate since the p value is greater than the significant level 0.05.

Tests for the Classical Linear Regression Model (CLRM) Assumptions

To maintain the data validity and robustness of the regressed result of the research, the basic classical linear regression model (CLRM) assumptions must be tested for identifying any misspecification and correcting them so as to augment the research quality (Brooks, 2008).There are different CLRM assumptions that need to be satisfied and that are tested in this study, which

are: errors equal zero mean test, multicollinearity, heteroscedasticity, model specification test and normality test.

I. **The errors have zero mean (E (ut) = 0)**

This part shows the test for the assumptions of classical linear regression model (CLRM) namely the error has zero mean. Relay on Brooks (2008), the first assumption required is that the average value of the errors is zero. In fact, if a constant term is included in the regression equation, this assumption will never be violated. Hence, this study's regression model has included a constant term, so that this assumption was not violated.

II. **Test for heteroskedasticity assumption (var (ut) = σ2 <∞)**

As shown by Brooks (2008), this assumption requires that the variance of the errors to be constant. If the errors do not have a constant variance, it is said that the assumption of homoscedasticity has been violated. This violation is termed as heteroscedasticity. If heteroscedasticity occur, the estimators of the ordinary least square method are inefficient and hypothesis testing is no longer reliable or valid as it will underestimate the variances and standard errors. There are several tests to detect the Heteroscedasticity problem, which are Park Test, Glesjer Test, Breusch-Pagan-Goldfrey Test, White's Test and Autoregressive Conditional Heteroscedasticity (ARCH) test.

In this study test was used to test for existence of heteroscedasticity across the range of explanatory variables.

H0: The variance of the error is homoscedasticity

H1: The variance of the error is heteroscedasticity

In this study the testforheteroskedasticity was performed by using Breusch Pagan/Cook Weisberg test through the estathettest post estimation command. As can be seen in the Appendix A, the p-value was 0.1159. Therefore, the p-value was not significant to reject the null hypothesis of constant variance. Thus, the conclusion of the test has shown that no evidence of heteroscedasticity and the null hypothesis is accepted. In other words, the study met homoskedasticity assumption.

III. Test of multicolinearity

As referred by Brooks (2008), an implicit assumption that is made when using the OLS estimation method is that the explanatory variables are not correlated with one another. If there is no relationship between the explanatory variables, they would be said to be orthogonal to one another. However, a problem occurs when the explanatory variables are very highly correlated with each other, and this problem is known as multicollinearity. For testing multicollinearity, variance inflation factor (VIF) has performed. VIF is made to ckeck the level of multicollinearity and leads to the tolerance level of multicollinearity (Dinga et al, 2009), according to Gujarati (2004), a VIF statistic below ten implies non-existence of severe multicollinearity problems. Also, tolerance statistic close to one means that there is little collinearity, where as a value close to zero suggests that may be a threat. In the Appendix A, the result showed the mean VIF of 1.61 which implied no need to suspect multicollinearity in the model.

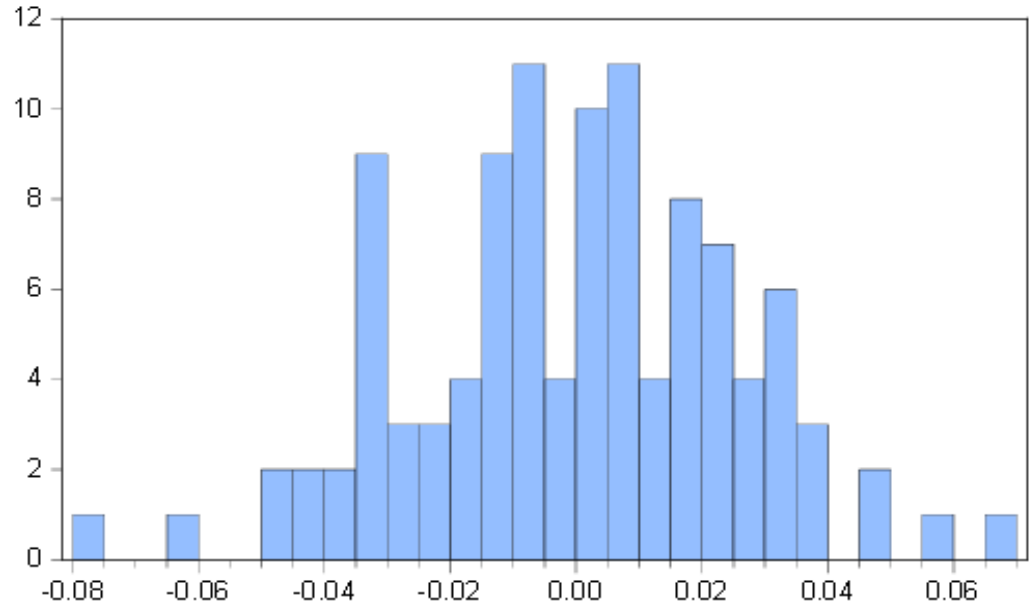
IV. Test of normality (ut∼N(0, σ2)

The examination of the normal distribution of the data of the study is one of the fundamental requirements for linear regression analysis between the study variables. Normality tests are used to determine whether a data set is well-modeled by a normal distribution or not, or to compute how likely an underlying random variable is to be normally distributed (Gujarati, 2009). This assumption requires the disturbances to be normally distributed. Bera-Jarqu normality test which is the most commonly used normality test was conducted for the model. Based on the results shown below, the p-values is insignificant for the model and the researcher failed to reject the null hypothesis, which says the residual value is normally distributed. Thus, there is no normality problem on the data used for this study.The hypothesis for the normality test is formulated as follow:

