Financial Risks and Profitability of Commercial Banks in Ethiopia

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DECLARATION

I, Eneyew Lake declare that this thesis entitled ***"Financial risks and Profitability of Commercial Banks in Ethiopia"*** is outcome of my own effort and study and that all sources of materials used for the study have been duly acknowledged. I have produced it independently except for the guidance and suggestion of the thesis Advisor.

This study has not been submitted for any degree in this University or any other University. It is offered for the partial fulfillment of the degree of Masters of Science in Accounting and Finance.

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CERTIFICATE

This is to certify that thesis entitled, ***"Financial Risks and Profitability of Commercial Banks in Ethiopia"***, undertaken by Eneyew Lake for the partial fulfillment of degree of Master of Science in Accounting and Finance at Addis Ababa University, is an original work and not submitted earlier for any degree either at this University or any other University.

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This is to certify that the thesis prepared by Eneyew Lake, entitled: *Financial Risks and Profitability of Commercial Banks in Ethiopia* and submitted in partial fulfillment of the requirements for the degree of Degree of Master of Science (Accounting and Finance) complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

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Abstract

Financial risks and Profitability of Commercial Banks in Ethiopia

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Commercial banks assume various kinds of financial risks which are related to the financial operation of a business and arise due to the uncertainty in movement of foreign exchange rates, interest rates, credit quality, and liquidity position. Risk may have positive or negative outcomes or may simply result in uncertainty. Therefore in order to increase the return, banks should know which risk factors have greater effect on profitability. Thus, this study examines the impact of financial risks on the profitability of commercial banks for a total of eight commercial banks in Ethiopia, covering the period of 2000-2011. To this end, the study adopts a mixed methods research approach by combining documentary analysis and in-depth interviews. The study reviews the financial records of eight commercial banks in Ethiopia and relevant data on macroeconomic factors considered. The findings of the study show that Credit risk and liquidity risk have a negative and statistically significant relationship with banks' profitability. However, the relationship for interest rate risk and foreign exchange rate risk is found to be statistically insignificant. The study suggests that focusing in credit risk management and keeping optimal level of liquidity which enables banks to meet their contractual commitments could maximize return on assets of Ethiopian commercial banks.

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List of Acronyms

AIB	Awash International Bank
BOA	Bank of Abyssinia
CAP	Capital
CBB	Construction and Business Bank
CBE	Commercial Bank of Ethiopia
CR	Credit risk
CLRM	Classical Linear Regression Model
DB	Dashen Bank
GDP	Gross Domestic Product
HP	Hypotheses
INFL	Inflation
LIQ	Liquidity risk
MoFED	Ministry of Finance and Economic Development
NBE	National Bank of Ethiopia
NIB	Nib International Bank
NIM	Net interest margin
OLS	Ordinary Least Square
ROA	Return on Asset
ROE	Return on Equity
RQ	Research Question
SSA	Sub Saharan Africa
UB	United Bank
WB	Wegagen Bank

Chapter 1 Introduction

Profitable and strong banking system promotes broader financial stability and increases the economy‟s resilience to adverse macroeconomic shocks. A healthy and sustainable profitability is important in maintaining the stability of the banking system and for sustainable economic growth in general (Tafri, et al., 2009).

The banking system in Ethiopia has witnessed a significant expansion following banking reform program which undertaken in 1994. The reform encouraged private banks to enter and expand their operations in the industry. Although such growth has taken place, as indicated in the National Bank of Ethiopia (NBE) 2010/11 annual report the banking system in Ethiopia is underdeveloped. Ethiopia is still one of the most under banked countries in the world with one bank branch serving over 82,000 people and the sector contributing little to GDP (NBE 2011). Ethiopian banks are characterized by operational inefficiency and insufficient competition (Lelissa (2007) and Abera (2012)). Thus these indicate the banking sector inefficiencies. As noted in Demirguc-Kunt and Huizinga (1999) Bank profitability can be seen as indicator of the (in) efficiency of the banking system. To improve banking sector efficiency it is therefore, worthwhile to identify the main factors which affect banks profitability.

Hence, identification and analysis of the determinants of bank profitability have attracted for many years the interest of academic researchers as well as bank management, supervisors and financial service participants. Both internal and external factors have been affecting the profitability of banks over time. And most studies in the literature find that internal bank characteristics explain a large proportion of banks profitability. Among others Shafiq & Nasr (2010), Achou and Tenguh (2008), Al-

Khouri (2011), Kithinji (2010), Baesens and Gestel (2009), found that internal bank characteristics such as risks explain a large proportion of banks profitability.

In the process of providing financial services, commercial banks assume various kinds of financial risks such as credit risk, liquidity risk, foreign exchange risk and interest rate risk which are related to the financial operation of a business and arise due to the uncertainty in movement of foreign exchange rates, interest rates, credit quality, and liquidity position (Bessis, 2002).

Coming back to the case of Ethiopia, Ethiopian commercial banks (ECBs) were also confronted with various kinds of financial risks, which may possibly intimidate the survival and success of the banks (NBE 2010).

In spite of this and the fact that banks are in the business of taking risk, it should be recognized that an institution need not engage in business in a manner that unnecessarily imposes risk upon it: nor it should absorb risk that can be transferred to other participants.

Thus examining the impact that the financial risks have on the profitability of the commercial banks in Ethiopia is essential for all banks as it enable them to manage those risks effectively. In order to increase the return, banks should know which risk factors have greater effect on profitability.

In light of the above, a lot of research work has so far taken place concerning the issue of determinants of bank profitability. Some earlier studies in the case of Ethiopian banks tried to identify factors contribute for the performance of the banks. However as the review of the literature presented in the second chapter indicated, the previous

studies conducted in Ethiopia in relation to this problem area do not incorporate specific risks in their models. Thus to the knowledge of the researcher, there appears to be very limited work on examining the impact of financial risks on profitability of banks. This topic is still relatively under-explored area in the banking literature in Ethiopia. So Conclusion about the impact of financial risks on the banks performance remains ambiguous.

Hence the intent of this study is to examine the impact level of financial risks (credit risk, liquidity risk, interest rate risk and foreign exchange rate risk) on profitability of commercial banks in Ethiopia.

The next part of this chapter of the study is structured in seven sections. In the first section statement of the problem is presented. The second section presents broad objective, hypotheses and research question. The research methodology is presented in third section and the subsequent two sections deal with significance of the study and scope of the study respectively. And section six presented limitation of the study. Lastly structure of the report is presented in the seventh section.

1.1. Statement of the problem

Commercial banks are exposed to different risks. In the process of providing financial services, they assume various kinds of financial risks (Santomero 1997). Without a doubt, in the present-day‟s unpredictable and explosive atmosphere all banks are in front of hefty risks like credit risk, liquidity risk, operational risk, market risk, foreign exchange risk, and interest rate risk, along with others risks, which may possibly intimidate the survival and success of the banks‟‟ (Akhtar et al. 2011, p.122)

Chapter 1 Introduction

Banking is a business mostly associated with risk because of its large exposure to uncertainty and huge considerations. Risk management is one of the most important practices to be used especially in banks, for getting assurance about the reliability of the operations and procedures being followed. An efficient risk management system is the need of time.

After the introduction of the reform in 1994 the banking industry in Ethiopia has experienced considerable changes such as entry of new banks in the industry which is expected to increase the competition among the commercial banks. The competition leads the banks to extend huge amounts of credit with the main objective of increasing profitability which may result in non-performing loans. For instance as the NBE‟s report presented during the review fiscal year 2009/10, deposit mobilized and outstanding loans of the banking system surged by 56.7 and 20.6 percent, respectively. The banking system disbursed fresh loans amounting to Birr 28.9 billion, 13.5 percent higher than last year, despite NBE‟s credit ceiling. Given lending restrictions imposed by the central bank during the fiscal year 2009/10, the increase in banks‟ lending was of course not as fast as the growth of deposits but still managed to rise by 21 percent (NBE2009/10).

With the recent development in the banking industry in Ethiopia, all banks are exposed to financial risks. Credit risk, operational risk and liquidity risk are dominant risks in Ethiopian banking industry. The volume of assets and liabilities carried by banks in Ethiopia that cannot be re-priced easily is increasing overtime thereby exposing banks to interest rate risk (NBE 2010).

Risk may have positive or negative outcomes or may simply result in uncertainty. Therefore, risks may be considered to be related to an opportunity or a loss or the presence of uncertainty for an organization. Every risk has its own characteristics that require particular management or analysis. Managing risk is one of the basic tasks to be done, once it has been identified. Risk management as commonly perceived does not mean minimizing risk; rather the goal of risk management is to optimize risk-reward tradeoff (Shafiq & Nasr 2010). Theoretically the tradeoff between risk and return is well acknowledged - the higher return comes with higher risk (Tafri, et al., 2009). Therefore in order to increase the return, banks should know which risk factors have greater effect on profitability.

To practice good risk management in the banks, it is necessary that an empirical study be conducted on evaluating the impact that these risks may have on profitability.

However, to the knowledge of the researcher, no study to date provides a comprehensive analysis of the impact of financial risks on profitability of commercial banks in Ethiopia. Therefore, the deficiencies of the previous studies to be discussed in the next chapter along with the above discussed issues call for the current research.

1.2. Broad objective, hypotheses and research question

The broad objective of this study is to examine the impact of financial risks on profitability of commercial banks in Ethiopia controlling the influence of some selected macro and bank specific variables.

Research question (RQ)

In line with the broad objective of this study described above, the following specific research question was formulated:

RQ1. Which financial risks mostly occur and affect the profitability of commercial banks in Ethiopia?

Hypotheses of the study

In line with the broad objective describe above, the following hypotheses were also formulated for investigation based on theories and past related empirical studies.

Hypothesis 1: Credit risk has significant negative impact on the profitability of the banks.

Hypothesis 2: Liquidity risk has significant negative impact on the profitability of the banks.

Hypothesis 3: Interest rate risk has a significant positive relationship with banks profitability

Hypothesis 4: foreign exchange rate risk has a significant negative relationship with banks' profitability

1.3. Research method used

In order to meet the objective of the study mixed methods approach was used. This method was adopted as it can provide stronger evidence. As noted in Creswell (2009) the use of mixed methods approach provides a better understanding of research problems. Considering the nature of the study, quantitative research approach was primarily applied. To have a better insight and to gain a richer understanding about the research problem, the quantitative method was supplemented with the qualitative one. The study covered eight commercial banks operated in Ethiopia for the twelve

years (2000-2011), the two government owned commercial banks Commercial Bank of Ethiopia (CBE) and Construction and Business Bank (CBB) and, the six private commercial banks in the country Awash International Bank (AIB), Bank of Abyssinia (BoA), Dashen Bank (DB), Nib International Bank (NIB), United Bank (UB) and Wegagen Bank (WB). Survey was carried out by means of structured document review. The data related to a documentary analysis which is necessary to undertake this study is gathered from the audited financial statements of the banks and NBE for twelve consecutive years (2000-2011) and for some controlled macroeconomic variables in this study the researcher used data taken from NBE and Ethiopian Ministry of Finance and Economic Development (MoFED). To supplement the data obtained through the structured document reviews in-depth interview was also conducted with the finance managers of the selected banks.

Thus, the results obtained from the above mentioned data source was analyzed using both descriptive as well as inferential statistics.

1.4. Significance of the study

This study helps to enhance local literatures on the subject matter. In addition, it also signifies commercial banks of the country to evaluate their risk management mechanisms in order to reduce loss and be profitable and more liquid than before. Beside to that it add knowledge for concerned bodies by identifying the impact level of financial risks towards profitability,,s of commercial banks of the country. Moreover, the researcher also believes that the study helps further researchers who are interested in this area as a reference.

1.5. Scope of the study

The scope of the study was restricted to all commercial banks that are registered by the NBE and operating in the Ethiopian banking industry and have at least twelve years data for the period 2000 to 2011. Therefore, the two publically owned banks (CBE and CBB), and six private commercial banks namely AIB, BOA, DB, NIB, UB and WB were included in this study.

1.6. Limitation of the study

Due to confidentiality policy of banks, the study limited to the officially disclosed financial data of banks and the personal perception of credit officers of selected Ethiopian commercial banks towards the issue.

The quantitative part of this study was mainly analyzed by the ordinary least square (OLS) method, which has basic assumptions to be tested (Brooks 2008). Therefore, diagnostic tests were performed to ensure the validity of the data and econometrics model. However, result of the autocorrelation test measured by the Durbin-Watson (DW) test statistics could not give support to the absence autocorrelation problem in this particular study. Hence this might impair the outcome of the study.

Moreover in this study the proxies used for most variables were expressed in terms of ratios. However ratio does not perfectly reveal the amount of its components and the quality of its components. Furthermore, there are a number of ratios in terms of measurement for individual variables. The ones which were selected in the model might possess certain bias as they cannot fully represent the accurate measurement for the tested variable. This is due to the data availability and the nature of ratio analysis.

1.7. Structure of the report

The research is organized as follows: Chapter one presents introduction of the study. Chapter two contains a review of the literature. The research design and methodology is presented in chapter three. Chapter four presents data presentation, analysis and interpretation of the results. Finally, chapter five presents conclusion and recommendations.

In this literature review part concepts related to profitability, financial risks, and their relationships and review of previous related studies which serve as background for this study and help to indentify knowledge gaps are presented. Hence, this chapter is arranged into three sections. Section 2.1 presents theoretical review of profitability and financial risks. This is followed by a review of the relevant empirical studies which are related with this study presented in section 2.2. Finally conclusion and identification of knowledge gap are presented in section2.3.

2.1. Theoretical review

This section of the chapter presents theoretical review related to financial risks, commercial banks profitability and its measurement and the relation between financial risks and profitability. Accordingly, section 2.1.1 presents different financial risks in banking. Then section 2.1.2 presents banks profitability and its measurement. Finally section 2.1.3 presents the relation between financial risks and profitability.

2.1.1. Financial risks in banking

Financial risks associated with the provision of banking services are risks related to the financial operation of a business, such as credit risk, liquidity risk, interest rate risk and currency risk. Then the following subsections discuss these risks in an orderly.

2.1.1.1. Credit risk

This is the uncertainty attached with the collection of loans. The probability that some banks asset value, especially its loans will decline and perhaps became worthless is known as credit risk. None performing loan is a loan that is not earning income and

full payment of principal and interest is no longer anticipated, the maturity date has passed and payment in full has not been made.

The real risk from credit is the deviation of portfolio performance from its expected value. Accordingly, credit risk is diversifiable, but difficult to eliminate completely. This is because a portion of the default risk may, in fact, result from the systematic risk. In addition, the idiosyncratic nature of some portion of these losses remains a problem for creditors in spite of the beneficial effect of diversification on total uncertainty. This is particularly true for banks that lend in local markets and ones that take on highly illiquid assets. In such cases, the credit risk is not easily transferred, and accurate estimates of loss are difficult to obtain (Santomero, 1997).

Credit risk indicator can be represented by different measurements including loans loss provision to total loans ratio as well as growth in bank deposits. Higher provisions for loan losses could signal the likelihood of possible future loan losses, though it could also indicate a timely recognition of weak loans by prudent banks. The ratio of non-performing loans to total loans and loses is one of the most widely used indicators of bank credit risk. In most countries central banks set some specific standards for the level of loan-loss provisions to be adopted by the country‟s banking system. In view of these standards, bank management should adjust provisions held for loan losses portfolio, and in most studies credit risk are modeled as a predetermined variable.

Credit risk measurement system attempts to quantify the risk of losses due to counterparty default. Credit risk management encompasses identification, measurement, matching mitigations, monitoring and control of the credit risk exposures to ensure that:

- The individuals who take or manage risks clearly understand it
- The organization‟s Risk exposure is within the limits established by Board of Directors with respect to sector, group and country‟s prevailing situation
- Risk taking Decisions are in line with the business strategy and objectives set by BOD
- The expected payoffs compensate the risks taken
- Risk taking decisions are explicit and clear
- Sufficient capital as a buffer is available to take risk (Motlagh, et al.,2011, p.5)

The basis for an effective credit risk management process is the identification and analysis of existing and potential risks inherent in any product or activity. Consequently, it is important that banks identify the credit risk inherent in all the products they offer and the activities in which they engage. This is particularly true for those products and activities that are new to the bank where risk may be less obvious and which may require more analysis than traditional credit-granting activities. Although such activities may require tailored procedures and controls, the basic principles of credit risk management will still apply. All new products and activities should receive board approval before being offered by the bank.

The goal of credit risk management is to maintain a bank‟s credit risk exposure within parameters set by the board of directors and senior management. The establishment and enforcement of internal controls, operating limits and other practices will help ensure that credit risk exposures do not exceed levels acceptable to the individual bank. Such a system will enable bank management to monitor adherence to the established credit risk objectives.

Experiences elsewhere in the world suggest that the key risk in a bank has been credit risk. Indeed, failure to collect loans granted to customers has been the major factor behind the collapse of many banks around the world. Credit risk is not confined to a bank‟s loan portfolio, but can also exist in its other assets and activities. Likewise, such risk can exist in both a bank‟s on-balance sheet and its off-balance sheet accounts (NBE, 2010).