H0: Error term is normally distributed

H1: Error term is not normally distributed

Figure 4.1Normality Test Result



1

Jarque-Bera normality test: chi2= 120.6

Prob>chi2 0.63

Jarque-Bera test for Ho: normality:

V. Test of Model specification

The last diagnostic test is model specification test.According to Brooks (2008), Specification error occurs when omitting a relevant independent variable, including unnecessary variable or choosing the wrong functional form, so that regression model will be wrongly predicted. This ensures whether the appropriate variables are included and/or omitted from the model. To do this, the researcher employed Ramsey RESET test. In this test, the null hypothesis is that the model has no omitted variables and then based on the result of F-statistics it is accepted or rejected. As can be seen in the Appendix B, the test showed that the F-test is 0.9014. Thus, it is insignificant to reject the null hypothesis. This point out that there are no omitted variables in the model.

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

Table 4.4: REM regression results for the effect of financial risk on the performance of ECBs (2000-2017)

Panel variable: Banks (stronglybalanced) Number of obs = 126

Time variable: Year, 2000 to 2017Number of groups = 7

Obs per group: min = 18

Avg = 18

Max = 18

ROA |	Coef.	Std. Err.	Z	P>|z|	[95% Conf.]	Interval
LR	-.0062132	.0060559	-1.03	0.305	-.0180826	.0056561
SR	.0435908	.0252583	1.73	0.084	-.0059145	.0930962
CR	-.0672022	.0274214	-2.45	0.014**	.0134573	.1209471
IRR	.2748568	.0810086	3.39	0.001*	.1160828	.43363080
Inf.RR	.0433713	.0078433	5.53	0.000 *	.0279986	.0587440
ERR	.0004507	.0001603	2.81	0.005*	.0001365	.0007649
cons	.0283032	.0113792	2.49	0.013	.0060004	.0506061

R-sq: overall = 0.5735 Prob> chi2 = 0.0000 Wald chi2(9) = 84.52

Source: annual report of commercial banks computed by Stata 13

N.B.* Means significant @ 1% which covers 0% up to 1% and ** means significant @ 5%, which covers from 1% up to 5%.

1.24.1. 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 would be observed under the null hypothesis that a particular predictor's regression coefficient is zero, given that the rest of the predictors are in the model. In other words, P-value indicates at what percentage or precession level of each variable is significant exceptliquidityand solvency risks. *Overall R-sq*R-square value measures how well the regression model explains the actual variations in the dependent variable (Brooks, 2008). Overall R-square statistics of the model was 57.35%. The overall R-sq. value 57.35% indicates that the dependent variable of return on asset of Ethiopian

commercial banks is well explained by the six independent variables that are listed in the model. Thus, these variables collectively are good explanatory variables to identify the effect of financial risks on the Ethiopian commercial banks' performance.

In the regression the p-value of zero attached to the test statistic reveal that the null hypothesis that all of the coefficients are jointly zero should be rejected. Thus, it implies that the independent variables in the model were able to explain variations in the dependent variable. The coefficient for liquidity risk (LR) is--0.0062132onROA which indicates that the liquidity risk of Ethiopian commercial banks had a negative influence onROA but the relationship is insignificant at 5% level of significant. In addition to this, the coefficient for solvency risk (SR) is0.0435908 on ROA which refers that solvency riskhad positive butinsignificant influence on ROA at 5% level of significant. Subsequent to this, the coefficient for credit risk(CR) is--0.0672022on ROA which denotes that credit risk had anegative and significant influence on ROA at 5% level of significant. However, the coefficient for interest rate risk (IRR) is 0.2748568 onROA which refers that interest rate risk had negative and significant influence on ROA at 1% level of significant.

In addition to this,the coefficient forInflation Rate Risk (Inf.RR)is 0.0433713on ROA which states that inflation rate risk had negative and significant influence on ROA at 1% level of significant. Finally, the coefficient for exchange rate risk (ERR) is 0.0004507 onROA which states that ERRhadpositive and significant influence on ROA at 1% level of significant. Std. Err: –these are the standard errors of the individual regression coefficients. They are used in both the calculation of the z test statistic, superscript i, and the confidence interval of the regression coefficient, superscript k.Z– 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 Coef. is not equal to zero.

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

This section summarizes the expected relationship and the actual relationship of the six independent variables specifically, Liquidity Risk (LR), Solvency Risk (SR), Credit Risk (CR), Interest rate risk (IRR), Inflation rate risk (Inf. RR) and Exchange Rate Risk (ERR)withReturnof Asset (ROA) of Ethiopian commercial banks during the study period from 2000 to 2017.

I. **Liquidity Risk(LR)**

The random effects panel data model regression result on table 4.3revealed thatliquidity riskanegative but insignificant influence on Return of Asset (ROA) of the Ethiopian commercial banks for the study period (2000-2017). The relation is statistically insignificant at 5% significant level with a coefficient of (--0.0062132) in determining ROA of the Ethiopian commercial banks.

Holding other independent variables constant at their average value, when liquidity risk (LR) increased by one percent, return on asset (ROA) of sampled Ethiopian commercial banks would be decreased by 0.62132%, but statistically insignificant at 5% of significance level. In other words, there is insignificant negative relationship between liquidity risk (LR) and return on asset (ROA) of sampled Ethiopian commercial banks. Therefore, the researcher rejects the null hypothesis that there is positive relationship between LR and ROA. This means, there is no sufficient evidence to support the positive relationship between LR and ROA.