2.1.1.2. **Liquidity Risk**

Liquidity risk is the potential for loss to an institution arising from either its inability to meet its obligations or to fund increases in assets as they fall due without incurring unacceptable cost or losses. This risk is one of the risks a bank faces. According to the definition of the Basel Committee on Banking Supervision (1997), liquidity risk arises from the inability of a bank to accommodate decreases in liabilities or to fund increases in assets. When a bank has inadequate liquidity, it cannot obtain sufficient funds, either by increasing liabilities or by converting assets promptly, at a reasonable cost, thereby affecting profitability.

This risk results from the inability of the bank to repay liabilities and obligations due on their maturity dates because the bank does not harmonize the maturities dates of assets and liabilities through investment in assets with maturities dates greater than those of liabilities, something which leads to the inability to meet the demands for the withdrawal of deposits when they are due (Blume, 1971 cited in Claudiu and Daniela, 2009). Liquidity risk can be divided into two types: Funding Liquidity Risk (it results from the inability of the bank in normal circumstances to obtain adequate liquidity to repay its obligations, or obtain new deposits or a new loan or its inability to liquidate

its assets); Market Liquidity Risk (it results from sudden withdrawal of deposits resulting in the inability of the bank to pay without incurring unexpected loss) (Claudiu and Daniela, 2009). The concept of liquidity is increasingly important in managing financial risk. It is driven by; the structure and depth of markets; volatility of market prices/rates; the presence of traders willing to make markets and commit capital to support trading; and, trading / leverage strategies deployed. It has historically been thought of as associated with funding, however, it can be separated into two distinct risk types Funding Liquidity Risk and Trading Liquidity Risk.

In any case, risk management here centers on liquidity facilities and portfolio structure. Recognizing liquidity risk leads the bank to recognize liquidity itself as an asset, and portfolio design in the face of illiquidity concerns as a challenge (Santomero, 1997).

Banks provide maturity transformation. Taking deposits that are callable on demand or that on average has shorter maturity than the average maturity of the financing contracts they sell. While maturity transformation provides liquidity insurance to the depositors, which is valued by them, it exposes banks to liquidity risk themselves. Since banks specialize in maturity transformation they take pool deposits and take care to match their cash inflows and outflows in order to address the liquidity risk they face.

However, maturity mismatch at a given time is not the only source of liquidity risk. The risk of this kind can arrive from many directions and its pinch depends on various factors. Its sources; on assets side depend on the degree of inability of bank to convert

its assets into cash without loss at time of need, and on liabilities side it emanates from unanticipated recall of deposits.

Determining what is adequate liquidity for banking organizations has always been a rather subjective and difficult task, because banks rarely have liquidity problems as long as they are viewed as sound and deposit inflows are positive. Failure to properly manage liquidity can quickly result in significant unanticipated losses. The purpose of liquidity management is to ensure that every bank is able to meet fully its contractual commitments. The ability to fund increases in assets and meet obligations as they come due is critical to the ongoing viability of any bank. Therefore, managing liquidity is among the most important activities conducted by banks. Sound liquidity management can reduce the probability of serious problems. Since a bank‟s future liquidity position will be affected by factors that cannot always be forecasted with precision, assumptions need to be reviewed frequently to determine their continuing validity. These assumptions should be made under the different categories of assets, liabilities and off-balance sheet activities (NBE, 2010).

The bank‟s intermediation activity is characterized by the acceptance of short-term deposits (demand and term deposits) and the granting of medium and long term loans. They must be prepared to meet their withdrawals of deposits at any moment of time. In order to do so, banks hold two types of reserves: required reserves, imposed by the central bank; and excess reserves, demanded by precautionary reasons. Holding reserves entails an opportunity cost but it represents an insurance against liquidity risk.

2.1.1.3. Interest Rate Risk:

Interest rate risk arises from movements in interest rates. A bank is exposed to interest rate risk when it experiences a situation of imbalance in terms of size or maturity dates between assets and liabilities sensitive to interest rates, leading to potential losses for the bank when interest rate increases or declines and this influences the net asset value in the budget, which some call risk gap (Claudiu and Daniela, 2009)

In the scenario of rising interest rate, when liabilities re-price faster than assets, interest spread would fall and hence profitability of the bank would be adversely affected. Accepting this risk is a normal part of banking business and can be an important source of profitability. However, excessive interest rate risk can pose a significant threat to banks' earnings and capital base. Changes in interest rates affect banks' earnings by changing their net interest income and the level of other interest-sensitive income and operating expenses. Companies face interest-rate risks from the interest-rate sensitivity of their debts and/or their investments. However, for non-financial services companies, the risks from interest-rate sensitivity of their debts would usually outweigh the risks from their investments. The impact of interest rates on the business will depend on the choice of funding: the mix between capital and debt; the mix between fixed and floating rate debt; and the mix between short-term and long-term debt.

There are a number of factors that need to be considered when deciding whether to use fixed-rate or floating-rate instruments:

- The expectation of future interest-rate movements. If interest rates were expected to fall, a floating rate would be more attractive to a borrower.

- The term of the loan or investment. Interest-rate changes would be easier to predict in the short-term than in the long-term.
- Differences between the fixed rate and the floating rate.
- The company‟s goals, risk management strategy and risk appetite.
- Current levels of debt and the current interest-rate exposure. A mix of fixed and floating-rate instruments ensures diversification of interest rate exposure and acts as a natural hedge (Collier 2009).

Fluctuations in interest rates may affect different companies in different ways but almost every company is affected by changes in interest rates.

A company that borrows or invests surplus funds does so at either a fixed rate of interest or at a floating (variable) rate. Fixed rates provide certainty as interest payments or receipts are known regardless of future interest-rate movements. However, there are also risks associated with fixed-rate debts. For long-term debts the company risks being locked in to a high interest rate if interest rates fall during the life of the loan. A floating-rate borrowing (or investment) varies through the life of the loan (or investment). Floating rates are usually expressed as a margin over an agreed reference rate and are reset at regular intervals.

Literature indicates three main methodologies for interest rates risk management: difference (gap) analysis, duration analysis, duration-difference analysis.

Difference (Gap) Analysis includes the analysis of all bank balance items according to possible reappraisal dates and its sensitivity for interest rate shift. Reappraisal date is the date when corresponding financial instrument may change the interest rate and thus influence the bank profit receivable from interest.

Another very important factor while conducting the difference analysis is evaluating bank‚s assets and liabilities sensitivity to the interest rate shifts. Not all the assets and liabilities are sensitive to interest rate shifts. In difference analysis only assets and liabilities that are sensitive to interest rate shifts, i.e. the instruments whose prices will change if the interest rate will vary in the market, are used. Firstly all the assets and liabilities delivering no interest must be excluded. Calculated positive gap means that more assets would be reappraised comparing with liabilities at the given period. Negative gap means that at the given moment more liabilities will be reappraised comparing to the assets. Consequently, after the increase of interest rate, interest outcomes will grow more than interest incomes, i.e., when the interest rate increases, net income received from the interest will decline. If the interest rate declines, net income from the interest will grow (Martirosianien, 2008).

Duration Analysis helps to evaluate the interest rate risk more simply but more mathematical calculations must be done. One dimension, describing the financial measure, which could be used in order to evaluate the riskiness of this measure in the case of interest rate fluctuations, is calculated.

Duration is a dimension describing the financial measure value sensitivity to interest rate shifts and may be considered as mean measure lifetime, while evaluating money flows it has created weighted by a time. The theory of duration calculation was developed by Macauley in 1938 and it may be described as follows: The core of Duration-Difference Analysis is calculations of duration discrepancies for bank‚s assets and liabilities, i.e. evaluation of duration of money flows created by all assets and duration of money flows created by all liabilities. The difference between assets and liabilities durations help to evaluate the bank riskiness from the interest rate risk

view and to explain which course of interest rate shift would be useful for the bank and which would be harmful (Mark et al., 2011).

The compatibility (and/ or controlled incompatibility) of bank assets and liabilities terms and interest rates are crucial factors in bank management. In practice it is not common that banks would completely match the terms of assets and liabilities, because there are many different type and duration transactions taking place in the bank very often. Incompatible position potentially increases the profitability, but also disguises the risk of possible loss. The terms of assets and liabilities and the possibility to change interest expenditures in acceptable price when its term arrives are crucial factors while evaluating bank,,s liquidity and facing risk, related with the fluctuations of interest rates and currency exchange rates. Some banks manage interest rate risk by analyzing, forecasting interest rates in the market and managing asset-liabilities discrepancies according to reappraisal terms (Martirosianien, 2008).

The goal of interest rate risk management is to maintain a bank's interest rate risk exposure within self-imposed parameters over a range of possible changes in interest rates. As expressed in Basel Committee on Banking Supervision (2003), a system of interest rate risk limits and risk taking guidelines provides the means for achieving that goal. Such a system should set boundaries for the level of interest rate risk for the bank and where appropriate, should also provide the capability to allocate limits to individual portfolios, activities or business units. Limit systems should also ensure that positions that exceed certain predetermined levels receive prompt management attention. An appropriate limit system should enable management to control interest rate risk exposures, initiate discussion about opportunities and risks and monitor actual risk taking against predetermined risk tolerances. Limits should be consistent

with overall approach to measuring interest rate risk. Aggregate interest rate risk limits clearly articulating the amount of interest rate risk acceptable to the bank should be approved by the board of directors and re-evaluated periodically. Such limits should be appropriate to the size, complexity and capital adequacy of the bank as well as its ability to measure and manage risk.

2.1.1.4. Foreign exchange rate risk

Exchange rates tell us how many units of one currency may be bought or sold for one unit of another currency. The spot rate is the exchange price for transactions for immediate delivery. The forward rate applies to a deal which is agreed upon now but where the actual exchange of currency is not due to take place until some future date. The exchange of currencies at the future date will be at the rate agreed upon now.

Bessis (2010) defines foreign exchange risk as incurring losses due to changes in exchange rates. Such loss of earnings may occur due to a mismatch between the value of assets and that of capital and liabilities denominated in foreign currencies or a mismatch between foreign receivables and foreign payables that are expressed in domestic currency.

Currency volatility is a major risk faced by companies doing business outside their home countries. There are a number of factors that influence a currency‟s exchange rate:

- Speculation. Speculators enter into foreign exchange transactions not because they have a need for the currency but with a view to profit from their expectations of the currency‟s future movements. If speculators expect a

currency to devalue, they will short sell the currency with the hope of buying it back cheaply in the future.

- Balance of payments. The net effect of importing and exporting will result in a demand for or a supply of the country‟s currency.
- Government policy. Governments from time to time may wish to change the value of their currency. This can be achieved directly by devaluation, revaluation or through the use of foreign exchange markets.
- Interest-rate differentials. A higher rate of interest can create a demand for a particular currency. Investors will buy that currency in order to hold financial securities in the currency with the higher interest rate.
- Inflation rate differentials. Where countries have different inflation rates the value of one country‟s currency is falling in real terms in comparison with the other. This will result in a change in the exchange rate.

Exchange rate risk occurs as a result of either transaction risk or economic risk. Transaction risk occurs from the effect of changes in nominal exchange rates that affect a company‟s contractual cash flows in foreign currencies. It relates to contracts already entered into but which have yet to be settled. Thus, a company is subject to transaction risk whenever it imports goods from or export goods to another country which are paid at a later date, or where a company borrows or invests in a foreign currency or uses derivatives denominated in a foreign currency (Collier 2009).

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.

This uncertain movement poses a threat to the earnings and capital of bank, if such a movement is in undesired and unanticipated direction.

Unhedged position in a particular currency gives rise to foreign currency risk and such a position is said to be Open Position in that particular currency. If a bank has sold more foreign currency than he has purchased, it is said to be Net Short in that currency, and the alternative is Net Long position when sold less than purchased. Both of these positions exposed to risk as the foreign currency may fall in value as compared to local or home currency and becomes a reason for substantial loss for the bank if it is in Net Long position or the foreign currency may rise in value and cause losses if the bank is Net Short in that currency. Net Foreign Currency Exposure which is the sum of these two positions gives the information about the Foreign Exchange Risk that has been assumed by the bank at that point of time. This figure represents the unhedged position of bank in all the foreign currencies. A negative figure shows Net Short Position whereas positive figure shows Net Open Position (Sounder and Cornet 2007).

2.1.1.5. Off-Balance Sheet Risks

As part of their operations, banks get involved in originating financial contracts that may result in the acquisition of assets and liabilities at some future date, under certain conditions. Generally accepted accounting principles do not consider these contracts in themselves to be assets or liabilities and therefore do not recognize them on the face of the balance sheet but rather off balance sheet. Off Balance sheet items are diverse in nature and purpose and may include letters of credit (L/C), unused loan commitments, guarantees, acceptances and performance bonds.

Off-Balance sheet business to banks means exposure to several risks. The bank must have basic understanding of the risks associated with off-balance sheet business which, in principle, are not different from on-balance sheet business and should in fact be regarded as an integral part of the bank's overall risk profile. The major risks associated with off balance sheet business are summarized below:

Off balance sheet activities can either reduce or increase exposure to exchange rate changes. In managing foreign exchange risk, banks must constantly monitor their foreign exchange positions whether arising from off or on balance sheet business.

Off balance sheet activities have an impact on interest rate risk exposure, entered into as a hedge against on balance sheet interest rate exposure. Furthermore, some individual transactions may be undertaken to increase net interest rate exposures. In such cases, this may lead to an increase in interest rate as well as credit risk. Interest rate risk measurement and control calls for banks to perform sensitivity analyses so that management can estimate the effect of a given change in interest rates.

Liquidity risk is risk that a bank shall not be able to obtain the necessary funds to meet its obligations as they fall due e.g., maturing deposits, drawings under approved facilities. The bank may therefore be unable to obtain funds from the market at competitive rates which may convey wrong signals that the bank is facing serious problems.

Credit risk is risk that one or more counterparties might fail to perform on- of off-balance sheet obligation e.g., guarantees, non-cash covered L/Cs. Banks run the risk of losses arising from failure to apply adequate control mechanisms regarding off balance sheet items.

In order to explain the relationship of bank profitability and the above discussed financial risks first it is necessary to discuss banks profitability and its measurement. Then the following section presents the theoretical explanation related to Banks profitability and its measurement.

2.1.2. Banks profitability and its measurement

Commercial banks make profit by earning more money than what they pay for expenses and taxes. The most important portion of a bank's profit comes from the fees that it charges for its services and the interest that it earns on its assets. Its major expense is the interest paid on its liabilities. Loans dominate asset holding at most banks and generate the largest share of operating income. Loans are the dominant asset in most banks‟ portfolios, comprising from 50 to 70 percent of total assets (Claudiu and Daniela (2009).

The major assets of a bank are its loans to individuals, businesses, and other organizations and the securities that it holds, while its major liabilities are its deposits and the money that it borrows, either from other banks or by selling commercial paper in the money market. Return on asset (ROA) and return on equity (ROE) are the commonly used ratios to measure profitability of a business. Assets are used by businesses to generate income. Loans and securities are a bank's assets and are used to provide most of a bank's income. However, to make loans and to buy securities, a bank must have money, which comes primarily from the bank's owners in the form of bank capital, from depositors, and from money that it borrows from other banks or by selling debt securities. A bank buys assets primarily with funds obtained from its liabilities. However, not all assets can be used to earn income, because banks must have cash to satisfy cash withdrawal requests of customers.

The ROA is determined by the amount of fees that it earns on its services and its net interest income.Net interest income depends partly on the interest rate spread, which is the average interest rate earned on it assets minus the average interest rate paid on its liabilities. Net interest margin shows how well the bank is earning income on its assets.

High net interest income and margin indicates a well managed bank and also indicates future profitability.

The measurement of bank performance has been developed over time. At the beginning, many banks used a purely accounting-driven approach and focused on the measurement of Net income, for example, the calculation of ROA. However, this approach does not consider the risks related to the referred assets, for instance, the underling risks of the transactions, and also with the growth of off-balance sheet activities. Thus the riskiness of underlying assets becomes more and more important. Gradually, the banks notice that equity has become the scarce resource. Thereby, banks turn to focus on the ROE to measure the net profit to the book equity in order to find out the most profitable business and to do the investment (Gerhard .S 2002 cited in Ara et al., 2008). Net interest margin (NIM) ratio is also used to measure bank profitability in the baking literature. Studies that explore the factors that influence the profitability of banks use one or a combination of these ratios alternatively as measures of bank profitability in their analysis.

Ratios (net profit to total asset, net profit to equity, and NIM) instead of the real value of profits are used in measuring bank profitability because ratios are not influenced by variations in the general price level. Ratios are time invariant, the real value of profits

may be affected by the time varying inflation rates. That is, ratios are time invariant because both the numerator and the denominator in the period-t would be measured in monetary terms based on period-t price levels (Guru et al., 1999)

2.1.3. The Relationship between financial risks and profitability

Risks are usually defined by the adverse impact on profitability of several distinct sources of uncertainty. It is also commonplace to argue that the expected return on an asset should be positively related to its risk. That is, individuals will hold a risky asset only if its expected return compensates for its risk. Both the Capital asset pricing model (CAPM) developed in the early 1960s and Arbitrage pricing theory (APT) imply a positive relationship between expected return and risk. Even, the APT views risk more generally than just the standardized covariance or beta of a security with the market portfolio. The relevant risk of an individual stock, which is called its beta coefficient, is defined under the CAPM as the amount of risk that the stock contributes to the market portfolio. And the CAPM states that the expected returns on stocks should be related only to beta, which represents Market risk or systematic risk; it is the risk that remains after diversification. Standard asset pricing models also imply that arbitrage should ensure that riskier assets are remunerated with higher returns.

The basic concepts of the CAPM were developed specifically for common stocks, and fundamental assumptions for the positive risk-return trade off are that investors are risk averse, and thus investors demand compensation for bearing risk, Any investor can lend and borrow an unlimited amount at the risk free rate of interest, There are no taxes or transaction costs, and All investors have access to the same information at the

same time. However, In reality, every investor has a credit limit, and Real financial products are subject both to taxes and transaction costs, and taking these into account will alter the CAPM's trade-off assumption of higher risk for higher return.

An alternative to the CAPM, called the arbitrage pricing theory (APT), has been developed more recently. The differences between the two models stem from the APT‟s treatment of interrelationship among the returns on securities. The APT assumes that returns on securities are generated by a number of industry wide and market wide factors. Correlation between a pair of securities occurs when these two securities are affected by the same factor or factors. By contrast, though the CAPM allows correlation among securities, it does not specify the underlying factors causing the correlation (Wang et al., 2012).

CAPM is widely used by analysts, investors, and corporations. However, despite the CAPM‟s intuitive appeal, a number of studies have raised concerns about its validity. In particular, a study by Fama and French doubt on the CAPM. Fama and French (1992) found two variables that are consistently related to stock returns: (1) the firm‟s size and (2) its market/book ratio. After adjusting for other factors, they found that smaller firms have provided relatively high returns, and that returns are relatively high on stocks with low market/book ratios. At the same time, and contrary to the CAPM, they found no relationship between a stock‟s beta and its return (Jaffe 2003).

The main source of revenue or main sources of profit of banks came from lending money to their customers. Which means Risk-taking is an inherent element of banking and, indeed, profits are in part the reward for successful risk taking. In contrary, excessive, poorly managed risk can lead to distresses and failures of banks.

The prime reason to adopt risk management practices is to avoid the probable failure in future. But, in realistic terms, risk management is clearly not free of cost. In fact, it is expensive in both resources and in institutional disruption. But the cost of delaying or avoiding proper risk management can lead to some adverse results, like failure of a bank and possibly failure of a banking system (Meyer, 2000).

The following section presents reviews of the prior empirical studies conducted in relation to financial risks and profitability of commercial banks.

2.2. Empirical review

There are prior studies conducted in different countries which are related to the topic/problem of this study. In order to show the research gap and justify the importance of this study the following section presents review of the empirical evidence that have examined financial risks and profitability of commercial banks.

A study made by Tafri et al. (2011) examined the relationship between financial risks (credit risk, interest rate risk and liquidity risks.) and profitability of the conventional and Islamic banks in Malaysia for the period between 1996 and 2005. They used panel data regression analysis of Generalized Least Squares of fixed effects and random effects models and found that credit risk has a significant impact on profitability of the conventional as well as the Islamic banks. The relationship between interest rate risk and ROE were found to be weakly significant for the conventional banks and insignificant for the Islamic banks. The effect of interest rate risk on ROA is significant for the conventional banks. And also they found liquidity risk to have an insignificant impact on profitability.

Imad et al. (2011) examined that the credit risk is associated with significant inverse relationship with profitability in Jordan, thus, increased exposure to credit risk in Jordanian banking sector lowers profits.

Akhtar et al. (2011) studied factors influencing the profitability of Conventional Banks of Pakistan. They intend to study the bank-specific determinants of conventional banks in Pakistan to highlight and identify the significant factors that are influencing on bank‟s profitability. They reported none performing loans ratio is found to have negative and significant effect on the profitability of commercial banks.

Olweny & Shipho (2011) examined the effects of banking sector factors on the profitability of commercial banks in Kenya. They adopted an explanatory approach by using panel data research design. Annual financial statements of 38 Kenyan commercial banks from 2002 to 2008 were obtained were used for the analysis purpose. The data was analyzed using multiple linear regressions method. The results of the analysis showed that all the bank specific factors had a statistically significant impact on profitability, while none of the market factors had a significant impact.

Al-Khouri (2011) also investigated the impact of bank‟s specific risk characteristics, and the overall banking environment on the performance of 43commercial banks operating in the 6 of the Gulf Cooperation Council (GCC) countries over the period 1998-2008 by using fixed effect regression analysis. The results showed that credit risk, liquidity risk and capital risk are the major risk factors that affect bank performance when profitability is measured by return on assets and the only risk that affected the profitability as measured by return on equity is the liquidity risk.

Gachua (2011) study the effect of foreign exchange exposure on a Firm‟s financial performance of listed Companies in Kenya for the period covering years 2001 to 2010. The study is to find out whether foreign exchange exposure is minimized where firms have been able to match their foreign currency revenues and costs leaving them with little net exposure. From the findings the study found that listed firms use the income statement and the owner„s equity account to record foreign exchange differences. The study concluded that unrealized foreign exchange gains/losses had an effect on the Net Income of listed companies as it was posted to either income statement or owners‟ equity. The study also found that there had been significant percentage growth in imports and exports for firms listed in the Nairobi Stock Exchange. The study further concluded that the use of foreign exchange has an effect on import costs and accounts payables, export revenues and accounts receivables with the net effect on the Net Income of the companies.

On the other hand Kithinji (2010) determined the relationship between the credit risk management and profitability of commercial banks in Kenya and the findings reveal that the bulk of the profits of commercial banks is not influenced by the amount of credit and nonperforming loans suggesting that other variables other than credit and nonperforming loans impact on profits. Commercial banks that are keen on making high profits should concentrate on other factors other than focusing more on amount of credit and nonperforming loans.

Bordeleau and Graham (2010) studied the impact of liquidity on bank profitability. They present empirical evidence regarding the relationship between liquid asset holdings and profitability for a panel Canadian and U.S. banks over the period of 1997 to 2009. The result suggest that a nonlinear relationship exists, whereby

profitability is improved for banks that hold some liquid assets, however, there is a point beyond which holding further liquid assets diminishes a banks‟ profitability, all else equal.

Valentina et al. (2009) measure credit risk using the ratio of loans to deposits and short-term funding since this provide a forward-looking measure of bank exposure to default and asset quality deterioration. Given that the portfolio of outstanding loans is non tradable, credit risk is modeled as a predetermined variable in their specification. Based on standard asset pricing arguments, they expect a positive association between profits and bank risk and found that credit risk has a positive and significant effect on profitability. This suggests that risk-averse shareholders target risk adjusted returns and seek larger earnings to compensate higher credit risk.

Shen et al. (2009) carried out a study on twelve advanced economies commercial banks over the period 1994-2006 with the title Bank liquidity risk and performance. The study investigates the causes of liquidity risk and the relationship between bank liquidity risk and performance for those banks with the specified period and they find that liquidity risk is the endogenous determinant of bank performance. The causes of liquidity risk include components of liquid assets and dependence on external funding, supervisory and regulatory factors and macroeconomic factors.

Ara et al. (2009) studied Credit Risk Management and Profitability of Commercial Banks in Sweden using the quantitative method. They try to find out how the credit risk management affects the profitability in banks. The main purpose of this study is to describe the impact level of credit risk management on profitability in four commercial banks in Sweden. They took four banks to study this area and data is

collected from the sample banks annual reports (2000-2008) and capital adequacy and risk management reports (2007-2008) and used multiple regression models to do the empirical analysis. The findings of the analysis reveal that credit risk management has effect on profitability in all four banks. Among the two credit risk management indicators, NPLR has a significant effect than CAR on profitability (ROE). The analysis on each bank level shows that the impact of credit risk management on profitability is not the same. The researchers obtained that there is a reasonable effect of credit Risk Management on profitability of those banks.

Shamsuddin (2009) conducted a study with the topic Interest rate and foreign exchange risk exposures of Australian Banks. This study estimates systematic risk exposure of publicly listed Australian banks with respect to market, interest rate and foreign exchange rate using a GARCH-in-Mean model. Not surprisingly, the results suggest that nearly all banks exhibit varying degrees of market risk exposure. However, stock returns of large banks are highly sensitive to interest rate changes, while most small banks are almost immune to both interest and exchange rate changes.

Delport and Li (2009) also conduct study with the purpose of evaluating the effect of exchange rates movement on fourteen listed Chinese banks‟ equity returns, by using the Arbitrage Pricing Theory Model. In particular, this study analyses the three foreign currencies holding the largest trading position with China, namely the Euro, US Dollar, and Japanese Yen. This empirical study finds that Chinese banks are on average most sensitive to exchange-rate movements with regards to Japanese yen.

Achou and Tenguh (2008) examined the relationship between bank performance and credit risk management This study shows that there is a significant relationship between bank performance (in terms of profitability) and credit risk management (in terms of loan performance). Better credit risk management results in better bank performance. Their study also reveals that banks with good or sound credit risk management policies have lower loan default ratios (bad loans) and higher interest income (profitability) and also banks with higher profit potentials can better absorb credit losses whenever they crop up and therefore record better performances. Furthermore, the study shows that there is a direct but inverse relationship between profitability (ROE, ROA) and the ratio of non-performing loans to capital (NPL\C).

Li (2007) carried out a study which aimed to identify the main internal determinants of banks profitability and to what extent these determinants exert impact on banks profitability. This study investigates the impact bank‟s specific factors and macroeconomic factors on bank‟s profitability, which is measured by return on average assets (ROAA) in the UK banking industry over the period 1999-2006 with aim to indicate the strengthen of risk management in banks. The results show that the impact of loan loss reserves has a negative impact on profit and statistically significant. This implies that higher credit risks result in lower profits. The result for liquidity is mixed and not significant, indicates that conclusion about the impact of liquidity remains questionable and further research is needed.

Pasiouras & Kosmidou (2007) examined the effects of internal and external variables on profitability, including the capital ratio, cost to income ratio, loans to customers and short-term funding, bank size, inflation, GDP growth, concentration, and three determinants reflecting the development of banking and stock markets on bank

returns for 584 domestic and foreign commercial banks in the 15 developed European Union countries over the period 1995-2001. The effects of all variables are found to be significant, regardless of bank.

Hedging allows the commercial banks to manage foreign exchange risk but hedging itself poses additional risk to bank. Gandhi (2006) mentioned that currency derivatives like currency futures, currency forwards, currency swaps and currency options help in hedging foreign exchange risk of firms and other ways of hedging including off-setting positions against the underlying assets and money markets are themselves risky. Hedging and hedging right are two different things. If the hedging is not done properly in the right way, it itself can become a serious source of risk and have potential to pose a serious financial loss to the firm.

Athanasoglou et al. (2005) examined Bank-specific, Industry specific and macroeconomic determinants of bank Profitability, bank of Greece and as expected, credit risk is negatively and significantly related to bank profitability. This shows that in the Greek banking system managers, attempting to maximize profits, seem to have adopted a risk-averse strategy, mainly through policies that improve screening and monitoring credit risk.

Zhang and Epperson (2004) conducted their paper on “Profitability and risk of U.S. agricultural banks” The researcher believed that Study of profitability and risk of agricultural banks is very important in assessing the ability to adequately finance agricultural production and rural development. A recursive system of profitability and risk equations is estimated to compare the performance of agricultural with nonagricultural banks and to identify factors which affect performance. A linear

regression model which measures risk-adjusted profitability confirms the results from the recursive system. The finding of the researcher was agricultural banks perform better than nonagricultural counterparts on average even after controlling for risks and other factors. Further, off-balance-sheet business is found to be negatively related to the risk-adjusted profitability of agricultural banks**.**

Popov and Stutzmann (2003) investigated how two Swiss companies manage their foreign exchange risk and examined that forward and netting are the most used instruments and transaction exposure is the most managed foreign exchange risk. And translation and economic exposures are not well identified and managed mainly because firms believe it is unnecessary or too complex. And also they observed that firms hedge their exposure but never fully due to high cost of hedging.

In Ethiopia also there are prior studies conducted which are related to the topic/problem of this study.

A study was conducted by Abera (2012) with the topic factors affecting profitability of commercial banks in Ethiopia. He examined the bank-specific, industry-specific and macro-economic factors affecting bank profitability for a total of eight commercial banks in Ethiopia, covering the period of 2000-2011 Using a mixed methods research approach and found that capital strength, income diversification, bank size and gross domestic product have statistically significant positive relationship with banks‟ profitability and variables like operational efficiency and asset quality have a negative and statistically significant relationship with banks‟ profitability. And also the relationship for liquidity risk measured with a ratio of

liquid assets to total assets, concentration and inflation is found to be statistically insignificant.

Tesfaye (2012) conducted a study with the intent of examining Determinants of banks liquidity and their impact on financial performance of commercial banks in Ethiopia. She used balanced fixed effect panel regression for the data of eight commercial banks in the sample covered the period from 2000 to 2011. She selected and analyzed eight factors affecting banks liquidity. Then after identifying determinants of commercial banks liquidity in Ethiopia she tried to see the impact of banks liquidity up on financial performance through the significant variables explaining liquidity and then among the statistically significant factors affecting banks liquidity capital adequacy and bank size had positive impact on financial performance whereas, non-performing loans and short term interest rate had negative impact on financial performance. Interest rate margin and inflation had negative but statistically insignificant impact on financial performance. And she concluded as the impact of bank liquidity on financial performance was non-linear/positive and negative.

Tefera (2011) studied Credit risk management and profitability of Commercial Banks in Ethiopia. He used nonperforming loan ratio and capital adequacy ratio as a proxy for credit risk and the result showed that both proxies has a negative impact on profitability of commercial banks in Ethiopia.

Kapur and Gualu (2011) investigated the impact of macroeconomic factors, financial system, banking sector variables and bank-specific characteristics on Ethiopian commercial banks‟ profits measured using return on assets (ROA) measure of profit.

They examined that nonperforming loans and advances to the total loans and advances ratio (NPL) has negative and significant impact on Ethiopian banks profit.

Damena (2011) conducted study with the title "Determinants of commercial banks profitability: empirical study on Ethiopian Commercial Banks", with the aim to examine the impact of bank-specific, industry-specific and macroeconomic determinants of Ethiopian commercial banks profitability applying the balanced panel data of seven Ethiopian commercial banks that covers the period 2001- 2010. This study showed that all bank-specific determinants, with the exception of saving deposit, significantly affect commercial banks profitability in Ethiopia. He examined as credit risk is the main significant factor which challenges the profitability of banks in Ethiopia.

NBE, 2009, Results of banking sector risk management survey suggests existence of some positive steps taken so far by banks to strengthen their risk management practices. The survey revealed that credit, operational and liquidity risks have been dominant risks over the last two years, and will continue to be key risks over the next five years.

2.3. Conclusion and knowledge gaps

In order to measure the impact level of financial risks (like credit risk, liquidity risk and market risks; interest rate risk and foreign exchange rate risk) on profitability of commercial banks it necessitates study in each country since we cannot describe the impact level from the scratch or simple from the theory. The review of the literature discussed in this chapter reveals the existence of many gaps of knowledge in this

regard, particularly in the context of Ethiopia. To my knowledge the above mentioned issue has not been adequately investigated in Ethiopia.

Although a very limited number of studies such as Kapur and Gualu (2011), Damena (2011), and Abera (2012), conducted in Ethiopia appear to include credit risk as explanatory variables for commercial banks profitability, this relationship is not the focus of those papers and credit risk is generally included as a control variable in these studies with very limited discussion around the estimated parameter. Abera (2011) also included liquidity as explanatory variable for commercial banks profitability and found its impact insignificant and point to a need for further investigation in this regard. The study conducted by Tefera (2011) also tried to examine only the impact of credit risk on profitability of commercial banks in Ethiopia using quantitative methods.

The recent study of Tesfaye (2012) mainly assessed the determinants of Ethiopian commercial banks liquidity risk. Then after identifying determinants of liquidity, the impact of banks liquidity up on financial performance is examined through the significant variables explaining liquidity such as short term interest rate, non-performing loans, capital adequacy and bank size. However liquidity risk is not directly used in this study; instead factors affecting it significantly are used.

Therefore information about the impact of financial risks on the banks performance remains ambiguous. This study therefore, is an attempt to address this gap of information on Ethiopian commercial banking sector. Then, the intent in this study is to measure the impact level of financial risks on profitability of commercial banks in Ethiopia using mixed method approach.

The preceding chapter presented the review of the existing literature on the financial risks of banks and factors affecting the profitability of banks and identified the knowledge gap. This chapter presents the methodology used in order to address the research questions and hypotheses and hence achieve the broad objective

The chapter is organized in three sections. Section 3.1 presents the research hypotheses with the description of variables used in the study and research questions. Section 3.2 discusses the research approaches while section 3.3 presents the methods adopted in the study including the data collection tools and methods of data analysis.

3.1. Variables selection, hypotheses and research questions

As already shown in the first chapter, the broad objective of this study is examining the impact of financial risks on profitability of commercial banks in Ethiopia controlling the influence of some selected macro and bank specific variables.

To achieve these objectives, testable hypothesis and research questions were developed. The following subsections present the dependent variable and the independent variables with testable hypotheses.

3.1.1. Dependent Variables

The dependent variable in this study is profitability. Theoretically the measures of profitability are Return on Equity (ROE) and Return on Assets (ROA) while a measure of spread is the Net interest/income margin (NIM). For this study, the measure of profitability employed is return on assets (ROA) which reflects the ability of a bank‟s management to generate profit from the bank‟s assets and is defined as the ratio of net income to average of total assets. ROA is used as the key proxy for bank

profitability, instead of the alternative return on equity (ROE), because an analysis of ROE disregards financial leverage and the risks associated with it. And also ROA is a more comprehensive measure of profitability and, second, it is widely used in the literature, which allows comparison with previous studies in Ethiopia or other countries.