In contrary to the hypothesis of this research, LR shows a negative relationship with return on asset (ROA) of sampled Ethiopian commercial banks. The result is consistent with the findings of (Yuqi, 2006) (Guru et al, (1999) and (Dawit, 2016). Liquidity risk of the sample Ethiopian commercial banks included in this study has no significant relationship with return on asset, in contrast, many previous studies for instance (Bourke, 1989), (Yuqi , 2006), and (Tobias &Themba , 2011) stated that liquidity is the major causes of bank failure.

The possible reason for the negative association between LR and ROA could be attributed to the fact that, Ethiopian banking industry holds more liquid assets rather than to disburse it as a loan and earn more interest income.

II. **Solvency Risk (SR)**

The random effects panel data model regression result of this study on table 4.3 revealed that solvency riskhad a positive but insignificant influence on ROA of the Ethiopian commercial banks for the study period of 2000-2017. The relation is insignificant at 5% significant level with a coefficient of (0.0435908) in determining the ROA of the Ethiopian commercial banks.

The finding of this study suggests that solvency risk does not have influence on the Ethiopian commercial banks' performance since the study could not get enough statistical significance.The finding of this is consistent with the finding of Dawit(2016).

III. **Credit Risk (CR)**

The random effects panel data model regression result of this study on table 4.3revealed that credit risk had a negative and significant influence on ROA of the Ethiopian commercial banks for the study period of 2000-2017. The relation is significant at 5% significant level with a coefficient of (--0.0672022) in determining the ROA of the Ethiopian commercial banks.

This implies that when credit risk (CR) increased by one percent, return on asset (ROA) of sampled Ethiopian commercial banks would be decreased by 6.72 %, and statistically significant at 5% of significance level. The effect is negative as expected and this negative relationship between performance and credit risk implies that increase in credit risk ratio leads to deteriorationof performance in terms of ROA. The result of this study is consistent with the findings 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 with the finding of (Louzis et al. (2012).

Therefore, Ethiopian commercial banks should be developed their credit risk management capacity by considering the practice of other developing countries which have better experience in the industry- the high level of provision held for poorly performing assets mainly loans and advances is affecting the performance of Banks. Therefore, improving performance requires instituting a strong credit risk management system that can efficiently identify bankable borrowers and there must be a system that can monitor their performance after the loan is granted. Besides to this, the regulatory framework of Ethiopia 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.

IV. **Interest rate risk (IRR)**

The random effects panel data model regression result of this study on table 4.3revealed that interest rate risk had a positive and significant influence on ROA of the Ethiopian commercial banks for the study period of 2000-2017. The relation is significant at 1% significant level with a coefficient of (0.2748568) in determining the ROA of the Ethiopian commercial banks.

This implies that when interest rate increased by one percent, return on asset (ROA) of sampled Ethiopian commercial banks would be increased by 27.485 %, and statistically significant at 1% of significance level.

The finding of this is consistent with the finding of Alper and Anbar (2011), empirical evidence from Molyneux and Thornton (1992) indicate that high interest rate is significantly associated with higher bank profitability, i.e. a significant positive relationship. Contrary wise, Naceur (2003) highlights a negative relationship between interest rates and bank profitability.

V. Inflation rate risk (Inf. RR)

The random effects panel data model regression result of this study on table 4.3revealed that inflation rate risk had a positive and significant influence on ROA of the Ethiopian commercial banks for the study period of 2000-2017. The relation is significant at 1% significant level with a coefficient of (0.0433713) in determining the ROA of the Ethiopian commercial banks.

This implies that when inflation rate is increased by one percent, return on asset (ROA) of sampled Ethiopian commercial banks would be increased by 4.337 %, and statistically significant at 1% of significance level.

The beta coefficients were positive showing that an increase in inflation improves profitability of commercial banks. The finding of this is in line with Hooshyari and Moghanloo,2015; Edna, 2018) who evaluated the impact of inflation on profitability of banks and revealed that there is a strong correlation between inflation and profitability of banks in Iran and Lelissa, 2014; Athanasoglou et al., 2008; Guru et al., 2002; Demirgüç-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.In contrary,the findings of Habtamu, 2012; Tigist,2014;Amdemikael, 2012;Belayneh, 2011; Rao & Tekeste, 20112;Tesfaye, 2013;Enyew, 2013;Damena, 2011; Birhanu, 2012; Samuel, 2015 and Dawit, 2016 imply that inflation didn’t have significant effect on performance of Ethiopian commercial banks.

VI. Foreign Exchange Rate Risk (ERR)

The random effects panel data model regression result of this study on table 4.3revealed that exchange rate risk had a positive and significant influence on ROA of the Ethiopian commercial banks for the study period of 2000-2017. The relation is significant at 1% significant level with a

coefficient of (0.0004507) in determining the ROA of the Ethiopian commercial banks. This implies that the variation in exchange rate had positively influence on the Ethiopian commercial banks performance during the study period. It indicated that during the study period an increase of USD to ETB by one birr (depreciation of Ethiopia birr) caused the Ethiopian commercial banks performance (ROA) to increase by 0.04508% or a decrease of USD to ETB by one birr (appreciation of Ethiopian birr) caused the Ethiopian commercial banks performance (ROA) to decrease by 0.04508%.The positive relationship between exchange rate and financial performance the Ethiopian commercial banks may reflect how fluctuating and volatile exchange rate may have contributed to the growth of performance of banks. This may be attributed to the fact that many imports are paid by the locals using the dollar and, with the birr weakening against the dollar, the banks are making an arbitrage profit.

The finding of this study is consistent with the findings ofBabazadeh&Farrokhnejad, 2012;Osuagwu, 2014; He et al ,2014 and Carolyn,2016.