3.1.2. Independent Variables and hypotheses

Following the work of prior studies which are related to this study such as Li 2007, Tafri et al.(2009), Ramlall 2009, Bordeleau and Graham (2010), Al-Khouri, 2011, and many others researchers work this section presents the independent variables that are used in the econometric model to estimate the dependent variable. The independent variables credit risk, liquidity risk, interest rate risk and foreign exchange rate risk have been selected on the basis of their potential relevancy to this model.

Credit Risk:

The ratio of non-performing loans to total loans is used to proxy the credit risk. The higher the ratio the poorer the quality and therefore the higher the risk of the loan portfolio will be. An implication of asset pricing models (e.g., the capital asset pricing model (CAPM) of Sharpe (1964) and Lintner (1965)) is the positive relationship between the risk premium on all invested wealth and the variance of its return. It implies a positive relation between risk and expected return. These asset pricing theories propose this hypothesis taking assumptions as described in the literature. On the other hand, most empirical studies found that credit risk negatively affected the profitability of commercial banks. This may be due to the practicality of

the assumptions and stock return volatility might not be used as risk measure in the studies.

Recent empirical studies examined that increased exposure to credit risk is normally associated with decreased firm profitability. Miller and Noulas (1997) point out that credit risk should unleash a negative impact on profitability since the higher the level of high-risk loans, the higher the level of unpaid loans. And also Tafri et al.(2009), Ara (2009), Kithinji (2010), Tefera (2011) Al-Khouri, (2011),among others found a negative relationship between profitability and credit risk. Hence, credit risk is expected to have a negative relationship with banks profitability.

Hypothesis 1: Credit risk has significant negative impact on the profitability of the banks.

Liquidity risk:

As Golin (2001) mentions it is critical that a bank guard carefully against liquidity risk; the risk that it will not have sufficient current assets such as cash and quickly saleable securities to satisfy current obligations e.g. those of depositors especially during times of economic stress. Without the required liquidity and funding to meet obligations, a bank may fail. However, liquid assets are usually associated with lower rates of return. The higher this percentage the more liquid the bank is and less vulnerable to a classic run on the bank. Ramlall, (2009), also noted as low levels of liquidity constitute the main causes of bank failure. The proxy for liquidity risk that is to be used in this study is the ratio of liquid assets to deposits and short term borrowings. The expected relationship with profitability is negative.

Hypothesis 2: Liquidity risk has significant negative impact on the profitability of the banks.

Interest rate risk:

Another important financial risk which can affect performance of commercial banks is interest rate risk. Faure (2002 cited in Williamson 2008, p.15) recognizes that banks can theoretically avoid interest rate risk by perfectly matching assets and liabilities "in terms of currency [term to maturity], and have the rates on both sides fixed or floating, and thus enjoy a fixed margin." If a positive sloping (or normal) yield curve is assumed, an ideal portfolio can be constructed for both a falling and rising interest rate environment. During falling interest rates, the most beneficial portfolio would be to have all liabilities short with floating rates and assets long with fixed rates (and vice versa for a rising interest rate environment).

A large portion of commercial banks" revenue stems from net interest income that is generated from the difference between various assets and liabilities that are held in the balance sheet. The bank's position in relation to interest rates sensitivity can be measured in several ways. One of the methods is the ratio between the interest sensitive assets and the interest sensitive liabilities. A ratio of interest sensitive assets to interest sensitive liabilities equal to 1 shows a balanced position. The proxy for interest rate risk used is the ratio of maturity gap (Rate Sensitive Assets less Rate Sensitive Liabilities) to total capital.

Tafri et al. (2009) found that the effect of interest rate risk on profitability (ROA) of Malaysian Commercial is positive. Following this prior research in the present study,

the interest rate risk is predicted to have a positive relationship as the profitability is expected to increase with a positive increase in interest rate risk exposure.

Hypothesis 3: Interest rate risk has a significant positive relationship with banks profitability

Foreign Exchange rate risk:

Fourthly, the researcher anticipated that foreign exchange rate risk may have a relation with the commercial banks‟ profitability in Ethiopia.

Foreign exchange risk arises from open or imperfectly hedged positions in a particular currency. These positions may arise as a natural consequence of business operations, rather than from any conscious desire to take a trading position in a currency. Exchange rate fluctuations might affect the overall performance of banks through foreign currency transactions and operations (Sounder and Cornet, 2007).

Exchange rate volatility gives information about the foreign exchange risk that has been assumed by the bank (Demerguc-Kunt & Huizinga 1999). In this study, foreign exchange rate risk would be measured by the exchange rate volatility. Exchange rate volatility for each year is calculated as the standard deviation of the percentage change in the real US dollar exchange rate for the three preceding years. To measure exchange rate volatility this study uses inter-bank foreign market rate at period weighted average.

Papaioannou (2006) pointed out that the risk of changes in foreign exchange rates affect a firm‟s stock returns, profitability and cash flows. Foreign currency exposure and risk management is very important for the firm to avoid any vulnerability from

exchange rates fluctuation which can affect the profits and assets values in a negative way.

In a similar study on Canadian banks (Atindehou & Gueyie, 2001), it is found out for the Canadian Banks that stock prices responded positively with depreciation of foreign currencies. The exchange rate volatility affect a firm‟s competitive position on its home market and as a consequence its profitability (Popov & Stutzmann, 2003). Hence, basing the above discussion hypothesis relating to foreign exchange risk is developed as follows:

Hypothesis 4: Foreign exchange rate risk has a significant negative relationship with banks profitability

Controlled Variables

In order to isolate the effects of risk factors on performance, it is needed to control for other factors that are expected to have some influence on profitability. The control variables which are expected to influence bank‟s profitability are:

Bank size: The size of the bank is also included as an independent variable. As noted in Kapur and gualu (2011) inclusion of this independent variable helps to account for size related economies (scale economies with reduced costs, or scope economies that result in loan and product diversification, thus providing access to markets that a small bank cannot entry) and diseconomies of scale. The banks that enjoy economies of scale incur a lower cost of gathering and processing information resulting in high financial flexibility and ultimately high spreads (Afzal, 2011). This means bigger banks can have lower costs per unit of income and therefore higher net interest

margin. Similarly, banks with larger branch network can penetrate deposit markets and mobilize savings at a lower cost.

Size is used to capture the fact that larger banks are better placed than smaller banks in harnessing economies of scale in transactions to the plain effect that they will tend to enjoy a higher level of profits. Size of the bank is being measured using yearend natural log of total assets. Most empirical studies reviewed find size to be positively related to profitability. Consequently, a positive relationship is expected between size and profits.

Bank capital: it is measured by the ratio of equity capital to total asset. Well capitalized banks have higher net interest margins and are more profitable. Banks with higher capital ratios tend to face lower cost of funding as they need to borrow less. Thus we can say that they are less exposed to liquidity risk, so the higher the ratio the lower the liquidity risk exposure of the banks (Tafri et al. 2009). Bank capital is expected to have a positive relationship with profitability. Among others, Tafri et al. (2009), and Li (2007), found that capital is positively related with profitability. In this proposed study Bank capital is expected to have a positive relationship with profitability.

GDP Growth: The macroeconomics variable that is used to control for the effect of the economic environment on banks‟ profitability is growth. Economic growth is measured by the real GDP growth and it is expected to have a positive impact on the profitability according to the literature on the association between economic growth and financial sector performance.

Inflation: annual growth rate for inflation is also used as an explanatory variable in model of this study. 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 might increase bank cost and have a negative effect on profitability if banks are unable to adjust accordingly (Flamini et al. (2009).

Previous researches documented mixed result positive relationship between inflation and bank profitability in Ethiopian commercial banks. Kapur and Gualu (2011) and Damena (2011) indicated positive association of inflation and profitability and Abera (2012) found negative association of inflation and profitability of commercial banks in Ethiopia. Thus, the expected sign of the inflation is unpredictable based on prior researches.

In addition, the following research question is developed by the researcher in order to achieving the research objective qualitatively as far as mixed method approach is used in this particular study.

Research Question

RQ1. Which financial risks mostly occur and affect the profitability of commercial banks in Ethiopia?

The next table summarizes the above specified dependent and independent variables of the study with their respective notation, measurement and expected signs.

Table 3.1 Descriptions of the variables and their expected relationship

	Variables	Measure	Notation	Expected Sign
Dependant variable	Profitability	Net income/total assets	ROA	NA
Independent variables	Credit risk	Non-performing loans/total loans	CR	-
	Liquidity risk	Liquid assets/ deposits and borrowings	LIQ	-
	Interest rate risk	Rate sensitive Assets-Rate sensitive liabilities/total capital	IRR	+
	Foreign exchange rate risk	Exchange rate Volatility	FORX	-
	Capital	Equity / total Asset	CAP	+
	Bank Size	Natural log Total Asset	SIZE	+
	Growth	GDP growth	GDP	+
	Inflation	The annual inflation rate	INFL	?

3.2. Research approaches

A research approach can be either qualitative or quantitative or mixed. Critical decision should be made which design to be used for specific topic. The selection of

appropriate research approach helps a researcher to plan and implement the study in a way that will help to obtain the intended results. On the basis of the research problem, the researcher should decide which research approach is going to lead him/her easily, swiftly and most efficiently to the most reliable findings that adequately answer the research questions (Devetak, et al. 2010). The following discussions presents the basic features of the three research approaches.

A quantitative approach is one in which the investigator primarily uses postpositive claims for developing knowledge effect thinking, reduction to specific variables and hypotheses and questions, use of measurement and observation, and the test of theories, employs strategies of inquiry such as experiments and surveys, and collect data on predetermined instruments that yield statistics data. This approach is based on the numerical observations and aims at generalizing a phenomenon through formalized analysis of selected data (Creswell, 2003). Quantitative research design provides precise, quantitative, numerical data and allows for statistical comparison between various groups (Johnson and Onwuegbuzie, 2004). But quantitative research design has also some limitations. The researcher may miss out on phenomena occurring because of the focus on theory or hypothesis testing rather than on theory or hypothesis generation (called the confirmation bias). Knowledge produced may be too abstract and general for direct application to specific local situations, contexts, and individuals (Johnson and Onwuegbuzie, 2004).

The second approach is qualitative approach and it is characterized by more of description instead of numerical data and aim to create a common understanding of the subject being studied. Qualitative methods provide a depth of understanding of issues that is not possible through the use of quantitative, statistically based

investigations. In this approach data is gathered more in a verbal and visual than in a numeric form. The researcher collects open-ended, emerging data with the primary intent of developing themes from the data. A major strength of the qualitative approach is the depth in which explorations are conducted and descriptions are written, usually resulting in sufficient details for the reader to grasp the idiosyncrasies of the situation. The ultimate aim of qualitative research is to offer a perspective of a situation and to provide well written research reports that reflect the researcher's ability to illustrate or describe the corresponding phenomenon (Devetak, et al. 2010). Qualitative approach is useful for describing complex phenomena (Johnson and Onwuegbuzie, 2004). However, knowledge produced may not generalize to other people or other settings (i.e., findings may be unique to the relatively few people included in the research study). It is difficult to make quantitative predictions and it is more difficult to test hypotheses and theories, it may have lower credibility with some administrators and commissioners of programs due to the impression that the results are more easily influenced by the researcher‟s personal biases.

The third approach is mixed methods research approach which involves philosophical assumptions, the use of qualitative and quantitative approaches, and the mixing of both approaches in a study. This research design is useful to capture the best of both quantitative and qualitative approaches (Creswell, 2003, p. 24). The combined use of quantitative and qualitative methods has a number of benefits. Quantitative research may complement qualitative research and benefit the production of knowledge. Numbers can be use to add precision to words and narrative and words, pictures, and narrative can be used to add meaning to numbers so can provide stronger evidence. Therefore this method answers a broader and more complete range of research

questions because the researcher is not confined to a single method or approach (Johnson and Onwuegbuzie 2004). The following section hence presents the method assumed for this study.

3.3. Research methods adopted

A mixed methods design is useful to capture the best of both quantitative and qualitative approaches (Creswell, 2003). This method can provide stronger evidence. Also as noted in Creswell (2009) the use of quantitative and qualitative approaches in combination provides a better understanding of research problems than either approach alone. Therefore considering this advantage and taking into consideration the research problem and objective described earlier mixed research approach is found to be appropriate for this study. Hence, the following sections present consecutively the quantitative and qualitative aspects of the research method.

3.3.1. Research method: quantitative aspect

The quantitative aspect of the research method aimed to obtain data needed to explain the relationship between financial risks and the profitability of commercial banks in Ethiopia. Hence, survey design (structured review of documents) is applied for this study. A survey design provides a quantitative or numeric description of trends, attitudes, or opinions of a population by studying a sample of that population. From sample results, the researcher generalizes or makes claims about the population Creswell (2003, p. 153). In this rationale, consider the advantages of survey designs, such as the economy of the design and the rapid turnaround in data collection, survey was carried out by means of structured document review. The data related to a documentary analysis which is necessary to undertake this study was gathered from the audited financial statements of the banks and NBE for twelve consecutive years

(2000-2011) and for some controlled macroeconomic variables in this study the researcher used data taken from NBE and Ethiopian Ministry of Finance and Economic Development (MoFED).

Sampling design

The population of the study is all commercial banks registered by NBE. There are 18 banks operating in the Ethiopian banking sectors. In this study, two criteria are used to determine the study sample. The first criterion is the nature of the bank. In the study, only commercial banks registered by NBE and under operation in the country currently are included. The main reason to include only commercial banks is to ensure that the econometric estimations are robust; it is preferable to work on a homogeneous sample. Availability of data is the second criteria, to this the study consider only banks that have data for the years 2000 to 2011. Therefore, based on the above two criterion only eight banks were included in the study from the total banks operating in the Ethiopian banking sectors. The eight commercial banks included in the study are, Awash International Bank (AIB), Bank of Abyssinia, commercial bank of ethiopia (CBE), Construction and Business Bank (CBB), Dashen Bank (DB), Nib International Bank (NIB), United Bank (UB), Wegagen Bank (WB) .

Data analyzing methods

To identify and measure the impact level of financial risks on banks profitability, the study was done primarily based on panel data, which was collected through structured document review. In this study, a panel data set which was employed comprises of 8 banks for which the same variables is collected annually for twelve years. Thus this pooled data contains a total of 96 observations. Panel data is preferred because of its many advantages over either cross-section or time series data. As noted in Brook

(2008) it is possible to 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 and it is often of interest to examine how variables, or the relationships between them, change dynamically (over time). To do this using pure time-series data would often require a long run of data simply to get a sufficient number of observations to be able to conduct any meaningful hypothesis tests. But by combining cross-sectional and time series data, one can increase the number of degrees of freedom, and thus the power of the test, by employing information on the dynamic behavior of a large number of entities at the same time. Also as noted in Baltagi (2005) the advantage of using panel data is that it controls for individual heterogeneity, less collinearity among variables and tracks trends in the data something which simple time-series and cross-sectional data cannot provide.

Thus, the collected panel data was analyzed using descriptive statistics, correlations matrix and multiple linear regression analysis. The descriptive statistics was used to quantitatively describe the important features of the variables and to analyze the general trends of the data from 2000 to 2011 based on the sector sample of 8 banks using statistical results mean, maximum minimum and standard deviations. In addition, the correlation analysis was conducted to identify the degree of association between the independent and explanatory variables. The correlation analysis shows only the degree of association between variables and does not permit the researcher to make causal inferences regarding the relationship between variables. However regression is more flexible and more powerful than correlation and permits making causal inferences regarding the relationship between variables (Brooks 2008).

Therefore, in order to test the hypothesis of this study and to determine the relative importance of each independent variable in influencing profitability of the commercial banks in Ethiopia multiple linear regression analysis was done. Accordingly, a two step multiple linear regression equations were run. In the first step (general) regression equation, all the proposed independent variables (i.e., CR, LIQ, IRR, FORX, SIZE, CAP, INFL and GDP) were regressed with respect to the dependent variable (ROA). Whereas, in the second step only the significant variables that were found from the first step regression equation were regressed to investigate there effect on ROA of Ethiopian commercial banks. The multiple linear regressions model was conducted by the ordinary listing square (OLS) method.

The researcher does not develop a new model instead specifies a model with some improvement following the work of Akhtar et al. (2011), Al-Khouri (2011), Imad et al. (2011), Bordeleau and Graham (2010), Kithinji (2010), Ramlall (2009), Ara et al. (2009), Tafri et al. (2009), and Li (2007).

The basic linear equation for the model is as follows:

$Y_{it} = \alpha + \beta_i X_{it} + \mu_{it}$

Where Y_{it} = a dependant variable which represents bank profitability

- X_{it} = a vector of financial risks and a set of macroeconomic variables reflecting the state of the economy and bank specific variables which have an impact on profitability.
- μ_{it} = the residual term to reflect all other market imperfections and regulatory restrictions affecting profitability.

- α_i , i = 1,..., N, are constant coefficients specific to each bank
- i =1,…, N, is the i th cross-sectional unit and t =1,..., T, is the tth time period,

In the light of the above model and on the base of selected variables the current study used econometric model which is specified as follows:

PROFITABILITY = F (RISKS, BANK, MACRO)

RISK represents the four financial risks of the banks namely credit risk, liquidity risk, interest rate risk and foreign exchange rate risk while MACRO and BANK are the control variables which denotes a set of macroeconomic variables reflecting the state of the economy and bank specific variables respectively.