Table 4.4: Comparison of test result with expectation

Independent Variables	Expected Relationships with ROA	Actual result	Statistical Significance test	Hypothesis Status
Liquidity Risk	__	__	Insignificant	Reject
Solvency Risk	+	+	Insignificant	Reject
Credit Risk	__	__	Significant at 5%	Failed to Reject
Interest rate risk	+	+	Significant at 1%	Failed to Reject
Inflation rate risk	__	+	Significant at 1%	Reject
Exchange Rate Risk	+	+	Significant at 1%	Failed to Reject

Source: Compiled by the researcher

CHAPTER FIVE

12.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.

1.25. Summary

The overall objective of this study is to analyze effects of financial risks on the performance of Ethiopian Commercial banks (EBCs).In doing so, the study covered the data of seven commercial banks in Ethiopia from the period 2000-2017. To achieve the intended objective, the study usedsecondary sources. Furthermore, the study usedrandom effect panel regression model for six variables of the study that wereliquidity risk, solvency risk, credit risk, interest rate risk, inflation rate risk and foreign exchange rate risk.

Regarding the raw datathat used to calculateliquidity risk, solvency risk and credit riskwere collected from the audited financial statements (annual reports) of the sampled Ethiopian commercial bankshead office and the raw data that used to calculate interest rate risk, inflation rate risk and foreign exchange rate risk were found from MoFED.Andthe outputs of the study were computed by using STATA version 13.

Data was analyzed by using descriptive statistics /multiple regression models, in doing sorandom effect panel regression modelemployed to measure estimators. And then test for CLRM were made and all the data fitted the assumptions; the data was found to be homoskedastic, free of autocorrelation, free of Multi-collinearity and normally distributed, finally therandom effect regression results were presented and analyzed; hence, the findings of this study proved that credit risk, interest rate risk, inflation rate risk and foreign exchange rate riskwere statistically significant whereasliquidity and solvency risks wereinsignificance effect on the performance of thesampled Ethiopian commercial banks.

Besides to this, the findings of this study revealed thatliquidity and credit risks have a negative coefficient.However,the left independent variables have positive coefficient. Finally, the coefficient of the overall R-sq. value is 57.35% indicates that the dependent variable of return on asset of the sampled Ethiopian commercial bankswere well explained by the six independent variables that are listed in the model.

1.26. Conclusionsof Key Findings

According to the random effects panel data model regression result interest rate risk, inflation rate risk and foreign exchange rate riskhavestatistically significantimpactandpositive relationshipon ROA, while credit risk has statistically significant but negative influence on the financial performance (ROA) of the Ethiopian commercial banks. Therefore, the mainfinancial risks the affect on the performance of the sampled Ethiopian commercial banks are credit risk, interest rate risk, inflation rate risk and foreign exchange rate riskas they have statistically significant impact at confidence level of 99% and 95%. This conclusion indicates that theany increase/decrease in interest rate risk, inflation rate risk and foreign exchange rate risk leads to an increase/decrease on financial performance of the sampledcommercial banks (ROA). While credit risk has significant impact on ROA with a negative relationship; which means any decrease/increase on the value of this variable leads to an increase/decrease on financial performance of Commercial banks (ROA).

Whileany decrease/increase incredit risk leads to an increase/decrease on financial performance of Commercial banks (ROA). However, liquidity and solvency risks are not significantly affect on the performance (ROA) of the sample Ethiopian commercial banks.

1.27. Recommendations

Based on the research findings the following reachable recommendations were forwarded;

- Credit risk has a negative and significant influence on ROA of the Ethiopian commercial banks. Thus, to overcome this problem the Ethiopian commercial banksshould evaluatethe 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 allthe lending requirements stipulated in order to enhance financial performance. Furthermore, the study strongly recommendedthat 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 need for commercial banks to adopt credit risk management practices. Such practices include 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 recommendsto the Ethiopiangovernment and National Bank of Ethiopian regarding to 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 bodylikeNational bank of Ethiopia should implement sound policies and measures of maintain interest rates in the economy. Therefore, National bank of Ethiopia should strengthen on its monetary policies to regulate the level of interest rates (lending rate) in an economy.
- Based on the findings and conclusions of the study, this study strongly recommendsto theNational Bank of Ethiopiaproper fiscal and monetary policies should be enforced to control the level of inflation in an economy.

1.28. 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 2000 to 2017. However, it is recommended for further study can be extended by including more variables such as macroeconomic variables (GDP etc.) and also by including other new bank specific variables other than included in thisstudy.

13.References

Adrian, R. (2014).The Relationship between Financial Risk and Financial Performance insurance companies in Kenya.Unpublished Master's Thesis.University of Nairobi.

Alper, D., Anbar, A.(2011). "Bank Specific and Macroeconomic Determinants of Commercial Bank Profitability: Empirical Evidence from Turkey", Business and Economics Research Journal, Vol. 2, No. 2, pp. 139-152.

Ameur, I.G.B, Mhiri, S.M.,"Explanatory(2013). Factors of Bank Performance Evidence from Tunisia", International Journal of Economics, Finance and Management, Vol. 2, No. 1,

Amdemikael(2012). Factors affecting profitability: an empirical study on Ethiopian banking industry, MSc project paper, Addis Ababa University.

Anthony, M. & David, F. (1997). Financial Risk Management by Insurers: An Analysis of the Process. The Journal of Risk and Insurance, 64(2), 231-270.

Arif, A. &Showket, A. (2015). Relationship between Financial Risk and Financial Performance: An Insight of Indian Insurance Industry. International Journal of Science and Research, 4(11), 1424-1433.

Athanasoglou P.P., Brissimis S.N., Delis M.D.,(2008). Bank-Specific, Industry-Specific and Macroeconomic Determinants of Bank Profitability. Journal of International Financial Markets, Institutions and Money, Vol. 18, No. 2, pp. 121-136.

Athanasoglou, P. P., Delis, M. D., &Staikoras, C. C. (2014).Determinants of Bank Profitability in the SouthEastern European Region. Bank of Greece, Working Paper No. 47, September 2003.

Ayanda, M., Chirstopher, I, Mudashiru, A. (2013), Determinants of banks profitability in a developing economy: Evidence from Nigerian Banking Industry. Institute of Interdisciplinary Business Research 1 5 5, January 2013, VOL 4, NO 9.

Ayadi, Boujelbene,(2012). "The ratio of the bank assets to the GDP (ASSGDP) has a negative and statistically significant impact on bank profitability, reflecting a more intense inter-bank competition in the financial systems".

Barges, A. (1963). The effect of capital structure on the cost of capital: a test and evaluation of the Modigliani and Miller propositions. Englewood Cliffs, NJ, Prentice-Hall.

Belayneh(2011), determinants of commercial banks profitability: an empirical review of Ethiopian commercial banks, MSc project paper, Addis Ababa University.

Birhanu(2012). Determinants of commercial banks profitability: empirical evidence from the commercial banks of Ethiopia, MSc project paper, Addis Ababa University.

Brooks, C. (2008).Introductory Econometrics for Finance.2ndedn, Cambridge University Press, New York.

Chamberlain, S., Howe, J. S., and Popper, H. (1997). “The Exchange Rate Exposure of U.S. and Japanese Banking Institution”, Journal of Banking and Finance, 21(6),pp.871-92.

Creswell J. W 2009, Research design: Qualitative and quantitative approaches, 3rd ed, Sage Publications, London UK.

Crouhy, M., Galai, D. and Mark, R.(2006). Risk Capital Attribution and Risk-Adjusted Performance Measurement, in Ong, M. (eds.) Risk Management: A Modern Perspective. Burlington, Elsevier.

Demirgüç-Kunt A., Huizinga H., 2000.Financial structure and bank profitability. The World Bank, Policy Research Working Paper 2430.

Eneyew, L. (2013).Financial Risks and Profitability of Commercial Banks in Ethiopia.Unpublished Master’s Thesis.Addis Ababa University.

Evans. O (2014).effects of macroeconomic factors on commercial banks profitability in Kenya: Case of Equity bank limited.

Fang, W, Dengchia, L. and M.Miller, S. (2005). Export promotion through exchange rate policy: Exchange rate depreciation or stabilization ? . Working paper 2005-07.

Flamini, V., McDonald, C., Liliana Schumacher, L. (2009)."The Determinants of Commercial Bank Profitability in SubSaharan Africa", IMF Working Paper.

Frederick, N.K. (2015). "Factors Affecting Performance of Commercial Banks in Uganda -A Case for Domestic Commercial Banks", International Review of Business Research Papers Vol. 11, No. 1. pp. 95 – 113.

Garcia, H.A., Gavila, S. &Santabarbara, D. (2009), What explain the low profitability ofChinese banks? Journal of Banking and Finance, 33(11), 2080-2092

Gerald, K. & Ulrike, O. (2001).Systemic Risk Factors in the Insurance Industry and Methods for Risk Assessment.

Gordon, L., Loeb, M., & Tseng, C. (2009). Enterprise Risk Management and Firm Performance: A Contingency Perspective. Journal of Accounting and Public Policy, 28, 301-327.

Habtamu(2012). Determinants of bank profitability: an empirical study on Ethiopian private commercial banks, MSc project paper, Addis Ababa University.

He, L.T, Fayman, A and Casey, K.M. (2014). Banks Profitability: The impact of foreign currency fluctuations. Journal of Applied Business and Economics vol. 16(2) 2014

Hinson, D & Kowalski, L. 2008, Roles and Responsibilities for Contingency Planning. London: UCL Press.

Holton, G. 2004, Defining Risk. Financial Analysts Journal, 60(6), 19-25.

Jacques, K. & Nigro.1997, Risk-Based Capital, Portfolio Risk and Bank Capital: A Simultaneous Equations Approach. Journal of Economics and Business, 49, 533-547.

Jeffrey A. Frankel. (2018). "Foreign Exchange." The Concise Encyclopedia of Economics.2008.Library of Economics and Liberty. Retrieved from the World Wide Web: *http://www.econlib.org/library/Enc/ForeignExchange.html*

Kiganda,E.2014, Effects of Macroeconomic factors on Commercial Banks profitability in Kenya: case of equity bank limited. International Journal of Economics and sustainable development, Vol. 5, No. 2, 2014, ISSN 2222-1700 (Paper) ISSN 2222-2855 (Online).

Kithinji. O. 2010, Credit Risk Management and Profitability of Commercial Banks in Kenya. School of Business, University Of Nairobi, Nairobi – Kenya

Lelissa, T.B. (2014)"The Determinants of Ethiopian Commercial Banks Performance", European Journal of Business and Management Vol. 6, No.14.

Liargovas, P. & Skandalis, K.2008, Factor affecting firms' financial performance: The Case of Greece, Athens: University of Peloponnese Press.

Mbutor, M.2010,Exchange rate volatility, stock price fluctuations and the lending behavior of banks in Nigeria Research Department, Central Bank of Nigeria.

Ongore, O.V. &Kusa, B.G. 2013, Determinants of financial performance ofcommercial banks in Kenya. International Journal of Economics and FinancialIssues, 3(1), 237-252

Ralph, C. 2000, Failures in Risk Management. England Economic Review.