Specifically the model is:

$ROA_{it} = \beta_0 + \beta_1 CR_{it} + \beta_2 IRR_{it} + \beta_3 LIQ_{it} + \beta_4 FORX_{it+} \beta_5 SIZE_{it} + \beta_6 CAP_{it} + \beta_7 GDP_{it} + \beta_8 INFL_{it} + \mu_{it}$

Where

ROA_{it} = Return on Assets of bank i for year t

CR_{it} = Credit Risk of bank i for year t

IRR_{it}= Interest Rate Risk of bank i for year t

LIQ_{it} = Liquidity risk of bank i for year t

$FORX_{it}$ = Foreign exchange rate risk of bank i for year t

$SIZE_{it}$= Log of Total Assets of bank i for year t

CAP_{it}= Bank Capitalization of bank i for year t

GDP_t = GDP Growth Rate for year t

$INFL_{it}$ = Inflation growth rate for year t

B_i = Coefficients of the variables

μ_{it} = Error term

The regression analysis is done using Econometric/statistical software package[1] Eviews[2] 6 software.

There are basic assumptions of Classical Linear Regression Model (CLRM) and if the assumptions hold true, then the estimators determined by OLS will have a number of desirable properties, and are known as Best Linear Unbiased Estimators(Brooks 2008). Therefore, diagnostic tests are performed to ensure whether the assumptions of the CLRM are violated or not in the model. Thus, the following section discussed the CLRM assumptions and performed diagnostic tests.

Test for Heteroscedasticity: as indicated in Brooks (2008), and Gujirati, 2004 the assumption of homoscedasticity is that the variance of the errors is constant. If the errors do not have a constant variance, they are said to be heteroscedastic. In order to test the presence of heteroscedasticity the popular white test[3] was used.

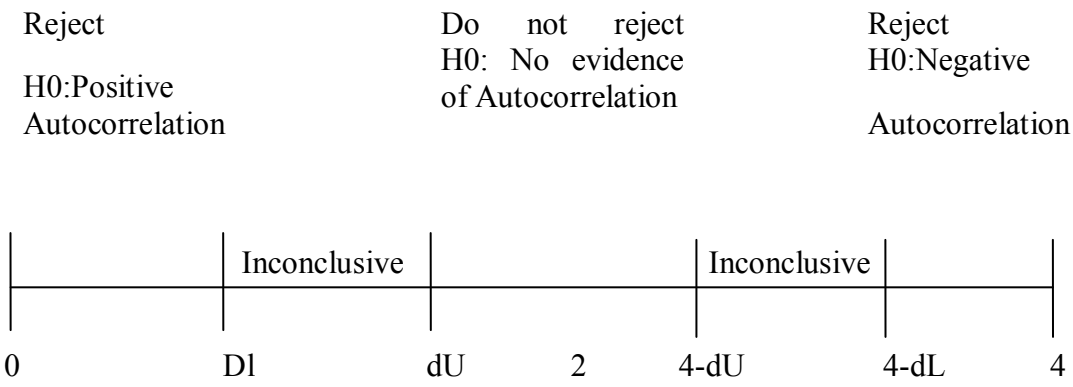
[1] There are a number of Econometric software packages for modeling financial data. EViews, GAUSS, LIMDEP, MATLAB, RATS, SAS, SHAZAM, SPLUS, SPSS, TSP are a set of widely used packages for modeling financial data (Brook 2008).

[2] This software is preferred as the researcher is more familiar with it.

[3] This test involves testing the null hypothesis that the variance of the errors is constant (homoscedacticity) or no heteroscedasticity versus the alternative that the errors do not have a constant variance.

Test for Autocorrelation: It is assumed that the errors are not correlated with one another. If the errors are correlated with one another, it would be stated that they are „serially correlated" (Brooks 2008). As noted in Brooks (2008), DW has 2 critical values: an upper critical value (dU) and a lower critical value (dL), and there is also an intermediate region where the null hypothesis of no autocorrelation can neither be rejected nor not rejected. The rejection, non-rejection, and inconclusive regions are shown on the number line in figure 3.1 bellow.

Figure 3.1: Rejection and Non-Rejection Regions for DW Test



Test for normality: This assumption requires the disturbances to be normally distributed. Bera-Jarqu normality test which is the most commonly used normality test was conducted. If the residuals are normally distributed, the histogram should be bell-shaped and the Bera-Jarque statistic would not be significant at 5% significant level (Brooks 2008).

Test for Multicollinearity: This assumption is concerned with the relationship exist between explanatory variables. An implicit assumption that is made when using the OLS estimation method is that the explanatory variables are not correlated with one another (Brooks2008). On the other hand, multicollinearity means that there is linear

relationship between explanatory variables which may cause the regression model biased (Gujarati, 2004). Thus a correlation matrix of the selected explanatory variables was used to test multicollinearity. As stated by Hair et al. (2006) correlation coefficient below 0.9 may not cause serious multicollinearity problem. Kennedy (2008) also suggests that any correlation coefficient above 0.7 could cause a serious multicollinearity problem leading to inefficient estimation and less reliable results. Besides the variance of inflation factor (VIF)[4] method was used to test the existence of this problem. If the results show that the variance of inflation factor VIF is more than 10, the regression results affected by a multicollinearity problem (Gujarati 2004).

3.3.2 Research method: Qualitative aspect

In this study, to gather the qualitative data needed for addressing some of the research questions, interviews and document analysis was employed.

In-depth interview is the primary data collection technique for gathering data in qualitative approach. The research demands data gathering through unstructured interviews and deep analysis and interpretation of them, to derive the underlying methods of handling risks. The interview was conducted with six Ethiopian commercial banks Officers/managers of finance and risk management departments. The interviewees were from both private and state owned banks namely Construction and Business Bank, Commercial Bank of Ethiopia, Awash international bank, Dashen bank, United bank and Bank of Abyssinia. The respondents contacted once and each respondent was contacted at different times. As a result, the response of the

[4] The variance analysis is done using SPSS 16.0 Software package.

interviewees" for the interview questions was used for supporting the result obtained from analysis of structured record reviews.

Finally, links between research question/hypotheses and variables on the one hand and different data sources on the other hand are presented in table 3.2 below.

Table 3.2 Link between research question/hypotheses, variables and the different data sources

Research questions and hypotheses	Data sources
RQ1. Which financial risks mostly occur and affect the profitability of commercial banks in Ethiopia?	In-depth unstructured face-to-face interviews with Ethiopian commercial banks finance managers
HP1: Credit risk has significant negative impact on the profitability of the banks.	Bank-specific data from Income statement and Balance sheet held by NBE and the banks
HP2: Liquidity risk has significant negative impact on the profitability of the banks.	
HP3: Interest rate risk has a significant positive relationship with banks profitability	
HP4: foreign exchange rate risk has a significant negative relationship with banks' profitability	

Controlled variables and their expected relationships with the dependant variable	
HP5: *There is a significant positive relationship between the amount of capital of a bank and the banks' profitability.*	Bank-specific data from Income statement and Balance sheet held by NBE and the banks
HP6: There is a significant positive relationship between the size of a bank and profitability.	
HP7: There is a significant positive relationship between real gross domestic product growth and bank profitability	Bank-specific data from Income statement and Balance sheet held by NBE and the banks and macroeconomic data from the records held by NBE and MOFED
HP8: There is a significant positive/negative relationship between inflation and bank profitability	

In summary, this chapter presented the basic features of qualitative, quantitative and mixed methods research approaches and the features of the methods selected for this study with the justifications. The subsequent chapter discusses the results and analysis

The previous chapter presents the research methodology adopted in the study. The purpose of this chapter is to present and discuss results of data obtained from different methods involved in this study. Therefore, the chapter is organized into three sections. The first section 4.1 presents research hypotheses and questions as presented in the previous chapter. This is followed by the results of both documentary analyses (structured review of documents) and in-depth interviews in section 4.2. Finally, Section 4.3 discusses the results of the study.

4.1. Research Questions and Hypotheses

As stated in chapter one the broad objective of this study is examining the impact of financial risk (credit risk, liquidity risk, interest rate risk and foreign exchange rate risk) on the profitability of Ethiopian commercial banks. So as to achieve this broad objective the following four hypotheses and one specific research question were formulated:

Hypothesis 1: Credit risk has significant negative impact on the profitability of banks.

Hypothesis 2: Liquidity risk has significant negative impact on the profitability of t banks.

Hypothesis 3: Interest rate risk has a significant positive relationship with banks profitability

Hypothesis 4: foreign exchange rate risk has a significant negative relationship with banks' profitability

In addition to the above hypotheses, the following specific research question was also formulated:

RQ1. Which financial risks mostly occur and affect the profitability of commercial banks in Ethiopia?

4.2. Results

The purpose of this section is to present the results of data obtained from different methods involved in this study. Therefore, the results of the documentary analysis (structured reviews of financial records) and in depth interviews are presented in the following subsections.

4.2.1. Documentary analysis (structured review of financial records)

As mentioned earlier, quantitative research approach along with survey design (structured review of financial records) was primarily used. The necessary data gathered from the documents held by NBE, MoFED and the banks were analyzed using descriptive statistics, correlation matrix and multiple linear regression analysis. Therefore, the following subsections present the results of the documentary analysis as follows. Section 4.2.1.1 presents results of the descriptive statistics followed by the correlation analysis among the dependent and independent variables in section 4.2.1.2. Section 4.2.1.3 presents tests for the classical linear regression model assumptions. Finally, the outcomes of the panel data regression analysis are presented in section 4.2.1.4.

4.2.1.1. Descriptive statistics

Table 4.1 presents the outcomes of the descriptive statistics for main variables involved in the econometrics model of this study. The total number of observation for each variable was 96 (i.e., data for 8 banks for the period from the year 2000 to 2012). Key figures, including mean, median, standard deviation, minimum and maximum value were reported. This was generated to give overall description about data used in the model and served as data screening tool to spot unreasonable figure.

Table 4.1: Summary of descriptive statistics for dependent and independent variables

Variables	Observations	Mean	Median	Max	Min	Std. Dev.
ROA	96	0.032	0.035	0.057	0.006	0.012
CR	96	0.133	0.087	0.535	0.000	0.118
LIQ	96	0.506	0.483	1.115	0.273	0.144
IRR	96	-0.900	-0.580	3.955	-8.668	1.934
FORX	96	3.63	3.71	9.34	0.21	3.011
SIZE	96	21.797	21.679	25.462	18.778	1.365
GDP	96	0.086	0.108	0.126	-0.021	0.045
CAP	96	0.116	0.110	0.294	0.037	0.048
INFL	96	0.107	0.090	0.364	-0.106	0.118

Note: Return on asset (ROA), Credit risk (CR), Liquidity risk (LIQ), Interest rate risk (IRR), foreign exchange rate risk (FORX), Size (SIZE), Capital (CAP), Inflation (INFL) and Growth domestic product (GDP)
Source: Financial statements of banks, MoFED reports and own computation

As can be seen from table 4.1, for the total sample, the mean of ROA was 3.2% with a minimum of 0.6% and a maximum of 5.7%. This indicated that, Ethiopian commercial banks that were considered in this study were earned an average of 3.2

cents of profit before tax for a single birr invested in their assets. More specifically, the most profitable bank among the sampled banks earned 5.7 cents of profit before tax for a single birr invested in the assets of the bank. On the other hand, the least profitable bank of the sampled banks earned 0.6 cents of profit before tax for each birr invested in the assets of the bank. The standard deviation statistics for ROA was 0.012 which indicates that the profitability variation between the selected banks was very small.

Regarding the independent variables of the model there are some interesting statistics that have to be mentioned. For instance, the descriptive statistic of exchange rate risk which was measured by exchange rate volatility has shown the highest standard deviation (3.011). The result indicates the existence of relatively higher volatility of Ethiopian birr in exchange with U.S dollar for the period under consideration. The size of banks which was measured by natural log of total asset also revealed the highest standard deviation (1.365). This indicates the existence of high variation among ECBs in terms of their size. On the other hand, the mean value of interest rate risk which was measured by ratio of the gap between rate sensitive assets and rate sensitive liabilities capital was -0.90 with a minimum of -8.67and a maximum of 3.95. This implies that, on average, Ethiopian commercial banks had been liability sensitive over the period under consideration.

Another interesting observation was the equity-to-asset ratio of banks which indicated by the range between 29.4% and 3.7%. The average equity-to-asset ratio of banks was 11.6%, which was considerably above the statutory requirement of 8% set by NBE based on Basel II recommendation. The standard deviation statistics was 0.048 which shows the existence of relatively higher variation of equity

to asset ratio between the selected banks compared to the variation in ROA. On the other hand, the outputs of the descriptive statistics indicate that, the average ratio of liquid assets to deposits and liabilities was 50.6%, with a minimum of 27.3% and a maximum of 111.5%. This means despite the inverse relationship that exists between liquidity and profitability, the liquidity measure indicates that the Ethiopian commercial banks have, on average, a higher liquidity position which was somewhat higher than the statutory requirement of 20% for the last twelve years.

In addition, the mean of CR (measured by the ratio of nonperforming loans to total loans) was 13.3% with a minimum of 0.86 % and a maximum of 53.5%. This indicates that, from the total loans that ECBs disbursed, an average of 13.3% were being default or uncollected over the sample period. The disparity between the minimum 0.86 % and the maximum 53.5% of NPLs indicate the margin that CR ratio of ECBs ranged over the sample period. The standard deviation (0.118) of CR also shows the existence of high variation among ECBs in terms their loan recovering capacity as compared to other variables like ROA. On the other hand, the mean real GDP growth in Ethiopia for the last twelve years was 0.086 (8.6%), with a maximum of 12.6% and a minimum of -2.1 %. The standard deviation was 0.045; this implies that economic growth in Ethiopia during the period of 2000 to 2011 remains reasonable stable and the result was more or less in agreement with the government‟s report regarding economic growth. The other macro-economic variable employed in this study was INFL, had somewhat a higher standard deviation (0.118) compared to GDP; this implies that inflation rate in Ethiopia during the study period remains somewhat unstable.

4.2.1.2. Correlation analysis

As mentioned in the third chapter, the purpose of correlation matrix in this particular study was to show the linear association between the dependent and independent variables.

As can be seen in table 4.2, credit risk (CR) is the most negatively correlated variable and significantly correlated at 1 percent significance level with the movement of bank‟s profitability (ROA) with a correlation coefficient of -0.669. Moreover IRR (Interest rate risk (interest rate change exposure)) had shown insignificant negative correlation with the movement of bank‟s profitability with a correlation coefficient of -0.101. Those correlation results clearly indicate the existence of inverse linear association among the above mentioned variables and ROA of Ethiopian banks. In other words, as CR and IRR increases, bank‟s profitability moves to the opposite direction. The magnitude of the correlation coefficient for credit risk was the highest of all the variables used in this study implying the existence of strong inverse linear association among CR and ROA.

However, the liquidity of banks and foreign exchange risk measured by exchange rate volatility had shown insignificant positive correlation with the movement of bank‟s profitability with a correlation coefficient of 0.149 and 0.164 respectively. This implies that, as these variables increase, profitability of Ethiopian commercial banks also moves towards the same direction. The direct linear association among the liquidity of banks and ROA was surprise. However, the association was not significant and strong since the magnitude of the correlation coefficient was small as compared to other variables like CR and the controlled variable GDP.

Moreover, as shown in the correlation matrix all control variables are significantly correlated with return on asset. Bank size, capital (equity to asset ratio), real GDP growth and inflation had shown a positive linear association with the movement of bank"s profitability with a correlation coefficient of 0.316, 0.261, 0.608 and 0.410 respectively. This implies that, as the abovementioned variables increase, profitability of Ethiopian commercial banks also moves towards the same direction. The magnitude of the correlation coefficient for real GDP growth (0.608) and inflation rate (0.410) had shown a strong positive linear association with the movement of ROA as compared to other variables. On the other hand, the correlation coefficient of interest rate risk was the least of all the variables used in this study indicating the existence of slight linear association with the movement of ROA.

Table 4.2 Correlation matrix of dependent and independent variables

Correlation Probability	ROA	CR	LIQ	IRR	FORX	CAP	SIZE	GDP	INFL
ROA	1								

CR	-0.668	1							
	0.000	-----							
LIQ	0.149	-0.174	1						
	0.148	0.089	-----						
IRR	-0.101	-0.054	-0.210	1					
	0.335	0.600	0.040	-----					
FORX	0.164	-0.147	0.221	-0.254	1				
	0.111	0.154	0.030	0.013	-----				
CAP	0.261	-0.399	0.304	0.396	0.140	1			
	0.010	0.001	0.003	0.000	0.168	-----			
SIZE	0.316	-0.019	0.112	-0.766	0.142	-0.546	1		
	0.002	0.854	0.280	0.000	0.168	0.000	-----		
GDP	0.608	-0.450	0.156	-0.151	-0.119	-0.080	0.369	1	
	0.000	0.000	0.128	0.142	0.247	0.442	0.000	-----	
INFL	0.410	-0.359	0.253	-0.183	-0.117	-0.041	0.392	0.383	1
	0.000	0.000	0.013	0.075	0.256	0.695	0.000	0.000	-----

Source: Financial statements of banks, MoFED reports and own computation

As noted in Brooks (2008), regression is more flexible and more powerful than correlation and permits making causal inferences regarding the relationship between variables. In order to show the casual relationships among dependent variable (ROA) and independent variables regression analysis were conducted in this study. Accordingly, test results for the classical linear regression model (CLRM) assumptions and the regression results are presented and discussed in the following sub sections.