Rejda, E. 2003, Principles of Risk management and Insurance: New York, Pearson education Inc.

Sabri, M.2011, Foreign exchange risk management in commercial banks of Pakistan. The University of Lahore.

Sufian, F., and Habibullah, M.S. 2009: (2007-2017). "Determinants of bank profitability in a developing economy: Empirical evidence from the Bangladesh." Journal of Business Economics and Management, Vol.10, No.3.

Sufian F., Noor M.A., 2012. Determinants of Bank Performance in a Developing Economy: Does Bank Origins Matters? Global Business Review, Vol. 13, No. 1, pp. 1-23.

Songul, K. 2013, Turkish banking sector’s profitability factors.

Stancik, J. 2006, Determinants of exchange rate Volatility: the case study of the new EU members, Discussion paper No. 2006-158.

Trujillo-Ponce, A. 2012, What determines the profitability of banks? Evidence from

Spain working papers, Pablo de Olavide University

Wenk, D. 2005, Risk Management and Business Continuity, Overview and Perspective. Journal of the Chartered Insurance Institute, 3(3), 234-246.

Wong,E., Wong, J. and Leung, P. (2008). “The foreign exchange exposure of Chinese banks” Working paper 07/2008

Umar, M., Maijama, D., Adamu, M.,"Conceptual(2014) exposition of the effect of inflation on bank performance", Journal of World Economic Research 3(5) [62]

Van den Heuvel, S.J. (2003)."Does Bank Capital Matter for Monetary Transmission?", Federal Reserve Bank of New York, Economic Policy Review, May, pp. 258-65.

Appendix A

The Classical Linear Regression Model (CLRM) Assumptions

Heteroskedasticity test

```
. hettest

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

         chi2(1)      =     2.47
         Prob > chi2  =   0.1159
```

.

Multicollinearity test

. vif

```
. vif
```

Variable	VIF	1/VIF
IRR	2.33	0.429786
ERR	2.30	0.434759
InfRR	1.32	0.757728
LR	1.31	0.761513
SR	1.21	0.826920
CR	1.19	0.838213
Mean VIF	1.61	

Appendix B

Functional form test

Ramsey RESET test using powers of the fitted values of EFF

Ho: model has no omitted variables

```
. ovtest

Ramsey RESET test using powers of the fitted values of ROA
       Ho:  model has no omitted variables
                  F(3, 116) =      0.19
                   Prob > F =      0.9014
```

Appendix C

Hausman fixed random

. Hausman fe re

---- Coefficients ----

(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	fe	re	Difference	S.E.
LR	-0.0046	- 0.0016	0.0017	0.0017
SR	0.05727	0.04359	0.01368	0.0207
CR	- 0.0981	-0.0678	0.0309	0.0298
IRR	0.2748	0.2749	-3.39e	
ERR	0.00045	0.00045	1.52e	
Inf. RR	0.0434	0.0434	-1.31e	0.0007

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

Test:  Ho:  difference in coefficients not systematic

           chi2(6) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                   =         9.16
         Prob>chi2 =       0.1645
         (V_b-V_B is not positive definite)
```

Appendix D: Summary of ratio data

Years	ROA	LR	SR	CR	IRR	Inf.RR	ERR	BANK

2000	0.0294	0.401	0.0611	0.0002	0.1275	0.0540	8.1426	**CBE**
2001	0.0092	0.392	0.0556	0.0003	0.0975	-0.0030	8.3279	**CBE**
2002	0.0229	0.428	0.0374	0.0021	0.0975	-0.1057	8.5425	**CBE**
2003	0.0290	0.6909	0.0554	0.0014	0.0975	0.1092	8.5809	**CBE**
2004	0.0179	0.7376	0.0517	0.0003	0.1050	0.0735	8.6197	**CBE**
2005	0.0238	0.6887	0.0430	0.0003	0.1050	0.0612	8.6518	**CBE**
2006	0.0306	0.7497	0.0420	0.0035	0.1050	0.1058	8.6810	**CBE**
2007	0.0270	0.7806	0.0973	0.0010	0.1150	0.1582	8.7943	**CBE**
2008	0.0371	0.474	0.0906	0.0027	0.1225	0.2530	9.2441	**CBE**
2009	0.0458	0.3591	0.0848	0.0004	0.1225	0.3640	10.4205	**CBE**
2010	0.0379	0.2855	0.0746	0.0005	0.1188	0.0280	12.8909	**CBE**
2011	0.0371	0.3569	0.0546	0.0025	0.1188	0.1810	16.1178	**CBE**
2012	0.0499	0.2153	0.0485	0.0089	0.1188	0.3410	17.2536	**CBE**
2013	0.0438	0.233	0.0470	0.0288	0.1188	0.1350	18.1947	**CBE**
2014	0.0399	0.2113	0.0441	0.0062	0.1188	0.0812	19.0748	**CBE**
2015	0.0424	0.2234	0.0456	0.0050	0.1188	0.0815	21.28	**CBE**
2016	0.0321	0.2156	0.0547	0.0043	0.1218	0.1025	22.40	**CBE**
2017	0.0438	0.2436	0.0674	0.0067	0.1425	0.1224	27.20	**CBE**
2000	0.0207	0.4345	0.1014	0.0045	0.1275	0.0540	8.1426	**AIB**
2001	0.0256	0.4423	0.1160	0.0489	0.0975	-0.0030	8.3279	**AIB**
2002	0.0089	0.4333	0.0979	0.0219	0.0975	-0.1057	8.5425	**AIB**
2003	0.0120	0.4768	0.0842	0.0067	0.0975	0.1092	8.5809	**AIB**
2004	0.0203	0.5084	0.0828	0.0050	0.1050	0.0735	8.6197	**AIB**
2005	0.0211	0.4464	0.0807	0.0048	0.1050	0.0612	8.6518	**AIB**
2006	0.0211	0.3619	0.0807	0.0058	0.1050	0.1058	8.6810	**AIB**
2007	0.0364	0.3625	0.0928	0.0030	0.1150	0.1582	8.7943	**AIB**
2008	0.0375	0.4766	0.1009	0.0190	0.1225	0.2530	9.2441	**AIB**
2009	0.0425	0.6422	0.1067	0.0170	0.1225	0.3640	10.4205	**AIB**
2010	0.0389	0.6621	0.1063	0.0060	0.1188	0.0280	12.8909	**AIB**
2011	0.0455	0.5228	0.1205	0.0055	0.1188	0.1810	16.1178	**AIB**
2012	0.0404	0.3434	0.1258	0.0021	0.1188	0.3410	17.2536	**AIB**
2013	0.0328	0.2847	0.1162	0.0074	0.1188	0.1350	18.1947	**AIB**
2014	0.0375	0.1547	0.1175	0.0045	0.1188	0.0812	19.0748	**AIB**
2015	0.0342	0.1483	0.1189	0.0007	0.1188	0.0815	21.28	**AIB**
2016	0.03348	0.2345	0.1218	0.0009	0.1218	0.1025	22.40	**AIB**

2017	0.0421	0.2467	0.1315	0.0673	0.1425	0.1224	27.20	**AIB**
2000	0.0196	0.3902	0.0834	0.0478	0.1275	0.0540	8.1426	**DB**
2001	0.0297	0.4014	0.0717	0.0008	0.0975	-0.0030	8.3279	**DB**
2002	0.0246	0.4274	0.0783	0.0457	0.0975	-0.1057	8.5425	**DB**
2003	0.0185	0.4004	0.0647	0.0947	0.0975	0.1092	8.5809	**DB**
2004	0.0293	0.4004	0.0643	0.0256	0.1050	0.0735	8.6197	**DB**
2005	0.0285	0.3604	0.0710	0.0423	0.1050	0.0613	8.6518	**DB**
2006	0.0408	0.3112	0.0849	0.0687	0.1050	0.1058	8.6810	**DB**
2007	0.0429	0.3438	0.0901	0.0456	0.1150	0.1582	8.7943	**DB**
2008	0.0424	0.4739	0.0932	0.0123	0.1225	0.253	9.2441	**DB**
2009	0.0362	0.5934	0.0934	0.0430	0.1225	0.364	10.4205	**DB**
2010	0.0371	0.518	0.0909	0.0345	0.1188	0.028	12.8909	**DB**
2011	0.0430	0.5258	0.0953	0.0238	0.1188	0.181	16.1178	**DB**
2012	0.0510	0.4105	0.1043	0.0456	0.1188	0.341	17.2536	**DB**
2013	0.0412	0.3824	0.1036	0.0177	0.1188	0.135	18.1947	**DB**
2014	0.0436	0.2907	0.1183	0.0234	0.1188	0.0812	19.0748	**DB**
2015	0.0389	0.2791	0.1181	0.0008	0.1188	0.0815	21.18	**DB**
2016	0.0333	0.3019	0.1175	0.0023	0.1218	0.1025	22.40	**DB**
2017	0.0283	0.1891	0.1153	0.0074	0.1425	0.1224	27.20	**DB**
2000	0.0295	0.6123	0.1721	0.0007	0.1275	0.0540	8.1426	**BOA**
2001	0.0400	0.5234	0.1640	0.0056	0.0975	-0.0030	8.3279	**BOA**
2002	0.0061	0.7513	0.1192	0.0037	0.0975	-0.1057	8.5425	**BOA**
2003	0.0054	0.6028	0.1045	0.0090	0.0975	0.1092	8.5809	**BOA**
2004	0.0330	0.5451	0.1165	0.0097	0.1050	0.0735	8.6197	**BOA**
2005	0.0368	0.5595	0.1135	0.0068	0.1050	0.0613	8.6518	**BOA**