4.2.1.3. Test results for the classical linear regression model assumptions

In this study as mentioned in chapter three diagnostic tests were carried out to ensure that the data fits the basic assumptions of classical linear regression model. Consequently, the results for model misspecification tests are presented as follows:

Test for Hetroscedasticity

To test for the presence of heteroscedasticity, the popular white test was employed (Brooks 2008). As shown in table 4.3, both the F-statistic and Chi-Square versions of the test statistic gave the same conclusion that there is no proof for the presence of heteroscedasticity in this particular study, since the p-values were significantly in excess of 0.05. The third version of the test statistic, „Scaled explained SS" also gave the same conclusion that there is no evidence for the presence of heteroscedasticity problem, since the p-value was considerably in excess of 0.05. Therefore, the null hypothes that the variance of the errors is constant (homoscedasticity) should not be rejected.

Table 4.3 Heteroskedasticity Test: White

F-statistic	1.602178	Prob. F(44,51)	0.0562
Obs*R-squared	55.70232	Prob. Chi-Square(44)	0.1110
Scaled explained SS	40.86005	Prob. Chi-Square(44)	0.6070

Source: Financial statements of banks, MoFED reports and own computation

Test for Autocorrelation

As noted in Brooks (2008) this is an assumption that is assumed the errors are uncorrelated with one another. As mentioned in the previous chapter to empirically examine the impact of financial risks on the profitability of Ethiopia commercial banks 96 observations and eight regressors along with an intercept term were used in the model. Therefore, the relevant critical values for 96 observations and 8 regressors in Durbin-Watson test statistic table have shown an upper critical value (dU) of 1.715 and a lower critical value (dL) of 1.358 and 4 - dU = 4-1.715=2.285; 4 - dL = 4-1.358 =2.642. As shown in table 4.4, the Durbin-Watson test statistic of this study is 1.687 which is clearly between the lower limit (dL) which is 1.358 and the upper limit which is 1.715 and thus the null hypothesis of no autocorrelation is neither rejected nor not rejected.

Table 4.4 Autocorrelation Test: Durbin Watson

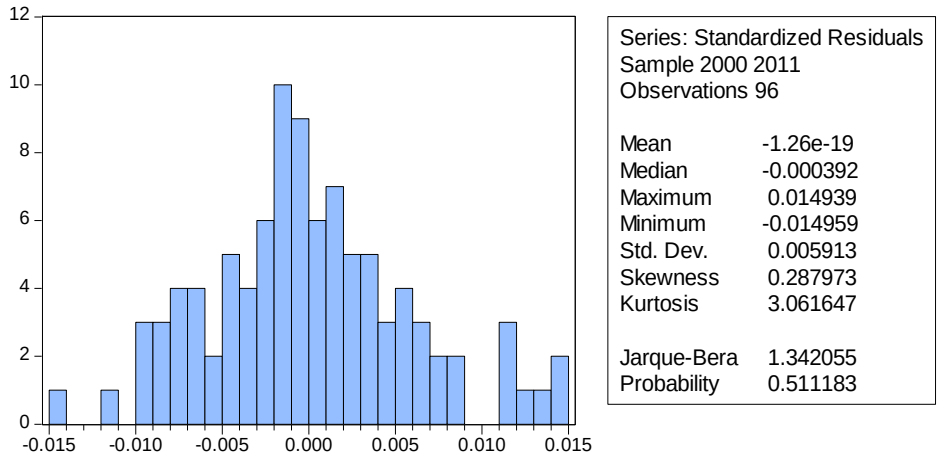
Variables	DW test static result
All bank-specific & macro-Economic	1.687

Source: Financial statements of banks, MoFED reports and own computation

Test for normality

In this study, the normality of the data was checked with the popular Bera-Jarque test statistic (Brooks 2008). According to Bera-Jarque test statistic, normally distributed data is not skewed and has a coefficient kurtosis of 3. As shown in figure 4.1, the coefficient kurtosis(3.06) of the data in this particular study was very much closer to 3, and the Bera-Jarque statistic had a P-value of 0.5112 implying that there was no evidence for the presence of abnormality in the data. Thus, the null hypothesis that the data is normally distributed should not be rejected since the p-value was considerably in excess of 0.05 and the coefficient of kurtosis very much closer to 3.

Figure 4.1 Normality test for residuals: Bera-Jarque



Source: Financial statements of banks, MoFED reports and own computation

Test for Multicollinearity

According to Hair et al. (2006) multicollinearity problem exists when the correlation coefficient among the variables are greater than 0.90. As shown in table 4.5, in this study there was no correlation coefficient that exceeds 0.90 (since the highest

correlation coefficient was 0.77). However, Kennedy (2008) suggested that any correlation coefficient above 0.7 could cause a serious multicollinearity problem.

Table 4.5 Correlation matrixes of independent variables

	CR	LIQ	IRR	FORX	SIZE	GDP	CAP	INFL
CR	1							
LIQ	-0.174	1						
IRR	-0.054	-0.210	1					
FORX	-0.147	0.221	-0.254	1				
SIZE	-0.019	0.112	-0.766	0.142	1			
GDP	-0.450	0.156	-0.151	-0.119	0.369	1		
CAP	-0.398	0.305	0.396	0.140	-0.546	-0.079	1	
INFL	-0.359	0.253	-0.182	-0.117	0.392	0.383	-0.042	1

Source: Financial statements of banks, MoFED reports and own computation

So as to mitigate the above controversy among Hair et al. (2006) and Kennedy (2008), variance inflation factor which is considered as standard statistical technique for testing data for multicollinearity was run (Gujarati 2004). According to this test, multicollinearity problem exist when the pair wise correlation values is in excess of 10 score. As shown in table 4.6, there is no pair wise correlation values that exceeds 10 score. Therefore, it can be concluded that there is nomulticollinearity problem in this particular study.

Table 4.6 Collinearity Statistics

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.079	.024		-3.339	.001		
	CR	-.033	.008	-.322	-3.939	.000	.522	1.914
	IRR	.001	.001	.182	1.834	.070	.353	2.834
	LIQ	-.012	.006	-.142	-2.015	.047	-.024	.000
	FORX	.000	.000	.112	1.628	.107	.000	.001
	GDP	.094	.021	.345	4.461	.000	.052	.136
	INFL	.006	.008	.058	.764	.447	-.010	.021
	size_	.005	.001	.519	4.287	.000	.002	.007
	Cap	.102	.023	.401	4.439	.000	.056	.147

a. Dependent Variable: ROA

Source: Financial statements of banks, MoFED reports and own computation

Test for model misspecification error

So as to ensure the reliability and the validity of the model, Ramsey reset test (model misspecification error test) was conducted. As shown in table 4.7, both the F-statistic and Log likelihood ratio of the test statistic gave the same conclusion that there is no evidence for the presence of model misspecification error. There is no apparent non-linearity in the regression equation of this particular study, since the p-values were considerably in excess of 0.05. Therefore, the null hypothesis that the models functional form is appropriate should not be rejected.

Table 4.7. Ramsey RESET Test:

F-statistic	0.207373	Prob. F(1,86)	0.6500
Log likelihood ratio	0.231208	Prob. Chi-Square(1)	0.6306

Source: Financial statements of banks, MoFED reports and own computation

In general based on diagnostic tests of the CLRM assumptions presented in the above sections, it can be concluded that both the data and the model are free from major threat of misspecifications (diagnostic) problems. Hence the next section presents results of regression analysis.

4.2.1.4. Results of Regression Analysis

There are broadly two classes of panel estimator approaches that can be employed in financial research: fixed effects models (FEM) and random effects models (REM) (Brooks 2008). The general accepted way of choosing between fixed and random effects is running a Hausman test. To conduct a Hausman test the number of cross section should be greater than the number of coefficients to be estimated. But, in this study the numbers of coefficients are greater than the number of cross sections so it is not possible to conduct a Hausman test.

Moreover according to Gujarati (2004), if T (the number of time series data) is large and N (the number of cross-sectional units) is small, there is likely to be little difference in the values of the parameters estimated by fixed effect model/FEM and random effect model/REM. Also according to Brooks (2008) and Verbeek (2004), the REM is more appropriate when the entities in the sample can be thought of as having been randomly selected from the population, but a FEM is more plausible when the entities in the sample effectively constitute the entire population/sample frame. Since

the number of time series (i.e. 12 year) is greater than the number of cross-sectional units (i.e. 8 commercial banks), and the sample for this study was not selected randomly and equals to the sample frame FEM is considered as appropriate for this study. Thus, also considering its computational convenience a fixed cross-sectional effect is specified in the estimation in this study.

As mentioned earlier, the purpose of regression analysis in this study was to examine the importance of each independent variable in explaining the variation of profitability in Ethiopian commercial banks. Accordingly, the estimation result of the operational panel regression model used in this study is presented in table 4.8. As shown in table 4.8 the R-squared statistics and the adjusted-R squared statistics of the model were 76.35% and 71.91% respectively. The adjusted- R^2 of this study indicates that, 71.91% of the variation on the dependent variable (ROA) was explained by the changes in the independent variables. Thus it can be concluded that, all the independent variables used in this study collectively, were good explanatory variables of profitability in Ethiopian commercial banks (ECBs). Hence the null hypothesis of F-statistic (the overall test of significance) that the R^2 is equal to zero was rejected at 1% significance level (p-value =0.0), which enhanced the reliability and validity of the model.

Table 4.8 First Step (General) Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.130218	0.029361	-4.435017	0.0000
CR	-0.027858	0.009267	-3.006176	0.0035*
LIQ	-0.016752	0.005744	-2.916247	0.0046*
IRR	-8.77E-05	0.000672	-0.130619	0.8964
FORX	9.22E-06	0.000299	0.030853	0.9755
CAP	0.147610	0.026728	5.522620	0.0000*
SIZE	0.006931	0.001350	5.135458	0.0000*
GDP	0.078192	0.021374	3.658321	0.0005*
INFL	-0.003115	0.008127	-0.383236	0.7026

R-squared	0.763450	Durbin-Watson stat	1.686658
Adjusted R-squared	0.719096		
F-statistic	17.21294		
Prob(F-statistic)	0.000000		

* denote significance at 1% level.

Source: Financial statements of banks, MoFED reports and own computation

As shown in table 4.8, the coefficient estimate of real GDP growth and capital (equity to total asset ratio) were positive and statistically significant at 1% significance level. The coefficient estimates of the aforementioned variables were 0.0782 and 0.148 indicating the existence of strong positive relationship between ROA and the above mentioned independent variables. In addition, the coefficient estimate of bank size was positive that implying a direct association with ROA. The association was significant at 1% significance level. Thus, it can be concluded that, an increase on those variables would also increase the profitability (ROA) of Ethiopian commercial

banks. On the other hand, the coefficient estimates of credit risk and liquidity risk were negative and statistically significant at 1% significance level. This clearly indicates that, an increase in the credit risk and liquidity risk of Ethiopian commercial banks leads to a decrease in their profitability. The coefficient estimate of foreign exchange rate risk was positive but it was statistically insignificant. In addition, the coefficient estimates of inflation and interest risk have shown a negative association with ROA. The inverse association indicated that, an increase on those variables would decrease the profitability (ROA) of Ethiopian commercial banks. However, the association was not statistically significant. That means, the importance of the abovementioned variables in explaining the variation of profitability in Ethiopian commercial banks was statistically inconsiderable.

As mentioned earlier in chapter three of this paper, only the variables CR, LIQ, CAP, SIZE, and GDP that were found significant in the first step regression analysis were regressed once again in order to ensure the reliability and the consistency of the first step regression results both in terms of the coefficient estimates and the level of significance. Table 4.9 shows the second step multiple regression results in which the insignificant variables were dropout. Comparing the results of the two regression analysis, major differences were not found in R-squared statistics, adjusted-R squared statistics and Durbin-Watson stat in both regression results. The R-squared statistics and adjusted-R squared in the second regression were 76.28% and 72.85% respectively. In comparison to the first regression result there were no exaggerated difference in both R-square and adjusted square statistics which were 76.35% and 71.91% respectively. Similarly, the results of Durbin-Watson statistics in both the first and second step regression were almost equal. In addition, significant variables

that were found in the first step regression were remained significant with the same significance level in the second step regression. Moreover, the sign and the magnitude of coefficient estimates in both the first and second step regression were almost similar.

Table 4.9 Second Step Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.127610	0.022792	-5.598939	0.0000
CR	-0.027196	0.008700	-3.125818	0.0024*
LIQ	-0.016849	0.005269	-3.197686	0.0020*
CAP	0.146968	0.024707	5.948376	0.0000*
SIZE	0.006805	0.001008	6.747913	0.0000*
GDP	0.077742	0.019216	4.045674	0.0001*
R-squared	0.762759	Durbin-Watson stat		1.695646
Adjusted R-squared	0.728459			
F-statistic	22.23791			
Prob(F-statistic)	0.000000			

* denote significance at 1% level.

Source: Financial statements of banks, MoFED reports and own computation

Based on the above discussions, it can be concluded that the results obtained from the first (general) regression analysis were consistence with the result of the second regression analysis, which enhanced the reliability and validity of the data used in the model.

4.2.2. In-depth interview results

In supplement to the structured review of financial records, this study employed in-depth interviews with commercial banks officials. In depth interviews were conducted with six Ethiopian commercial banks Officers/managers of finance and risk management departments. The interviewees were from both private and state owned banks namely Construction and Business Bank, Commercial Bank of Ethiopia, Awash international bank, Dashen bank, United bank and Bank of Abyssinia. All the interviewees were interviewed independently at different times. The interview questions were fully unstructured and focused on the identification of financial risks affecting Ethiopian banks profitability in general. More specifically, the interview questions were also tried to identify how those risks can influence profitability, the major determining factors among the influential factors, measures taken by the banks to reduce the negative influence of controllable factors and their general opinion regarding the matter.

According to an interview conducted with the abovementioned finance managers, Credit risk, liquidity risks, operational risk and market risk were found to be the major risks that affected profitability of commercial banks over the sampled period. Among all the risks mentioned above, all the interviewees agreed that credit risk was the main and the most important financial risk that negatively affects the profitability of Ethiopian commercial banks. The interviewees also suggested that 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 risk. The interviewees also suggested liquidity risk (the risk that banks do not have sufficient cash or borrowing capacity to meet deposit withdrawals or new

loan demand) as the second major financial risk that can negatively affect the profitability of Ethiopian banks. Hence, So as to ensure the availability of sufficient funds to meet demands of deposit withdrawals and borrowers at reasonable costs, Ethiopian banks gave greater emphases to efficient and effective management of liquidity risk.

Despite the prior expectation and theory that suggested financial risk like, interest rate risk, and foreign exchange rate risk (volatility of exchange rate) are the major factors that determine the variation of banks profitability, as per the interviewees the above financial risks were not found to be the major factors that can affect profitability of Ethiopian banks. All the interviewees agreed that the abovementioned financial risk have an inverse relationship with profitability of Ethiopian banks. However, as result of different factors that existed in the banking industry of Ethiopia, the influence of the abovementioned variables was not considerable.

In addition to the financial risks that affect the profitability of Ethiopian banks, the interviewees also suggest that other factors like capital strength, size of banks and growth in GDP had a positive effect on the profitability of Ethiopian banks. On the other hand, other factors like, government regulations which imposed on private banks like the credit cap and the new regulation by the government require all commercial banks to purchase National Bank of Ethiopia bonds (contribution for the long-term investment and infrastructural development projects) worth 27% of their gross loan disbursements with a maturity of 5 years at a relatively minimum interest rate (3%) which was even below the average 5% deposit rate paid by most of the privately owned banks for their depositors also considered as a factor that affects Ethiopian private banks profitability. Similar to the above factors absence of active

secondary stock market and inflation were also considered as factors that affect Ethiopian banks profitability.

4.3. Discussions of the Results

The preceding sections presented the result of the documentary analysis and in-depth interviews. The purpose of this section is to discuss the results obtained from different data sources. The analysis is based on the results of the documentary analysis mainly using the results of the regression analysis between the dependent variable and the independent variables presented in table 4.8 and in-depth interview presented in the preceding section. The results obtained under these different methods are jointly analyzed. Hence the subsequent discussions try to present the analysis of results in light of the specific research question and hypotheses stated in section 4.1.

4.3.1. Credit risk

As shown in the literature review part of this study, there appears to be a consensus that banks profitability is inversely associated with credit risk. The decisive argument here is that, an increase in credit risk (non performing loans), which do not accrue income, requires a bank to allocate a significant portion of its gross margin to provisions to cover expected credit losses; thus, profitability will be lower. As shown in table 4.8, the coefficient estimate of credit risk measured by the ratio of nonperforming loan to total loans was -0.0279 and statistically significant at 1% significant level($p=0.0035$). This implies that an increase in credit risk, certainly lead to a decrease in profit as measured by ROA. This means banks which fail to monitor their credit loans tend to be less profitable than those which pay particular attention to assets quality. The finding was in consistent to the results of Kosmidou (2008), Tafri

et al. (2009), Ara (2009), Kithinji (2010), Tefera (2011), Olweny & Shipho (2011) and Al-Khouri (2011). Therefore, it can be conclude that credit risk was a key driver of profitability in commercial banks of Ethiopia. Similarly, the result obtained from interview also clearly supports the regression output. As per the interview conducted with finance managers of selected Ethiopian commercial banks, credit risk was the major factor that affects the profitability of Ethiopian commercial banks negatively. So as to minimize this risk, Ethiopian banks began to establish a close relationship with the borrowers through customer relation managers (CRMs). Hence, the segregated duty provided to each CRMs increase their influence on borrowers management through frequent dealings over time and enables a bank to reduce risk and uncertainty associated with lending. Moreover, the traditional lending system of Ethiopian banks in which every branch managers approved a loan had been changed and currently loan applications can only be approved at district or at head office level. Hence, the existing centralized loan application evaluation system enables banks to use their management expertise and reduce risk associated with lending and ultimately came up with high profit as measured by ROA.

4.3.2. Liquidity risk

The coefficient estimate of liquidity risk measured by the ratio of liquid asset to liabilities revealed negative association with profitability reported by Ethiopian commercial banks. The negative coefficient estimate (-0.017) implies the existence of inverse association among liquidity risk and profitability. Moreover, the magnitude the coefficient estimate was statistically significant at 1% significance level. That means the importance of liquidity risk in explaining the variation of profitability in

the Ethiopian banking industry was significant under the period of consideration. As far as liquidity risk is the risk that banks do not have sufficient amount of cash to meet the demand of deposit withdrawals or new loan applications, banks may be forced to borrow emergency funds at excessive cost that may adversely affect the profitability of banks. The finding was in consistent with prior expectation and theory that suggested banks that are exposed to liquidity risk are usually associated with lower rates of return. In addition, this result was also consistence with previous studies of Shen et al. (2009), Bordeleau and Graham, (2010). The result generated from the interview also suggested liquidity risk was one of the major factors that determine the variation of profitability in Ethiopian commercial banks. Hence, it can be concluded that liquidity risk was the major factor that adversely affects profitability of Ethiopian commercial banks over the sampled period.

4.3.3. Interest Rate Risk

The coefficient estimate of interest risk measured by the ratio of rate sensitive assets to rate sensitive liabilities revealed a negative association with the profitability of Ethiopian banks. The negative coefficient estimate suggested the existence of inverse relationship between interest rate risk and profitability. The indicates that in the scenario of rising interest rate, when liabilities re-price faster than assets, interest spread would fall and hence profitability of the bank would be adversely affected. However, this negative relationship was not found statistically significant even at 10 % significance level (p-value =0.8964). Hence, the findings suggested that, there was no significant association among interest rate risk and profitability of Ethiopian commercial banks as far as the parameter for this variable was statistically

insignificant as illustrated by the p-values of 0.89. In the same way, the findings from interviews data were also provide further support for the findings of the regression result which demonstrates that, interest rate risk was not a proper factor that determine the variation of profitability in Ethiopian commercial banks. As per the interview conducted with finance manager of selected Ethiopian commercial banks, Ethiopian banks are not freely allowed to make adjustment on their lending and deposit rates so as to cover time value of money, inflation and investment risk. For instance, the minimum deposit rate (5%) was determined by the national bank of Ethiopia. Consequently, the volatility of interest rate risk in Ethiopian commercial banks was very small under the period of consideration. Therefore, the significance of interest rate risk in explaining the variation of profitability would also be very small or insignificant.

4.3.4. Foreign exchange risk

Foreign exchange rate risk was considered to be one of the key factors which can affect the profitability of commercial banks in Ethiopia. Despite this as shown in table 4.8 foreign exchange rate risk measured with volatility of exchange rate revealed a positive association with the profitability of Ethiopian commercial banks but it is statistically insignificant. As shown in the regression results of the first regression and general model the p-value of foreign exchange rate risk was 0.98. The finding is in contrary to the findings of empirical study of Popov & Stutzmann, (2003) which indicated negative relationship between foreign exchange rate risk and profitability of Swiss companies. The finding is not also as anticipated. The insignificant parameter indicates that the volatility of exchange rate (in terms of dollar) was not a factor

considerably influenced the profitability of the banking sector in Ethiopia under the period of consideration. Thus the hypothesis that states there is a significant negative relationship between foreign exchange rate risk and profitability may be rejected or data did not support the hypothesis. This result is somewhat surprising and the possible reason for this may be as a result of that banks are allowed to take open positions in foreign currencies subject to regulatory limits set by the NBE.

The result obtained from interview was also supported the result of the regression output. As per the interview, as the value of Ethiopian birr depreciated in terms of dollar, it can increase the competitiveness export-oriented Ethiopian firms in the international market. Consequently, the debt-servicing capacity of export-oriented Ethiopian firms would improve and ultimately increase the performance of banks. On the other hand, the devaluation of Ethiopian birr in terms of dollar may adversely affect the performance of import-oriented Ethiopian firms. However, as per the interviewee‟s opinion, the import market in Ethiopia was dominated by limited numbers of importers that have strong relationship with banks. Hence, the profit originated from the monopolistic advantage of importers enables their debt servicing easier and ultimately improve the performance of Ethiopian banks. In this general setting, it can be concluded that, the influence of exchange rate volatility on the profitability of Ethiopian banks inconsiderable.

As mentioned earlier, in this study four major independent variables (financial risks) namely; credit risk, interest rate risk, liquidity risk and foreign exchange risk and four controlled variables (namely; capital strength, size of a bank, GDP growth and inflation) were incorporated. The importance of each financial risks in explain the

variation of profitability in Ethiopian commercial banks have been discussed so far. Accordingly, the following sections discuss the result of the controlled variables obtained from the regression analysis output.

4.3.5. Capital strength

The coefficient estimate of capital strength which was measured by the equity to asset ratio was positive and statistically significant at 1% significance level (p-value=0). Moreover, the magnitude of the coefficient estimate (0.140) was relatively higher as compared to other variables indicated the existence of strong positive relationship between capital and profitability. This is in line with the prior expectation as a bank with a sound capital position is able to pursue business opportunities more effectively and has more time and flexibility to deal with problems arising from unexpected losses, thus achieving increased profitability. The finding was consistent with the resultes of previous studies of Athanasoglou et al. (2005), Li (2007), Tafri et al. (2009), Ramlall (2009), Damena (2011) and Abera (2012). Similarly, the result obtained from interview clearly supports the regression output. As per the interview conducted with the finance managers of the selected banks, capital strength is one of the major factors that can affect Ethiopian banks profitability certainly. That means an increase in capital will lead to an increase in profitability by bringing good will to them, which gives for them the ability to finance their financial needs through debt without the need for collateral. That means having more and more capital leads to more and more profitability by increasing their loan providing capacity. Therefore, the finding concluded that, capital strength was the major factor that can determine the variation of profitability in Ethiopian commercial banks.

4.3.6. Bank Size

As shown in table4.7, bank size which was measured by the natural log of total assets had positive association with the profitability of Ethiopian commercial banks. The variable was also statistically significant at 1% significance level (p value=000). The finding was in accordance with the theory and prior expectation that suggested larger banks may incur lower cost for efficient information gathering, processing and analyzing due to economies of scale. That means bigger banks can have lower costs per unit of income and therefore higher profit margin. Similarly, banks with larger branch network can penetrate deposit markets and mobilize savings at a lower cost as compared to smaller banks and ultimately came up with higher profit. Therefore, in Ethiopia larger banks were better placed than smaller banks of the country in harnessing economies of scale in transactions over the sampled period. From this one can conclude that, profitability tends to be higher in larger banks of Ethiopia as compared to smaller banks through economies of scale. The finding was in consistent with the findings of Kapur and gualu (2011), Damena (2011) and (Afzal, 2011). Similarly, the result generated from the interview also supports the output of the regression analysis fully. That is Ethiopian banks profitability increases as the size of the banks increase, which strengths the fact that larger banks are enjoying higher profit than smaller banks of the country.

4.3.7 Gross domestic product

The coefficient estimate of real GDP growth revealed a positive and statistically significant association with the profitability of Ethiopian commercial banks at 1% significance level (p-value of =0.0005). The magnitude of the coefficient estimate

(0.077) indicates the existence of strong positive relationship between real GDP growth and profitability of Ethiopian banks. The findings was in accordance with prior expectation and theory that suggested whenever there was a positive GDP growth, the economic activities in general were increasing and the volume of cash held for either businesses or households was increasing. These conditions contributed to decrease the likelihood that borrowers delay their financial obligations. In addition, strong positive growth in real GDP creates a new and potential demand for financial services that can easily translates into more income. Hence, it can be concluded that, the existing ever increasing economic growth in Ethiopia over the sampled period creates a new and potential demand for financial services and ultimately increase the profitability of Ethiopian commercial banks. The findings suggested that, real GDP growth was one of the vital determinants of NPLs in Ethiopian commercial banks. This result was in consistent with the findings of Pasiouras & Kosmidou (2007), Abera (2012) and Ponce (2012). Similarly, the result obtained from the interview also highly supported the output of the regression analysis. Moreover, this result also consistent with the existing reality in the Ethiopian banking industry where the profitability of Ethiopian banks shows a parallel increase as the economy grows up.

4.3.8. Inflation

As mentioned in the literature review part, inflation affects banks performance through different channels and its impact on profitability can be positive or negative. If the inflation is not anticipated, the banks may be slow in adjusting their interest rates and this adversely or negatively affects bank performance. On the other hand, if the inflation is anticipated, banks may get an opportunity to adjust their interest rates accordingly and resulted with revenues that increased faster than costs. Despite this

fact, the coefficient estimate of inflation in this particular study revealed a negative association with the profitability of Ethiopian commercial banks. This implies the existence of 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 Ethiopia as far as the parameter for this variable is insignificant as illustrated by a p-values of 0.70. This is because of the existence of a lower real interest rate which is obviously lower than the real inflationary rate, resulting in costs increased faster than revenues. In Ethiopia the maximum lending rate is determined by National bank of Ethiopia and banks are not unable to adjust their lending rate in accordance with inflation rate. For instance, the average annual inflation rate in Ethiopia over the period of consideration was 11% with a maximum of 36.4%. Despite this fact, the average lending rate never exceeds 12.75% over the sample period. This clearly indicates the lending rate in Ethiopia was far below from the market interest rate. In conclusion the result clearly reveals as Ethiopian banks profitability is not influenced by inflation.

The previous chapter discussed the findings of the study obtained from different data sources. The purpose of this chapter is to discuss the conclusions and recommendations. Accordingly, the chapter is organized in two sections, the first section, 5.1 presents the conclusions of the study. And, the second section, 5.2 presents the recommendations that provided based on the findings of the study.

5.1. Conclusions

The main objective of this study was to examine the impact of financial risks in profitability of Ethiopian commercial banks. To achieve this objective, a mixed methods research approach was adopted. However, by considering the nature of the study, quantitative research approach was dominantly used. To collect the necessary data the study mainly used survey of documents (structured review of financial records). In addition to this, in order to support the results obtained from the quantitative method, in depth interview with selected finance managers of Ethiopian commercial banks were also conducted. To this end, the collected data from a sample size of eight Ethiopian commercial banks over the period of 2000 to 2011were analyzed using descriptive statistics, correlation matrix and multiple linear regression analysis. The analyses were made in accordance to the stated hypotheses and specific research questions formulated in the study.

In order to conduct the empirical analysis, one dependent variable (profitability measured by ROA), and eight independent variables were selected; namely, credit risk liquidity risk, interest rate risk , foreign exchange risk, size, capital, GDP growth and inflation. The variables were selected by refereeing different theories and empirical studies that have been conducted on banks profitability and financial risks.

Consequently, the empirical findings of this particular study suggested the following conclusions:

First, among all financial risks that were involved in this study, credit risk was the major factor that determines the variation of profitability in Ethiopian commercial banks under the period of consideration. The finding suggested a negative and statistically significant association with 1% significance level. This was in accordance with prior expectation and theory that suggested banks which fail to monitor their credit loans tend to be less profitable than those which pay particular attention to assets quality. In addition, the coefficient estimate of liquidity risk was also revealed a negative association with the profitability of Ethiopian commercial banks. The association was statistically significant at 1% significance level. This indicated that, the existence of high liquidity risk may force banks to borrow emergency funds at excessive cost that can adversely affect their profitability.

Second, the coefficient estimate of interest rate risk and inflation were revealed a negative association with profitability of Ethiopian commercial banks. However, the coefficient estimates of the above mentioned variables were not statistically significant. Hence, interest rate risk and inflation were not a proper factor that determines the variation of profitability in Ethiopian commercial banks. Whereas, the coefficient estimates foreign exchange rate risk revealed a positive association with profitability of Ethiopian commercial banks but statistically was not significant. Therefore, foreign exchange rate risk was not found to be the major factor that determined the profitability of Ethiopian banks.

Third, among controlled variables, namely; bank size, capital strength and GDP growth were found to be the major factors determining the volatility of profit in Ethiopian commercial banks. The coefficient estimates of the above mentioned controlled variables were positive and statistically significant at 1% significance level. The magnitude of the coefficient estimate of capital was relatively high as compared to other variables, showing that an increase in capital strength will result in increased profitability. This is in line with the expectation as a bank with a sound capital position is able to pursue business opportunities more effectively and has more time and flexibility to deal with problems arising from unexpected losses, thus achieving increased profitability. The magnitude of the coefficient estimate of bank size was relatively small. This indicates that as larger banks of the country relatively experience more significant increases in profitability through economies of scale.

5.2. Recommendations

In line with the findings of the study, the following recommendations have been forwarded.

Both the results obtained from the regression analysis and the interview result suggested that, among all the risks that Ethiopian banks faced credit risk was the major factor that can adversely affect the profitability of Ethiopian banks. Therefore, Ethiopian banks should focus on credit risk management on the bases of maximizing return on its assets while keeping its credit exposure within acceptable limits. To do so, the bank should regularly review their credit portfolio quality, provisioning requirements, and customer exposure.

Liquidity risk was one of the factors that can affect the profitability of Ethiopian banks negatively since failure to properly manage liquidity can quickly result in significant unanticipated losses. Therefore, Ethiopian banks should have optimal level of liquidity which enables banks to meet their contractual commitments.

Finally, the study sought to investigate the impact of financial risks on the profitability of Ethiopian commercial banks. For comprehensive investigation future researcher could increase the number of observations by increasing the sample size and extending the period of time with unbalanced data. In addition, future research could cover cross countries to capture countries differences and to uncover difference from financial system and regulation factors.

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APPENDICES

Appendices

Appendix –I: Tests for the Heteroskedasticity Test: White

Heteroskedasticity Test: White

F-statistic	1.602178	Prob. F(44,51)	0.0562
Obs*R-squared	55.70232	Prob. Chi-Square(44)	0.1110
Scaled explained SS	40.86005	Prob. Chi-Square(44)	0.6070

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 8/06/13 Time: 03:20
Sample: 1 96
Included observations: 96

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.002436	0.007212	0.337811	0.7369
CR	0.002907	0.004042	0.719097	0.4754
CR^2	0.000313	0.001344	0.232682	0.8169
CR*LIQ	0.000895	0.001271	0.704094	0.4846
CR*IRR	2.44E-06	8.55E-05	0.028542	0.9773
CR*FORX	3.34E-05	5.50E-05	0.607514	0.5462
CR*CAP	-0.003992	0.007343	-0.543660	0.5890
CR*SIZE	-0.000155	0.000178	-0.870438	0.3881
CR*GDP	0.002902	0.002451	1.184189	0.2418
CR*INFL	0.001929	0.001565	1.232891	0.2233
LIQ	-0.004987	0.002781	-1.793503	0.0788
LIQ^2	0.000429	0.000620	0.691814	0.4922
LIQ*IRR	0.000183	9.37E-05	1.956480	0.0559
LIQ*FORX	2.02E-05	3.76E-05	0.537825	0.5930
LIQ*CAP	0.001449	0.003301	0.439046	0.6625
LIQ*SIZE	0.000184	0.000122	1.506342	0.1381
LIQ*GDP	0.002697	0.004077	0.661681	0.5112
LIQ*INFL	0.001408	0.001028	1.369005	0.1770
IRR	0.000288	0.000428	0.672823	0.5041
IRR^2	2.18E-06	4.16E-06	0.523365	0.6030
IRR*FORX	3.87E-06	3.80E-06	1.019867	0.3126
IRR*CAP	-0.000553	0.000358	-1.543019	0.1290
IRR*SIZE	-1.62E-05	2.00E-05	-0.808941	0.4223
IRR*GDP	-1.48E-05	0.000293	-0.050500	0.9599
IRR*INFL	0.000147	0.000113	1.292514	0.2020