2006	0.0408	0.4861	0.1333	0.0154	0.1050	0.1058	8.6810	**BOA**
2007	0.0265	0.4919	0.1126	0.0234	0.1150	0.1582	8.7943	**BOA**
2008	0.0051	0.5671	0.0984	0.0022	0.1225	0.253	9.2441	**BOA**
2009	0.0265	0.6874	0.0948	0.0077	0.1225	0.364	10.4205	**BOA**
2010	0.0313	0.6931	0.0932	0.0036	0.1188	0.028	12.8909	**BOA**
2011	0.0355	0.5868	0.0908	0.0009	0.1188	0.181	16.1178	**BOA**
2012	0.0350	0.4236	0.1100	0.0023	0.1188	0.341	17.2536	**BOA**
2013	0.0346	0.2557	0.1090	0.0034	0.1188	0.135	18.1947	**BOA**
2014	0.0312	0.2435	0.1356	0.0045	0.1188	0.0812	19.0748	**BOA**
2015	0.0265	0.2595	0.1175	0.0045	0.1188	0.0815	21.18	**BOA**
2016	0.0290	0.2276	0.1262	0.0024	0.1218	0.1025	22.40	**BOA**

2017	0.0278	0.16627	0.1147	0.0059	0.1425	0.1224	27.20	**BOA**
2000	0.0139	0.4783	0.0968	0.0746	0.1275	0.0540	8.1426	**WB**
2001	0.0243	0.4535	0.0992	0.0674	0.0975	-0.0030	8.3279	**WB**
2002	0.0195	0.4841	0.0988	0.0784	0.0975	-0.1057	8.5425	**WB**
2003	0.0171	0.415	0.1061	0.0453	0.0975	0.1092	8.5809	**WB**
2004	0.0391	0.3978	0.1129	0.0455	0.1050	0.0735	8.6197	**WB**
2005	0.0392	0.3794	0.1115	0.0347	0.1050	0.0613	8.6518	**WB**
2006	0.0417	0.2996	0.1127	0.0478	0.1050	0.1058	8.6810	**WB**
2007	0.0438	0.3704	0.1159	0.1099	0.1150	0.1582	8.7943	**WB**
2008	0.0461	0.5396	0.1468	0.1345	0.1225	0.253	9.2441	**WB**
2009	0.0500	0.7082	0.1634	0.1455	0.1225	0.364	10.4205	**WB**
2010	0.0553	0.7434	0.1832	0.1365	0.1188	0.028	12.8909	**WB**
2011	0.0568	0.7066	0.1659	0.1456	0.1188	0.1810	16.1178	**WB**
2012	0.0549	0.5106	0.1922	0.1175	0.1188	0.3410	17.2536	**WB**
2013	0.0433	0.3388	0.1761	0.1325	0.1188	0.1350	18.1947	**WB**
2014	0.0359	0.3618	0.1860	0.1235	0.1188	0.0812	19.0748	**WB**
2015	0.0258	0.2128	0.1960	0.1425	0.1188	0.0815	21.18	**WB**
2016	0.0296	0.2570	0.1847	0.1528	0.1218	0.1025	22.40	**WB**
2017	0.0338	0.2515	0.1745	0.1596	0.1425	0.1224	27.20	**WB**
2000	0.0286	0.4316	0.2520	0.0977	0.1275	0.0540	8.1426	**UB**
2001	0.0363	0.4429	0.2769	0.0867	0.0975	-0.0030	8.3279	**UB**
2002	0.0198	0.4427	0.2676	0.0543	0.0975	-0.1057	8.5425	**UB**
2003	0.0144	0.446	0.1776	0.0245	0.0975	0.1092	8.5809	**UB**
2004	0.0148	0.4669	0.1424	0.0345	0.1050	0.0735	8.6197	**UB**
2005	0.0400	0.4814	0.1164	0.0654	0.1050	0.0613	8.6518	**UB**
2006	0.0373	0.3718	0.1196	0.0873	0.1050	0.1058	8.6810	**UB**
2007	0.0398	0.4847	0.1648	0.0876	0.1150	0.1582	8.7943	**UB**
2008	0.0387	0.608	0.1439	0.0985	0.1225	0.253	9.2441	**UB**
2009	0.0287	0.782	0.1118	0.0785	0.1225	0.364	10.4205	**UB**
2010	0.0420	0.7739	0.1081	0.0957	0.1188	0.028	12.8909	**UB**
2011	0.0418	0.6951	0.1167	0.0563	0.1188	0.1810	16.1178	**UB**
2012	0.0463	0.4847	0.1254	0.0324	0.1188	0.3410	17.2536	**UB**
2013	0.0375	0.3675	0.1204	0.0234	0.1188	0.1350	18.1947	**UB**
2014	0.0304	0.3756	0.1326	0.0146	0.1188	0.0812	19.0748	**UB**
2015	0.02	0.957	0.1324	0.0124	0.1188	0.0815	21.18	**UB**

	49	7						
2016	0.0248	0.5678	0.1235	0.0043	0.1218	0.1025	22.40	**UB**
2017	0.0183	0.7520	0.1278	0.0032	0.1425	0.1224	27.20	**UB**
2000	0.0059	0.4379	0.2092	0.0034	0.1275	0.0540	8.1426	**NIB**
2001	0.0455	0.4718	0.1576	0.0078	0.0975	-0.0030	8.3279	**NIB**
2002	0.0370	0.4785	0.1661	0.0025	0.0975	-0.1057	8.5425	**NIB**
2003	0.0190	0.4712	0.1230	0.0076	0.0975	0.1092	8.5809	**NIB**
2004	0.0349	0.4925	0.1237	0.0037	0.1050	0.07345	8.6197	**NIB**
2005	0.0344	0.4665	0.1168	0.0067	0.1050	0.0613	8.6518	**NIB**
2006	0.0393	0.3588	0.1406	0.0090	0.1050	0.1058	8.6810	**NIB**
2007	0.0404	0.3756	0.1631	0.0089	0.1150	0.1582	8.7943	**NIB**
2008	0.0435	0.4148	0.1639	0.0098	0.1225	0.2530	9.2441	**NIB**
2009	0.0457	0.6	0.1516	0.0017	0.1225	0.364	10.4205	**NIB**
2010	0.0478	0.5764	0.1535	0.0013	0.1188	0.0280	12.8909	**NIB**
2011	0.0484	0.4767	0.1646	0.0024	0.1188	0.1810	16.1178	**NIB**
2012	0.0471	0.3726	0.1846	0.0056	0.1188	0.3410	17.2536	**NIB**
2013	0.0414	0.232	0.1822	0.0065	0.1188	0.1350	18.1947	**NIB**
2014	0.0386	0.2247	0.1828	0.0044	0.1188	0.0812	19.0748	**NIB**
2015	0.0333	0.1839	0.1848	0.0023	0.1188	0.0815	21.18	**NIB**
2016	0.0290	0.2397	0.1786	0.0043	0.1218	0.1025	22.10	**NIB**
2017	0.0324	0.1999	0.1895	0.0039	0.14251	0.1224	27.20	**NIB**

`