FORX	-3.92E-05	0.000141	-0.278023	0.7821
FORX^2	4.44E-06	3.14E-06	1.414095	0.1634
FORX*CAP	-0.000148	0.000159	-0.929582	0.3570
FORX*SIZE	3.93E-07	6.21E-06	0.063293	0.9498
FORX*GDP	2.98E-06	0.000419	0.007109	0.9944
FORX*INFL	2.56E-06	6.61E-05	0.038754	0.9692
CAP	0.007078	0.012144	0.582826	0.5626
CAP^2	-0.005259	0.007727	-0.680572	0.4992
CAP*SIZE	-0.000206	0.000512	-0.403529	0.6882
CAP*GDP	-0.009742	0.007917	-1.230521	0.2241
CAP*INFL	-0.006510	0.003291	-1.977926	0.0534
SIZE	-0.000158	0.000658	-0.239881	0.8114
SIZE^2	2.59E-06	1.55E-05	0.166972	0.8681
SIZE*GDP	-0.000751	0.000544	-1.378513	0.1741
SIZE*INFL	3.17E-05	0.000155	0.203774	0.8393
GDP	0.013766	0.011845	1.162123	0.2506
GDP^2	0.005281	0.016098	0.328027	0.7442
GDP*INFL	0.013339	0.007810	1.707988	0.0937
INFL	-0.001189	0.003521	-0.337546	0.7371
INFL^2	-0.001385	0.001337	-1.036159	0.3050

R-squared	0.580232	Mean dependent var	4.44E-05
Adjusted R-squared	0.218080	S.D. dependent var	5.97E-05
S.E. of regression	5.28E-05	Akaike info criterion	-16.55623
Sum squared resid	1.42E-07	Schwarz criterion	-15.35419
Log likelihood	839.6989	Hannan-Quinn criter.	-16.07034
F-statistic	1.602178	Durbin-Watson stat	2.361930
Prob(F-statistic)	0.052566		

Appendix –II: Model specification error (linearity) test: Ramsey RESET Test

Ho: The models functional form is appropriate

Ha: The models functional form is inappropriate

Ramsey RESET Test:

F-statistic	0.207373	Prob. F(1,86)	0.6500
Log likelihood ratio	0.231208	Prob. Chi-Square(1)	0.6306

Test Equation:
Dependent Variable: ROA
Method: Least Squares
Date: 10/06/13 Time: 03:45
Sample: 1 96
Included observations: 96

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.049930	0.068220	-0.731900	0.4662
CR	-0.025881	0.018070	-1.432287	0.1557
LIQ	-0.008453	0.009783	-0.864130	0.3899
IRR	0.000813	0.000964	0.844212	0.4009
FORX	0.000319	0.000402	0.792754	0.4301
CAP	0.072781	0.067600	1.076637	0.2847
SIZE	0.003181	0.003340	0.952326	0.3436
GDP	0.075634	0.045752	1.653130	0.1020
INFL	0.004210	0.008673	0.485449	0.6286
FITTED^2	4.193124	9.207910	0.455383	0.6500

R-squared	0.697085	Mean dependent var	0.032320
Adjusted R-squared	0.665385	S.D. dependent var	0.012158
S.E. of regression	0.007033	Akaike info criterion	-6.978052
Sum squared resid	0.004254	Schwarz criterion	-6.710933
Log likelihood	344.9465	Hannan-Quinn criter.	-6.870078
F-statistic	21.98980	Durbin-Watson stat	1.387135
Prob(F-statistic)	0.000000		

Appendix –III: First Step Regression Results

Dependent Variable: ROA
Method: Panel Least Squares
Date: 10/06/13 Time: 00:24
Sample: 2000 2011
Periods included: 12
Cross-sections included: 8
Total panel (balanced) observations: 96

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.130218	0.029361	-4.435017	0.0000
CR	-0.027858	0.009267	-3.006176	0.0035
LIQ	-0.016752	0.005744	-2.916247	0.0046
IRR	-8.77E-05	0.000672	-0.130619	0.8964
FORX	9.22E-06	0.000299	0.030853	0.9755
CAP	0.147610	0.026728	5.522620	0.0000
SIZE	0.006931	0.001350	5.135458	0.0000
GDP	0.078192	0.021374	3.658321	0.0005
INFL	-0.003115	0.008127	-0.383236	0.7026

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.763450	Mean dependent var	0.032320
Adjusted R-squared	0.719096	S.D. dependent var	0.012158
S.E. of regression	0.006444	Akaike info criterion	-7.100342
Sum squared resid	0.003322	Schwarz criterion	-6.672951
Log likelihood	356.8164	Hannan-Quinn criter.	-6.927584
F-statistic	17.21294	Durbin-Watson stat	1.686658
Prob(F-statistic)	0.000000		

Appendix –IV: second step regression results

Dependent Variable: ROA
Method: Panel Least Squares
Date: 10/26/13 Time: 02:49
Sample: 2000 2011
Periods included: 12
Cross-sections included: 8
Total panel (balanced) observations: 96

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.127610	0.022792	-5.598939	0.0000
CR	-0.027196	0.008700	-3.125818	0.0024
LIQ	-0.016849	0.005269	-3.197686	0.0020
CAP	0.146968	0.024707	5.948376	0.0000
SIZE	0.006805	0.001008	6.747913	0.0000
GDP	0.077742	0.019216	4.045674	0.0001

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.762759	Mean dependent var	0.032320
Adjusted R-squared	0.728459	S.D. dependent var	0.012158
S.E. of regression	0.006336	Akaike info criterion	-7.159927
Sum squared resid	0.003332	Schwarz criterion	-6.812671
Log likelihood	356.6765	Hannan-Quinn criter.	-7.019560
F-statistic	22.23791	Durbin-Watson stat	1.695646
Prob(F-statistic)	0.000000		

Appendix- V: Ratio Data

year	Bank	CR	IRR	LIQ	FORX	GDP	INFL	ROA	size	Cap
2000	CBE	0.2644	-3.37238	0.35232	4.903008	0.059	0.054	0.031269	23.71036	0.065
2001	CBE	0.3377	-4.03766	0.28553	5.61426	0.074	-0.003	0.02536	23.79081	0.061
2002	CBE	0.5209	-7.15923	0.35914	5.953267	0.016	-0.106	0.022894	23.82092	0.037
2003	CBE	0.535	-3.00548	0.47397	1.12064	-0.021	0.109	0.01264	23.90962	0.053
2004	CBE	0.3768	-2.64439	0.78058	0.541248	0.117	0.073	0.017408	24.05458	0.053
2005	CBE	0.2752	-8.6683	0.74973	0.216986	0.126	0.061	0.023787	24.22488	0.043
2006	CBE	0.2245	-4.41899	0.68869	0.220841	0.115	0.106	0.031242	24.30258	0.042
2007	CBE	0.1452	-2.19669	0.73761	0.601927	0.118	0.158	0.026924	24.49501	0.097
2008	CBE	0.0533	-2.97916	0.69092	2.528459	0.112	0.253	0.037052	24.64357	0.091
2009	CBE	0.0366	-3.23911	0.42795	5.816814	0.099	0.364	0.045715	24.80775	0.085
2010	CBE	0.0188	-4.72975	0.34921	9.345763	0.104	0.028	0.03785	25.02985	0.075
2011	CBE	0.0086	-5.16832	0.43621	6.754427	0.114	0.181	0.037089	25.46179	0.055
2000	CBB	0.137	3.942029	0.27435	4.903008	0.059	0.054	0.02252	20.69692	0.071
2001	CBB	0.4812	3.955224	0.28317	5.61426	0.074	-0.003	0.007231	20.69074	0.069
2002	CBB	0.4155	0.922078	0.29685	5.953267	0.016	-0.106	0.008351	20.68036	0.08
2003	CBB	0.4009	1.392405	0.35935	1.12064	-0.021	0.109	0.014862	20.66352	0.084
2004	CBB	0.3547	1.253012	0.48684	0.541248	0.117	0.073	0.006623	20.7787	0.079
2005	CBB	0.2776	-0.07547	0.58617	0.216986	0.126	0.061	0.014192	21.32867	0.058
2006	CBB	0.1942	2.866242	0.57554	0.220841	0.115	0.106	0.043962	21.30938	0.087
2007	CBB	0.1706	1.825472	0.51056	0.601927	0.118	0.158	0.04288	21.35931	0.112
2008	CBB	0.1556	-0.59833	0.62694	2.528459	0.112	0.253	0.048077	21.5954	0.108
2009	CBB	0.1145	-1.43047	0.51527	5.816814	0.099	0.364	0.040895	21.6757	0.104
2010	CBB	0.0656	-2.09426	0.52945	9.345763	0.104	0.028	0.041429	21.87447	0.101
2011	CBB	0.0681	-2.17084	0.54215	6.754427	0.114	0.181	0.035093	21.97746	0.104
2000	DB	0.1595	0.896104	0.53884	4.903008	0.059	0.054	0.020809	20.57824	0.089

2001	DB	0.1092	-0.03226	0.39842	5.61426	0.074	-0.003	0.032727	20.81858	0.085
2002	DB	0.1422	-0.19672	0.42737	5.953267	0.016	-0.106	0.026245	21.11935	0.082
2003	DB	0.0889	-0.22481	0.40037	1.12064	-0.021	0.109	0.018584	21.4119	0.065
2004	DB	0.0744	-0.36047	0.40037	0.541248	0.117	0.073	0.029137	21.70796	0.064
2005	DB	0.0672	-0.93416	0.3604	0.216986	0.126	0.061	0.028363	21.95291	0.071
2006	DB	0.0621	-0.17098	0.31121	0.220841	0.115	0.106	0.040695	22.23751	0.085
2007	DB	0.0595	-0.59688	0.34376	0.601927	0.118	0.158	0.042708	22.52184	0.09
2008	DB	0.0589	-1.42654	0.47395	2.528459	0.112	0.253	0.042534	22.7811	0.093
2009	DB	0.0739	-3.21082	0.5934	5.816814	0.099	0.364	0.036166	22.99879	0.093
2010	DB	0.03	-2.60436	0.51805	9.345763	0.104	0.028	0.037076	23.23716	0.091
2011	DB	0.0338	-2.53352	0.52577	6.754427	0.114	0.181	0.042974	23.40839	0.095
2000	AIB	0.3027	0.393617	0.46531	4.903008	0.059	0.054	0.030303	20.44751	0.124
2001	AIB	0.205	-0.56731	0.40746	5.61426	0.074	-0.003	0.019846	20.62565	0.115
2002	AIB	0.3402	-0.92366	0.43333	5.953267	0.016	-0.106	0.017086	20.82943	0.118
2003	AIB	0.2513	0.058394	0.4768	1.12064	-0.021	0.109	0.012848	21.06045	0.098
2004	AIB	0.1839	-1.07742	0.50837	0.541248	0.117	0.073	0.019774	21.29425	0.088
2005	AIB	0.1202	-1.00000	0.44639	0.216986	0.126	0.061	0.024708	21.52347	0.102
2006	AIB	0.0956	-0.73026	0.3619	0.220841	0.115	0.106	0.037576	21.80643	0.103
2007	AIB	0.0736	-0.65283	0.36247	0.601927	0.118	0.158	0.053264	22.06613	0.113
2008	AIB	0.0866	-0.99904	0.47662	2.528459	0.112	0.253	0.042324	22.29604	0.124
2009	AIB	0.0578	-2.08124	0.64218	5.816814	0.099	0.364	0.031449	22.58315	0.117
2010	AIB	0.0547	-1.22805	0.66207	9.345763	0.104	0.028	0.044179	22.79581	0.118
2011	AIB	0.0381	-2.07831	0.52275	6.754427	0.114	0.181	0.049921	23.03738	0.129
2000	BOA	0.0421	0.731707	0.33402	4.903008	0.059	0.054	0.029248	20.39198	0.171
2001	BOA	0.032	0.693878	0.27343	5.61426	0.074	-0.003	0.039063	20.61345	0.164
2002	BOA	0.3795	-1.36879	0.47855	5.953267	0.016	-0.106	0.007005	20.85605	0.123
2003	BOA	0.2843	-1.26174	0.47119	1.12064	-0.021	0.109	0.006002	21.0107	0.112

2004	BOA	0.1751	-0.46632	0.49255	0.541248	0.117	0.073	0.034069	21.18385	0.122
2005	BOA	0.124	-1.02756	0.4665	0.216986	0.126	0.061	0.039864	21.44451	0.123
2006	BOA	0.0494	-0.1791	0.35875	0.220841	0.115	0.106	0.043049	21.76495	0.142
2007	BOA	0.1054	-0.15881	0.3756	0.601927	0.118	0.158	0.027974	21.94586	0.119
2008	BOA	0.1287	-1.46839	0.41482	2.528459	0.112	0.253	0.02983	22.17487	0.098
2009	BOA	0.1475	-3.22886	0.59995	5.816814	0.099	0.364	0.027574	22.42375	0.095
2010	BOA	0.0698	-2.70107	0.57639	9.345763	0.104	0.028	0.03121	22.56064	0.093
2011	BOA	0.0397	-3.45512	0.47667	6.754427	0.114	0.181	0.035449	22.70812	0.091
2000	WB	0.191	-0.14	0.63539	4.903008	0.059	0.054	0.013619	20.05773	0.097
2001	WB	0.1366	-0.82759	0.50334	5.61426	0.074	-0.003	0.024014	20.1837	0.099
2002	WB	0.1294	-1.01563	0.44272	5.953267	0.016	-0.106	0.018576	20.28631	0.099
2003	WB	0.1086	-0.23656	0.44602	1.12064	-0.021	0.109	0.016873	20.60561	0.105
2004	WB	0.1224	0.031008	0.46689	0.541248	0.117	0.073	0.039474	20.85429	0.113
2005	WB	0.0841	0.072222	0.48137	0.216986	0.126	0.061	0.038985	21.20322	0.111
2006	WB	0.0485	-0.0549	0.37177	0.220841	0.115	0.106	0.041611	21.53819	0.113
2007	WB	0.0525	0.095533	0.48467	0.601927	0.118	0.158	0.043966	21.9703	0.116
2008	WB	0.0839	-0.22048	0.60796	2.528459	0.112	0.253	0.046061	22.14033	0.147
2009	WB	0.077	-1.5676	0.78199	5.816814	0.099	0.364	0.05002	22.35603	0.163
2010	WB	0.0347	-0.22828	0.77387	9.345763	0.104	0.028	0.055381	22.47107	0.183
2011	WB	0.0351	-1.59095	0.69511	6.754427	0.114	0.181	0.056817	22.8103	0.166
2000	UB	0.0795	0.75	0.46053	4.903008	0.059	0.054	0.034965	18.77836	0.28
2001	UB	0.0775	0.460317	0.53488	5.61426	0.074	-0.003	0.037383	19.18149	0.294
2002	UB	0.1595	0.397727	0.75132	5.953267	0.016	-0.106	0.022293	19.5649	0.28
2003	UB	0.0993	0.725275	0.60279	1.12064	-0.021	0.109	0.014925	19.96611	0.194
2004	UB	0.099	0.333333	0.54511	0.541248	0.117	0.073	0.014837	20.32874	0.142
2005	UB	0.0845	-0.04	0.55954	0.216986	0.126	0.061	0.040075	20.79372	0.116
2006	UB	0.0418	-0.40838	0.48607	0.220841	0.115	0.106	0.037523	21.19264	0.119
2007	UB	0.0459	0.818056	0.49189	0.601927	0.118	0.158	0.039853	21.50397	0.165
2008	UB	0.0398	-0.48672	0.56714	2.528459	0.112	0.253	0.038769	21.90192	0.144

2009	UB	0.0462	-1.75669	0.68744	5.816814	0.099	0.364	0.028805	22.26056	0.112
2010	UB	0.0376	-2.41905	0.69309	9.345763	0.104	0.028	0.042062	22.49754	0.108
2011	UB	0.0335	-2.26381	0.58677	6.754427	0.114	0.181	0.041812	22.76773	0.117
2000	NIB	0.0000	0.875	1.11538	4.903008	0.059	0.054	0.02213	18.87811	0.253
2001	NIB	0.019	0.903226	0.44231	5.61426	0.074	-0.003	0.02898	19.79692	0.157
2002	NIB	0.0864	0.717172	0.48406	5.953267	0.016	-0.106	0.041199	20.09591	0.185
2003	NIB	0.1234	0.536	0.41497	1.12064	-0.021	0.109	0.021469	20.6011	0.141
2004	NIB	0.0877	0.554913	0.39784	0.541248	0.117	0.073	0.039294	20.94401	0.139
2005	NIB	0.1122	0.28125	0.37939	0.216986	0.126	0.061	0.038106	21.27254	0.129
2006	NIB	0.0847	0.610526	0.29959	0.220841	0.115	0.106	0.039961	21.42982	0.141
2007	NIB	0.0556	0.294118	0.37041	0.601927	0.118	0.158	0.04066	21.68147	0.163
2008	NIB	0.0673	-0.4323	0.53956	2.528459	0.112	0.253	0.043562	22.01799	0.164
2009	NIB	0.1116	-1.32457	0.70822	5.816814	0.099	0.364	0.045559	22.29334	0.152
2010	NIB	0.0737	-0.59211	0.74338	9.345763	0.104	0.028	0.047731	22.51018	0.153
2011	NIB	0.0504	-1.23079	0.70659	6.754427	0.114	0.181	0.048369	22.68505	0.165

Appendix-VI: Interview Instrument

Addis Ababa University

School of Business and Public Administration

Department of Accounting and Finance

Interview questions for the higher officials/finance managers of Ethiopian Commercial Banks

1. What are the financial risks that affect your banks‟ profitability?
2. How do those identified risks affect/influence your banks‟ profitability in general?
3. Among the identified factors that can influence your banks‟ profitability, which of them are the major factors which affect your banks‟ profitability?
4. What are the other factors contribute to the existence of poor or good performance of banks‟ when measured in terms of profitability?
5. Any comments?